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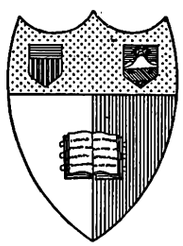

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Volume 71

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New York City

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Getting the Most from the Index

THIS is essentially a subject index, not an index of titles, and articles treating a number of different subjects are listed under each of them. In addition, a geographical reference is published wherever the article relates to any particular railway company, city, state or nation. Entries about an electric railway are under the name of the city in which the main office of the company is located.

In the subject index, the alphabetical method is followed. If there is a choice of two or three keywords the one most generally used has been selected, cross references being supplied. The headings which appear in the index itself are in small type under the general classifications. The main headings in capitals below do not appear in the index.

As an example of how to use the index, if a reader wishes to locate an article on special trackwork he obviously would look in the list below at the general subject "Track." Under this caption, only "Special trackwork" could apply to the article in question.

The large number of articles brought out on the monthly maintenance data sheets, together with the increasing number of maintenance notes in other issues has resulted in the substitution of three keywords, for indexing items formerly appearing under "Repair shop practice": (1) Maintenance data, under which all articles appearing on the monthly maintenance data sheets are grouped; (2) Maintenance equipment, with classified subheads, under which all articles in the weekly department "New Equipment" are included, and (3) Maintenance practice, also with classified subheads, under which all articles in the weekly department "Maintenance Notes," as well as the articles on the data sheets, are inserted. The heading "Repair Shops and Equipment" has been reserved for general articles on the design of repair shops and their equipment. Otherwise the plan used for many years in the preparation of this index has been followed.

In addition to the groups of articles covered by these headings, papers and reports from railway associations are grouped under the names of the various organizations. Proceedings of other associations and societies are indexed in general only in accordance with the subject discussed.

Signed articles also are indexed by the name of the author. When the name of the author is known to the reader this provides the simplest method of locating any article.

CLASSIFIED LIST OF KEYWORDS

ACCIDENTS AND ACCIDENT PREVENTION

Accident claim department
Accident prevention
Accidents (including wrecks)
Insurance, Fire
Safety work
Storm and fire damage

ELECTRIC CARS AND SERVICE CARS

Cars (including car design)
Locomotives
Service and tower trucks
Trackless trolley

CAR EQUIPMENT

Bearings
Brakes and compressors
Doors, car
Electrical equipment for cars (except motors)
Gears and pinions
Heaters, electric
Lighting and lighting fixtures
Motors, Electric
Resistors
Seats
Trolley wheels
Trucks
Wheels and axles

EMPLOYEES

Education
Employees
Insurance and pensions
Labor
Strikes and arbitrations
Wage decreases
Wage increases
Wages and working agreements

FARES

Fare collection (including apparatus)
Fare decreases
Fare increases
Fares
Traffic investigations
Traffic stimulation

FINANCIAL, LEGAL AND STATISTICS

Accounting
Appraisal of railway property
Blanks and forms
Discontinuance of lines
Financial (methods of financing)
Financial reports
Franchises
Insurance, Fire
Insurance and pensions
Legal
Legislation for railways
Market conditions
Operating records and costs
Public service and regulative commissions
Statistics
Taxes

HEAVY ELECTRIC TRACTION

Heavy electric traction (general)
Locomotives

MAINTENANCE OF EQUIPMENT

Car cleaning
Lubrication
Maintenance data
Maintenance equipment
Maintenance practice
Motor buses, Practice with
Painting
Repair shop practice; cars and car equipment
Repair shop practice; shop methods and equipment
Repair shops and equipment
Stores
Tests of materials and equipment
Welding

MOTOR BUSES

Motor buses, design
Motor buses, gas-electric
Motor buses, installations
Motor buses, jitney competition
Motor buses, Operating practice
Motor buses, regulation

POWER

Energy checking devices
Energy consumption
Fuels

POWER—Continued

Overhead contact system
Power distribution
Power generation
Power stations and equipment
Power transmission
Substations and equipment

STRUCTURES

Bridges
Carhouses and storage yards
Loading platforms
Power stations and equipment
Repair shops and equipment
Substations and equipment
Terminals and waiting stations

TRACK

Pavements
Rail joints and bonds
Rails
Special trackwork
Ties
Track construction
Track maintenance

TRAFFIC AND TRANSPORTATION

Advertising
Customer ownership
Dispatching
Freight and express
Interurban railways
Merchandising transportation
Parking of cars
Publicity
Public, Relations with
Rapid transit (elevated and subway)
Schedules and timetables
Signals
Street traffic congestion
Traffic investigations
Traffic regulation
Traffic stimulation
Transportation, Metropolitan (general studies)

MISCELLANEOUS

European practice
Management
Noise reduction
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Railways (general)
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Standardization
Wood preservation

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ELECTRIC RAILWAY JOURNAL

McGraw-Hill Publishing Company, Inc. JANUARY 7, 1928 Twenty Cents per Copy

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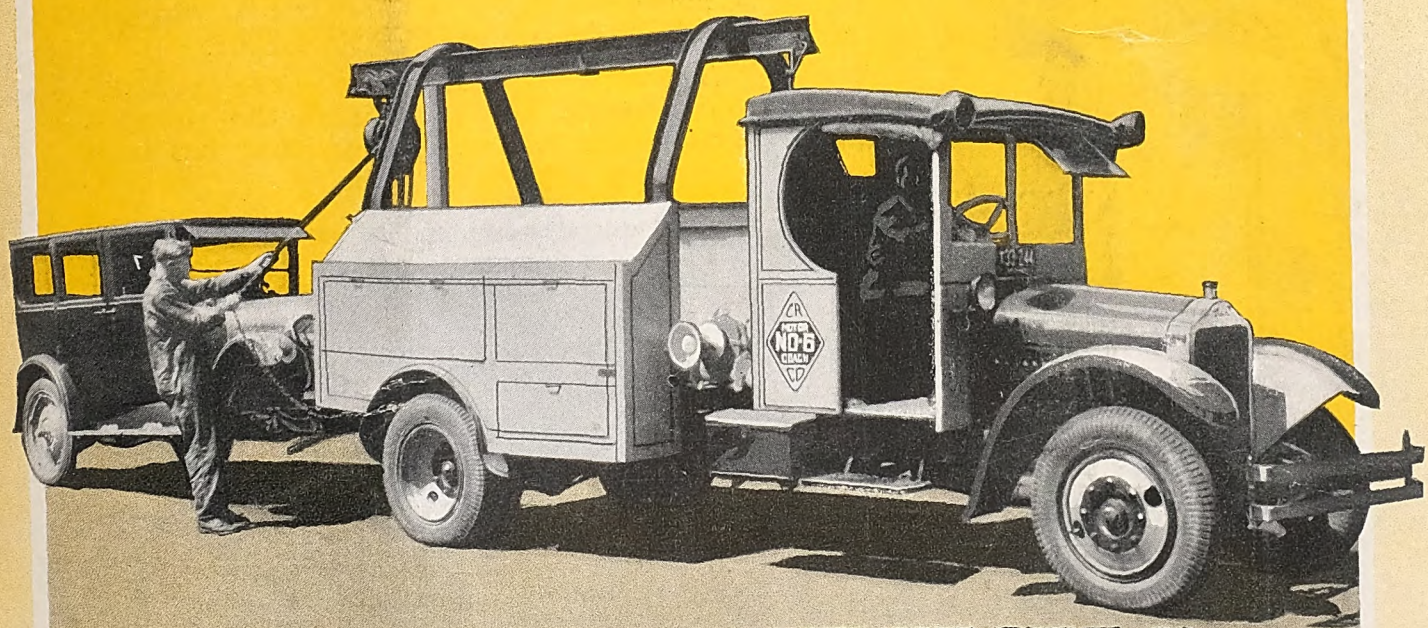

WHITE TRUCKS
AND WHITE BUSSES

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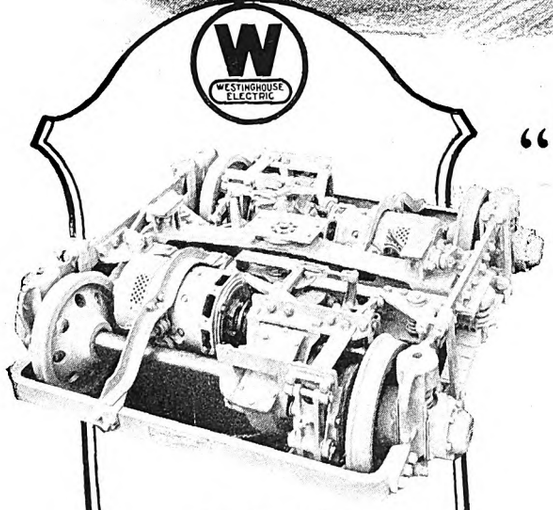

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Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review
Published by McGraw-Hill Publishing Company, Inc.
CHARLES GORDON, *Editor*

Volume 71 New York, Saturday, January 7, 1928 *Number 1*

ELECTRIC RAILWAY JOURNAL is a consolidation of *Street Railway Journal* and *Electric Railway Review,* effected in 1908.

In November, 1884, *Street Railway Journal* began publication, having been started a few months earlier as the street railway department of the *Journal of Railway Appliances.* The new paper was edited during various periods by Robert Grimshaw, George L. Fowler, Emerson P. Harris, C. B. Fairchild and Edward E. Higgins.

In May, 1908, *Electric Railway Review* was purchased and consolidated with *Street Railway Journal* to form ELECTRIC RAILWAY JOURNAL. Henry W. Blake, who joined the staff of *Street Railway Journal* in 1891 and in 1894 became its editor, continued as the editor of ELECTRIC RAILWAY JOURNAL until 1925, when he was made senior editor. Harold V. Bozell was co-editor from 1920 to 1922 and Harry L. Brown was co-editor from 1923 to January, 1925. Charles Gordon became editor in February, 1926.

The present staff is as follows: Editor, Charles Gordon; managing editor, Morris Buck; senior editor, Henry W. Blake; editorial staff, John A. Miller, Jr., Clarence W. Squier, George J. MacMurray, G. W. James, Jr., C. A. Faust and L. H. Church (Chicago). Paul Wooton is Washington correspondent and Alex. McCallum is London editorial representative.

A Demonstration of the Good Business of Good Service

AN ANALYSIS of the progressive program followed by the Georgia Power Company in its effort to give Atlanta "The Best in the Nation" in transportation service was published in last week's issue of the JOURNAL on page 1180. The opening paragraph of that article said:

> Confident that new cars and, therefore, better service are the real answer to increased revenue and the ultimate support of the public, the Georgia Power Company, Atlanta, Ga., and its predecessor company, the Georgia Railway & Power Company, have been buying cars steadily since 1921, in the face of a declining curve of earnings on the investment. Some idea of the extent to which the present company believes in better service is gained from the knowledge that it has spent over five million dollars in service improvements since 1921, and the budget for 1927 adds more than a million and a quarter dollars to that already invested.

It is an unusual coincidence that in the same issue of the JOURNAL, on page 1201, there is published an abstract of the opinion and order by the Georgia Public Service Commission granting the Atlanta company a fare schedule of 10 cents cash, four tickets for 30 cents, or twenty for $1.50. In support of this fare order the commission points out that the company is rendering the best railway service in its history. There was little organized opposition to the fare increase in the hearings before the commission.

Here, then, briefly is the history of what has been happening recently in Atlanta. It represents one of the brightest pages in the record of the march of electric railways toward better days. It is of more than passing interest, therefore, to look behind the record itself for the policy which has guided this company's management during the past several years. One does not need to look far. In the introduction to its brief filed last year in the Coffin competition the company sets down this policy under the heading, "Our Story at a Glance":

> A determined effort to give Atlanta the "Best in the Nation" in transportation service, in the confidence that this would win public patronage and support.
>
> Continuation of this policy for several years in spite of the fact that losses not only continued but increased—and then in 1926 an upturn in the curve of return on the investment!

That was Atlanta's creed. The management expressed and demonstrated its confidence that the public would patronize and support its service if the service was of sufficiently high quality to deserve patronage and support. It hung to this policy and continued to make large investments in new facilities over a period of several years, while losses not only continued but actually increased. It drew comfort at last from the fact that there was finally shown a slight increase in the return on the investment. But the recent commission order now demonstrates the soundness of the company's policy to the owners of its securities and to the industry in so convincing a manner that even the most skeptical and faint hearted must be convinced.

The JOURNAL extends its sincere congratulations to the Georgia Power Company. Atlanta enjoys no special advantages in comparison with other cities. What has been done there can be duplicated on many other properties. The Atlanta story portrays a brand of management courage and vision of which the electric railway industry can well use a large portion. Here is faith in the transportation business that serves as a shining beacon to those who have looked on the future with doubts and misgivings. Here is a demonstration of the good business of good service.

A $40,000,000 Program for the Boston Elevated

IF THE program of the Division of Metropolitan Planning of the Metropolitan District Commission at Boston is approved by the Legislature the status of the Boston Elevated Railway will be changed greatly. In the first place the division favors the expenditure of $40,000,000 for two new rapid transit lines and for the extension of the Washington Street rapid transit route. This is all presaged, of course, on the extension of the public control act. The division would extend the period of public control for fifteen years, but it would modify the terms.

Both of these matters were before the state legislative body in 1927. No disposition was made of them then, but enabling legislation has since been secured which is

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deemed advantageous under the present conditions. Moreover, the Supreme Court has decided that betterments may be assessed against property benefited by rapid transit line extensions.

Under the plan now advanced the name of the company would be changed to the Boston Transit Company so as to be more nearly indicative of the real status of the enterprise. The financial set-up of the company would be changed, with certain bonds carrying the guarantee of the state. Not the least interesting of these proposals is the suggestion that the three classes of preferred stock now outstanding be exchanged for 4 per cent income bonds, it being felt that a 4 per cent tax-free income bond with a guarantee of the commonwealth can be sold at par and offers a suitable medium of exchange for the holders of the various classes of preferred stocks. The investment plane to which the securities of the company have risen under the plan of operation by the trustees is attested by the market quotations, particularly of the first preferred stock, which is selling at 113.

So far as the company is concerned the changes suggested would save $1,175,000 a year on the basis of its present capitalization and earnings. The plan also provides for the liquidation of the $2,200,000 now owed by the Elevated to the cities and towns served by it and advanced through the commonwealth to the company to meet the guarantees of the public control act when its earnings were insufficient.

The plan, of course, is tentative. It may or may not be modified in its essentials. One thing it does do, however. It makes distinctly articulate the demand from some quarters that the essentials of the plan of operation which has been in effect for the last ten years be perpetuated.

But these ideas merely reflect the thought of one group of partisans. As a matter of fact, with regard to the control of the Boston Elevated property, three schools of opinion are coming to the front: (1) A group advocating the return of the property to private management under the commission regulation imposed upon other utilities; (2) a group seeking immediate public ownership of the road through purchase from the stockholders, and (3) an extension of the public control period under a plan which would probably require the stockholders to accept a lower dividend return than that guaranteed by the act of 1918.

Only a few days ago Eliot Wadsworth, formerly of Stone & Webster and latterly Assistant Secretary of the U. S. Treasury, issued a pamphlet in which he made out a strong case against the continuance of state trusteeship and vigorously advocated a return to private management. He pointed out that the property has been self-supporting for seven years; that it can and should be run in the future on the principle of service-at-cost, and that this can be done without further commitment of the state treasury to making up operating deficits, which amounts to giving the trustees an unlimited expense account through their right to levy taxes on the metropolitan district.

Mr. Wadsworth maintains that the need of the public control act of 1918, passed under war conditions, has long since vanished; that the trustee plan has failed as a method of money raising, and that much-needed extensions of the Boston subway system are practically impossible under existing conditions. The improvement of service under public trusteeship has been largely due to the establishment of adequate rates, and it is held that under private management and state regulation progress will be even greater. It is declared that a continuance of trusteeship threatens private management of utilities and is obnoxious to the broad principles of businesslike administration which are associated with utility development in this country.

His is a point of view that it is not easy to dismiss. After all, belief in the policy of private development under commission regulation is general. There is little doubt that the administration of the Boston electric and bus transportation system under the act of 1918 has been unusually high-minded and public spirited; that without a radical increase in rates, and perhaps also without the use of the public credit, financial disaster would have overtaken the property. Fundamentally, of course, public management is open to objections of the gravest character from the standpoint of American institutions. One thing Mr. Wadsworth has done. He has made articulate the demand of those who seek the restoration of a program designed to give the fullest scope to private enterprise accompanied by the long-established safeguards of commission regulation in the field of public utility development.

Mercury-Arc Rectifier Gives a Good Account of Itself

DATA on operation of a mercury-arc rectifier installed on the Chicago, North Shore & Milwaukee Railroad have now been obtained over a period of several months. In general they indicate that in several respects this device is superior to the synchronous converter. The data, which were obtained by Caesar Antoniono, electrical engineer of the company, are included in an article by him appearing in this issue.

The advantages given by the author include high efficiency, simplicity of operation, low maintenance cost, reliability of service, high capacity to absorb momentary overloads, freedom from noise and vibration in operation, insensibility to short circuits and absence of synchronizing. The statements made in the article are based on actual experience over a period of five months of automatic operation following about a year while the station was operated manually. The conditions imposed on the rectifier were similar to those imposed on the five synchronous converters with which it has been compared.

The high efficiency obtained is particularly important in view of the low load factor. For the five synchronous converters the grand average efficiency was 73.4 per cent, while for the rectifier it was 81.7 per cent, a gain of 8.3 per cent. The author believes the comparison is fair, even though it was not exactly correct on account of exclusion of power consumed by the automatic devices.

More auxiliary devices are used with the rectifier than with the converter. Even so, the experience on the North Shore Line is that the rectifier is simpler to operate and has required less attention than the converters. Brushes, commutators and slip rings, which usually require attention, are absent, and the ventilation is simpler. No maintenance cost data are available for the installation, but it is the belief of the operators that this item will be less than for the converter. The only maintenance so far has been the regular weekly inspection and oiling.

As to reliability, Mr. Antoniono stated that the automatic rectifier station is as reliable as the average 60-cycle converter station of like capacity, or more so. This is supported by records of shut-downs over a period of

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twelve months while the rectifier was attended and five months since it was made automatic. During this period the rectifier was out of service for trouble inherent to itself only 0.435 per cent of the total time. It is quite a commentary on reliability that failures of auxiliaries caused a loss of 0.674 per cent of the total time. Many of these, such as a chain break or a motor burnout, might have been avoided. Of course, the auxiliaries were neglected during the period of the test, for the operator's attention was directed principally to the rectifier itself. A study of the records obtained with a synchronous converter of similar rating indicates that the troubles with the rectifier itself probably will be less serious than those of a modern converter. Flashovers, which are likely to cause extensive repairs in the converter, are entirely absent.

It is significant to note that the author has great confidence in the converter. He predicts that it is here to stay and in ten or fifteen years will have a large use supplementing the converter. This prediction will bear watching by every power engineer.

Lighter Overhead Favored in Europe

BUILDERS of heavy current collection systems in the United States will find much to interest them in a study of light overhead, supporting structures and pantographs employing low pressures. The extensive use of light overhead in Europe, as described in an article appearing elsewhere in this issue, has been prompted by the many advantages the operators there find for it.

Lower original cost and lower maintenance cost effected by the lighter construction are the two main advantages held. Since from 25 to 35 per cent of the total cost of electrifying a railroad is in building the overhead system, any reduction in the cost of this important element would be a substantial saving.

Maintenance costs of both the overhead and the pantograph, at least under European conditions, has been found less with the use of a lighter system. The lower pressures necessary reduce the wear of the contact shoe materially. Likewise, the wear on the overhead conductors is reduced.

Use of an auxiliary bow on the pantograph to support the contact shoe is another European practice that has proved a success. The bow, being flexible and swinging through a short arc, easily follows minor irregularities of elevation in the contact wire. In turn, this permits the use of lower pressures in the main pantograph. In America the type of pantograph generally used has a heavy framework, with the collecting shoe hinged directly to it. Heavy pressure is essential, as the entire weight must follow even the slightest irregularities in order to maintain contact. Because of the high inertia of the heavy framework, where there is any irregularity in the contact wire the proponents of the European system believe that collection is not as uniform as with the lighter pantograph using an auxiliary bow.

With high pressures harder contact shoes are needed to prevent excessive wear, and in turn these hard shoes and the high pressures jointly cause excessive wear on the contact wire. Heavy pantographs also must have sturdy pin joints. If these are loosely fitted to reduce friction, there is side swaying and a consequent reduction in the effective width of the shoe. If they are tightly fitted, there is a considerable added load and reduced flexibility.

Even without auxiliary bows the lighter pantographs have proved more satisfactory in Europe than the heavy ones. The use of roller bearings makes the whole structure very flexible and permits good collection. Operators in Germany, Austria and Switzerland even find it unnecessary to use intermediate trolley wires to give flexibility. Just as the heavier overhead for the collection of high-voltage alternating current is favored in America, so is the lighter construction favored in Europe.

Novel Advertising Ways Attract Business

MANY years ago a railway manager said he did not see any reason for advertising street railway service. He considered that as street cars are very conspicuous objects on the street, they are their own best advertisements and need no other. This remark was made when the need of the utilities for publicity was not as well understood as at present. Now, with more competition than ever before, railways realize the necessity not only of advertising the advantages of car riding over other means of transit but also of explaining to the public at large some of the special problems of the electric railway business. Hence, notes on advertising campaigns which have gained results are worth while.

Such a campaign has been conducted for several years by the Birmingham, Ala., electric railway system, a feature of whose advertising is the extent to which it is carried on the cars themselves. Other mediums are used, of course, such as the daily papers, moving pictures, signboards and even, to some extent at least, direct solicitation. But the railway takes its own medicine by advertising extensively on the cars themselves. In the opinion of the company this is the most effective of all.

As explained in an article elsewhere in this issue, the spaces thus taken are not those which are utilized for the usual commercial car cards. In fact, the cards are in space which ordinarily would not be so used, such as the deck windows.

These window and dash signs might appear obtrusive if employed for commercial advertising. But when they are used to carry some good will or safety message or traffic announcement of the company no one can object. This plan also permits all of the usual spaces for commercial cards to be used for that purpose. It does not cut down the revenue of the company. It also separates the advertising done by the company from that done for its clients, the car card advertisers.

The practice of direct solicitation for car riding followed in Birmingham is even more rare. It is employed, of course, by the central station light and power companies, but is usually considered not worth while in railway work as the amount charged for a car ride is very small compared to that paid for an electrical installation. This objection may hold for regular solicitation. It does not apply where the business of an entire family can be won by a single call. With several members in the family, its carfares for a month might easily be greater than its electric light bill for the same period.

This is the warrant for a personal call in railway solicitation when a new line or service is begun. It is also sufficiently novel to attract attention. Strange, indeed would it be if the interest of the railway in the transportation business of the family visited did not result in comment favorable to the management.

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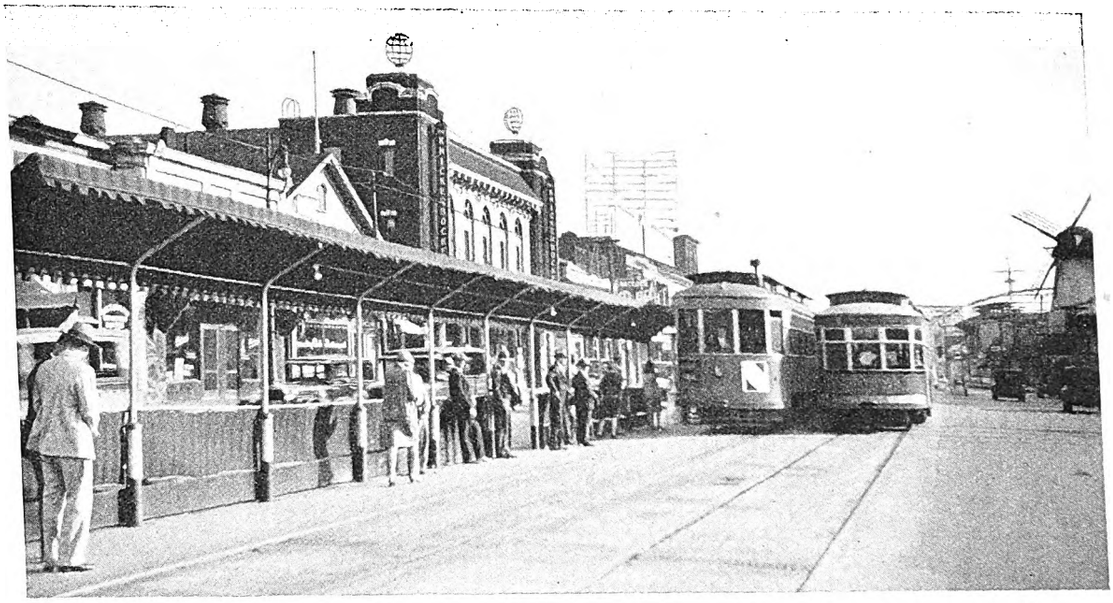

Two-car express train approaching station on Jefferson Avenue surface rapid transit line in Detroit

Surface Rapid Transit Line

Operated in Detroit

Street cars on Jefferson Avenue give 18 m.p.h. service by running express with stops nearly mile apart. Local service provided with supplementary buses. All traffic on street expedited by elimination of frequent car stops

MORE than three months of experience with an experimental line on Jefferson Avenue, Detroit, indicates interesting possibilities in the idea of combination express and local transportation service with cars and buses on city streets as a means of providing rapid transit without the heavy investment required for subway or elevated line construction. The Detroit experiment is an attempt to increase the speed and efficiency of surface transportation on a heavy traffic artery by running street cars on an express schedule of more than 18 m.p.h., making only five stops in a distance of 4.15 miles. Buses handle the passenger traffic originating and terminating at intermediate street intersections. Free transfers between the two vehicles enable passengers to use the combined service of cars and buses from their point of origin to destination, much as they would use the express-local service on a four-track rapid transit line.

Jefferson Avenue in Detroit is a main traffic artery running in a north and east direction from the business district. It is approximately 7 miles in length from its downtown terminal to the outer end of the car line. The average width of the street in the express zone is about 90 ft. from curb to curb. Repair work and other obstructions, however, narrow this pavement in some sections to 60 ft. Prior to the introduction of the present express service, the cars running on Jefferson Avenue made about six stops to the mile outside the business district. The average schedule speed on the line was less than 12 m.p.h.

Speed Over 18 M.P.H.

Express operation commenced on Sept. 18 with the inauguration of a schedule which calls for an average speed of 18.4 m.p.h. in the express zone. Beginning at the city's limit, the end of the line, the street cars are operated on a local schedule for the first 1.89 miles, with actual stops averaging about three blocks apart. Inbound toward the business district the express zone following this local section is 4.15 miles long and is covered by the cars in 13½ minutes. The former running time for this section of the line was 20½ minutes. The remaining 0.7 miles of the one-way mileage is half of a loop in the downtown congested section and requires about seven minutes running time on the base schedule.

Car stops in the express area are spaced from 0.53 miles to 1.16 miles apart. This gives five runs with an average length of run of about 0.83 miles between express stops. The express zone speed of more than 18 m.p.h. is maintained easily even during the rush hours of the day. The average all-day speed for the entire line, including the local running beyond the express zone and in the congested business district, is approximately 14 m.p.h. This is being accomplished with two-car, motor-

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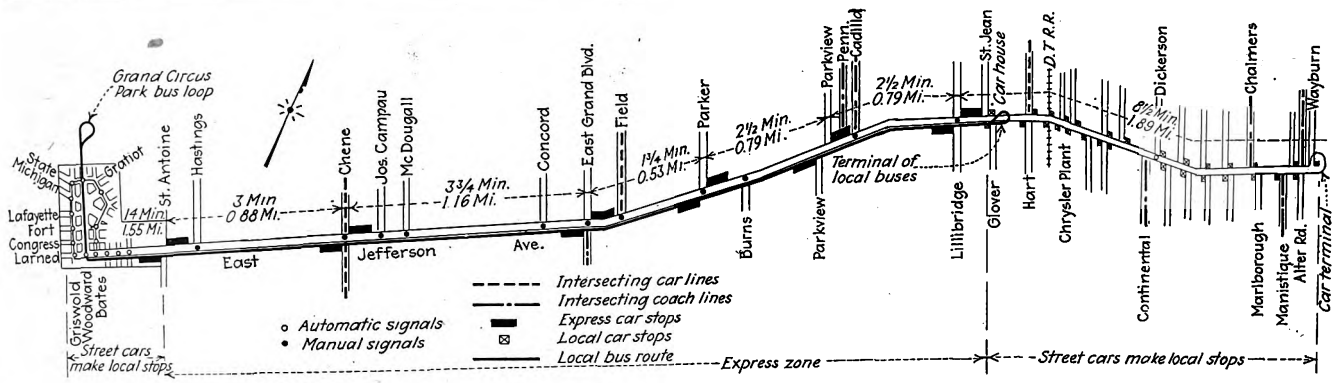


Map of **Jefferson Avenue express line showing location of stops and signals. The local buses terminate at the end of the express zone at Glover Street**

trailer trains, using old equipment not designed for this class of service. The time saved by the introduction of the express service is between seven and eight minutes for the trip each way.

Jefferson Avenue is treated as a preferred traffic street. At the present time traffic signals at intersections are operated by hand. The signal for cross traffic is given just as a train comes into an express stop, and the clear signal is thrown when the train is ready to proceed. At intermediate intersections, between express stations, the crossing signals are operated so as to permit the express trains to move through without interruption. Experience has shown that this plan, while seeming to favor the movement of cars without regard to other traffic, actually expedites the movement of all traffic on the street. It is recognized, of course, that the plan of operating signals by hand is merely temporary, and studies are now being made to determine the best system of automatic signals for use with this express operation. It is probable that a "wave-control" system will be ultimately installed.

Buses Give Local Service

Dodge-Graham 21-passenger buses give a local service on the same street with the car line between the downtown business district and the last outbound express stop at Lillibridge Street. This makes the outer terminus of the local bus line approximately 1.8 miles from the extreme end of the car line, as shown on the accompanying map of the route. The local buses pick up passengers between express stops, or carry them to local stops after they have transferred from express cars.

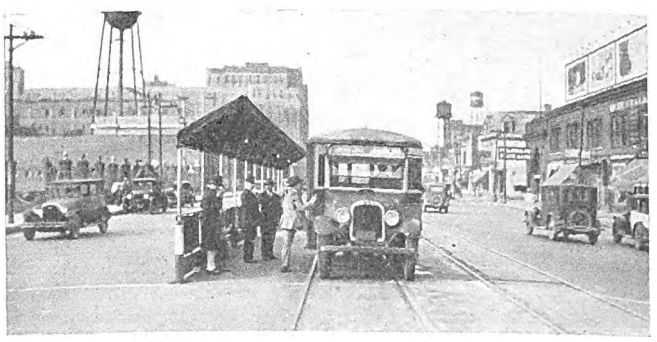
Experience on the line gives several interesting facts regarding the preferences and riding characteristics of the passengers carried. Approximately 10 per cent of the total car passengers use the combined service. This indicates, therefore, that the number of buses required to provide the supplemental local service is only a small proportion of the number required if all car passengers transferred to a bus to reach their destination. Approximately 50 per cent of the total passengers picked up by the local buses transfer to the express cars. The other 50 per cent of those carried by the buses either originate so close to the business district that they complete their journey on the local bus without bothering to transfer to the express cars, or both their origin and destination points are at local stops and the time saving offered by the express cars is not sufficient to offset the inconvenience of transferring from bus to car and from car back to bus.

Passenger volume on the Jefferson Avenue line on Monday, the peak day of the week, checked over a period of seven weeks, is approximately 37,200 revenue passengers per day. This gives an approximate idea of the density of the line. The base car service is supplied with fifteen single cars operating on four-minute headway. Running time in the base from the end of the line to the downtown terminal is 30 minutes inbound and 28 minutes outbound, with a two-minute layover. During the rush hours express service is provided with two-car trains operating on two-minute headways. Twenty-seven such two-car units are operated during the rush period. The express service is given between 5 a.m. and 9 p.m. Outside of these hours the coaches are taken off and the entire service on the street is supplied with street cars, making all local stops.

Makes Large Reduction in Cars Required

In comparison with the former local service on this line before the express experiment was started six trains have been taken off in the rush hours and four cars less are operated during the base period, to give the same headway as was formerly provided. The supplementary local bus service, during the period of express operation,

Local buses pick up and discharge passengers at the curb between express stops on the rapid transit car line



Buses run inside safety zones at express stops to provide convenient transfer to and from cars

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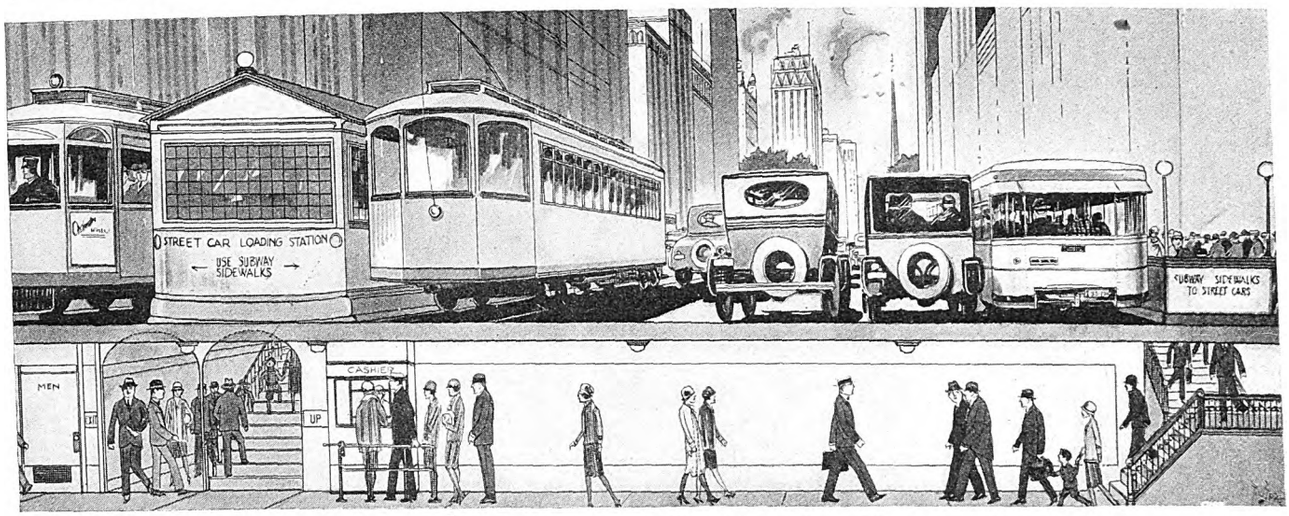

Sketch showing proposed arrangement of street for Miller-Schorn plan, with center loading platforms and sub-surface cross passages

is given with 34 21-passenger Dodge-Graham buses. These buses operate from the outer express terminal and loop down through the congested business district, as shown on the accompanying map of the route. The average schedule speed on the local buses is approximately 9.94 m.p.h. A total of 3,204 coach-miles per day, or 388 coach-hours per day, are operated to provide the supplementary local service.

Protected Safety Zones at Express Stops

Safety zones at the express stops are of the type previously standard in Detroit, using protecting pipe railings. The zones are 88 ft. long, with upright stanchions erected 6½ ft. from the track and spaced about 8 ft. apart. To afford shelter for passengers transferring between local buses and express cars, canvas awnings over the safety zones and splash guards around the sides have been erected.

Local buses pick up and discharge passengers at the curb. When arriving at an express stop, these buses run inside the safety zone either ahead or behind an express train, so as to avoid the necessity for transfer passengers to cross the traffic stream on foot between the curb and the loading platform. This arrangement was adopted temporarily as a means of trying out the express scheme without undertaking costly construction work to provide more permanent loading facilities at express stops. If the plan is ultimately declared entirely successful, adoption of the Miller-Schorn arrangement of express loading stations between the tracks in the middle of the street connected to the curb with pedestrian under-passes is contemplated. This, it is claimed, would take up less street area than the present outside loading platforms on each side of the double-track line, but would require cars to be arranged for left-hand loading. If the Miller-Schorn plan is adopted, local buses would then discharge and pick up passengers at the curb line at express stations just as they do at local stops, the transfer to the loading platforms being made through pedestrian under-passes, as illustrated in an accompanying cross-section sketch of the proposed arrangement.

Unfortunately, for purposes of analysis, a number of variable and special conditions on the Jefferson Avenue line make it impossible to determine from study of the present service the feasibility of this express-local scheme for use on other heavy traffic streets in Detroit or other cities. Before the express plan was put into operation the Jefferson Avenue line was part of a through route extending through the business district and out on Grand River Avenue, northwest from the center of the city. Simultaneously with the inauguration of the new service, the through route was cut in the business district, and through passengers are required to transfer at that point. This made a considerable difference in the travel habits on the line, and as a result it is almost impossible to get a direct comparison of costs and riding, to determine comparative operating costs and revenues in relation to

JEFFERSON AVENUE—LOCAL BUS OPERATION

Terminal to terminal	Distance, 4.8 miles; time, 27 minutes; speed, 10.67 m.p.h.
Total bus-miles	2790.15
Schedule	Bus-hours, 261.43. Speed, 10.65 m.p.h.
Payroll	Bus-hours, 268.39. Speed, 10.37 m.p.h.
Number of buses required:	
Base, fourteen	
P. M. rush, 30 single deck, one double deck.	
Spares, three.	
Platform cost per bus mile	$0.072

JEFFERSON EXPRESS SERVICE COMPARED TO PREVIOUS OPERATION

Service	From	To	Street Cars Distance	Time Former	Time Present	Speed Former	Speed Present
Local	Wayburn	Lillibridge	1.89	9½	8½	11.90	13.34
Express	Lillibridge	St. Antoine	4.15	20½	13½	12.14	18.40
Local	St. Antoine	State and Griswold	.72	8	8	7.20	7.20
Local and express	Wayburn	St. Antoine	6.04	30	22	12.08	16.47
Local, express and local	Wayburn	State and Woodward	6.76	38	30	10.67	13.52

	Former	Present
Total pay time speed	10.43	11.67
Platform cost per mile	$0.1250	$0.1111*
Cars saved	Base—4 P.M.—12	
Service base	Four minutes, single cars. Peak two minutes trains.	

* Includes 30 men per day used temporarily for extra station service and signal operation.

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the old service. A further complication is produced by the fact that the Department of Street Railways formerly operated on Jefferson Avenue a double-deck 10-cent bus service, which has now been replaced with the small single-deck buses providing the local service for the express line and carrying passengers at 6 cents, the regular car fare, with transfers to and from the express cars.

Independent Buses and Jitneys Compete With Line

Two independent competing transportation services are also operating on Jefferson Avenue. Double-deck buses of the Detroit Motor Bus Company on this street give a 10-cent service similar to that formerly provided by the Department of Street Railways. In addition, the street is infested with jitneys operated by private individuals. The combination of these two competitive services hopelessly complicates the problem of determining just how much the faster car service may be expected to attract automobile owners to use the lines in preference to their personal cars.

During the experimental period normal traffic conditions have been considerably disturbed by extensive repair work on the street. Furthermore, the car equipment used for express operation includes some of the older equipment owned by the Department of Street Railways. Two-car trains consist of motor cars and trailers. This equipment does not develop the full possibilities of this service from the standpoint of speed, frequency or attractiveness to passengers.

Still another special condition, the nature and location of Jefferson Avenue as a traffic artery, interposes a difficulty in determining the feasibility of the express idea on typical surface trunk line streets. This street adjoins and parallels the Detroit River throughout the greater portion of the express zone. Very few intersecting streets cut through to the river and the problem of cross traffic is thereby largely eliminated.

Offers Attractive Possibilities for Faster Transportation

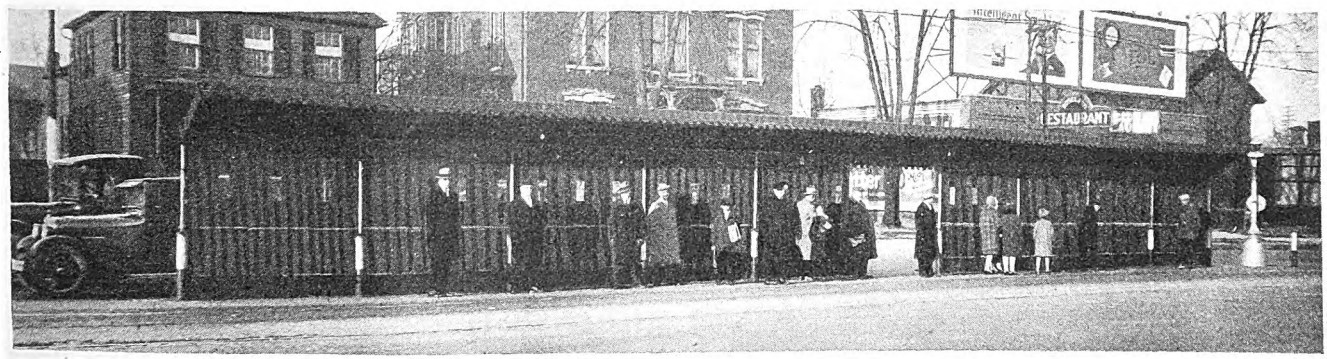
Despite the several special conditions found on this line, which make the Detroit experiment far from conclusive, and which also make it difficult to determine the possibility of applying this express-local idea to other heavy traffic arteries either in Detroit or other cities, the idea seems to offer attractive possibilities. To obtain full advantage of the express-local system in the way of expediting service, a system of subway dips in the heart of the business district is considered a logical ultimate step.

One of the principal difficulties which attended the inauguration of the new service was the handling of crowds from several factories along the line. This situation was met by placing a number of "stand-by" buses at strategic points along the line to be used for the accommodation of these industrial employees during the peak period.

When the service was inaugurated guards were stationed at all of the express stops to expedite the interchange of passengers to and from the express and local units and to explain the details of the plan. Men in scout cars patrolled the express area to inform passengers of the boarding points for the new service. A number of the station guards are still retained during the rush hours.

Service Popular With Public

On the whole, the service has proved popular with the riding public The operation is at present carried on with little confusion. Comment by the press and the public has recognized the experimental nature of the present installation and has, on the whole, been quite favorable. There has been a notable reduction in traffic congestion on Jefferson Avenue resulting from the elimination of car stops. Although the total volume of vehicular traffic has increased considerably due to the speed with which the traffic stream moves on this street, there is little congestion, due to the fact that the express cars move along at the same rate as other traffic.



Canvas awnings furnish protection for waiting passengers at express stops

Signal Experiments Being Conducted on Street

In an effort to work out a plan of signal control which will avoid interference with the movement of express cars, while at the same time eliminating hand operation of crossing signals, experiments are being conducted with an automatic signal at Burns Street, in which the customary time-controlled signal is wired to a trolley contactor so that it will be thrown to clear the express line on the approach of a train and will return to automatic time-controlled operation when the train has passed the crossing. The conditions obtaining on the Jefferson Avenue line, however, are special, as it has comparatively little cross traffic. For this reason it will be difficult to determine the applicability of any control scheme adopted here to lines on other thoroughfares having heavy cross traffic.

One tendency which has been observed as a result of the expedited car service is that of passengers who drive private automobiles to express stops and leave them parked near by while they continue their journey to the business district by street car.

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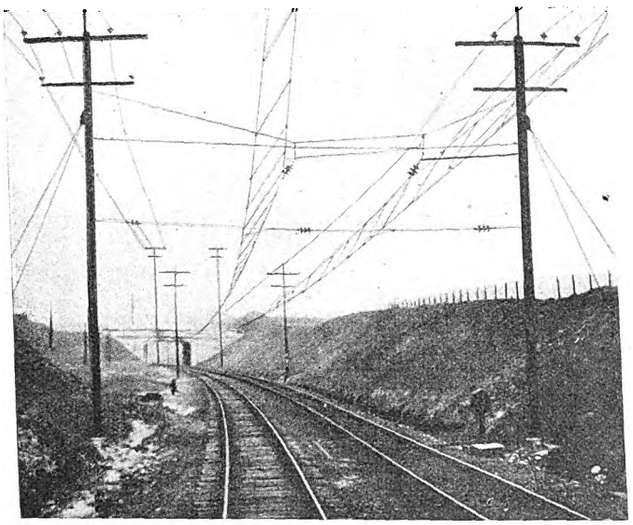
Light Construction

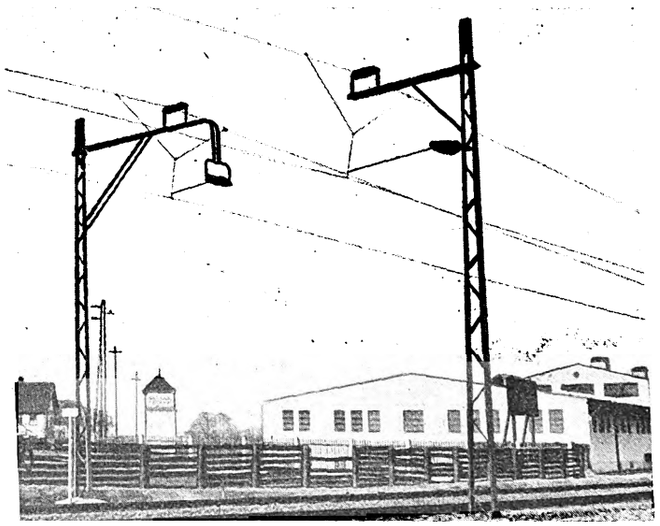
Features European Overhead

By use of pantographs of light weight and low inertia with hinged shoes a much cheaper type of overhead and supporting structures is used than is practicable with heavy pantographs

By Kent T. Healy
Consulting Engineer, Natick, Mass.



Two-track main line catenary and supports on the New York Connecting Railroad



Old style insulators are used on this German overhead system

CATENARY and pantographs in use on the various high-voltage alternating-current railroad electrifications of the world are of two very distinct types. These differ not only in the design but also in the cost of construction and maintenance. The first uses a heavy pantograph requiring a high pressure on the contact wire with resulting heavy catenary construction and heavy structures to support the overhead. The second type employs a light pantograph with an arrangement to give the contact shoe low inertia so the pressure against the contact wire will not have to be very heavy. This permits the use of a light flexible catenary system and lighter supporting structures.

The high-pressure pantograph design for high-voltage alternating-current distribution is found alone in America. Usually the pantograph for this system has a pipe frame with two pieces for each lower leg, a single upper leg and side cross braces for the upper section. Until recently all the joints were of the pin type, but now roller bearings have been introduced at the base joints. The sliding shoe is an integral part of the structure so that any movement of the shoe to follow irregularities in the elevation of the contact system causes a corresponding movement of the whole pantograph structure. This gives the contact shoe a high effective inertia and makes it slow to follow trolley irregularities unless the pressure pushing it up is high. The high pressures demand a hard shoe to prevent excessive shoe wear, but this causes considerable wear on the contact wire. The pin type of joint requires a certain amount of play to keep the friction down and side swaying of the pantograph results. This, in turn, reduces the effective width of the contact shoe for safe use and necessitates accurate alignment of the catenary or else more trouble from the pantograph leaving the contact system will result. The pin joint is inefficient and the resulting friction may add as much as 6 lb. to the pressure of the raising springs.

Lighter Pantographs Have Independent Shoe Supports

A much lighter pantograph is used on the European high-voltage alternating-current electrifications. Both its lower and upper legs are made of pipe with a cross bracing either of wire or pipe. A feature of the European type is the independent support for the contact shoe. This support is in the shape of a bow and extends approximately 1 ft. above the main body of the pantograph. It is free to rotate about the axis of the upper cross rod and normally is held in a vertical position by small springs. When in motion, mechanical resistance against the trolley tends to make the shoe move about its axis so that the bow is not vertical, but on a slant. In this

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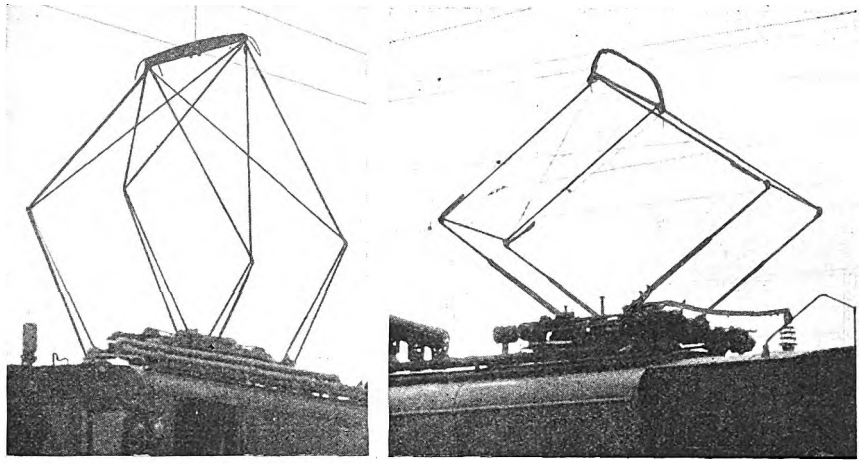
position any minor irregularity in the height of the trolley is taken up by the rotation of the shoe and its bow about the axis. The resulting inertia is almost negligible as far as movements are concerned, since the inertia is dependent only on the weight of the bow and shoe and the resistance of a single joint. Consequently, constant contact with the trolley at high speed can be maintained without sparking. Also, a high pressure to overcome the high inertia of the whole pantograph in following small changes in trolley height is not required.

Wear on the trolley with the lower pantograph pressure is negligible and trolley renewals are infrequent. Larger variations in trolley height are taken care of, as usual, with the main body of the pantograph, in which movement is made freer by use of roller bearings and lighter weight.

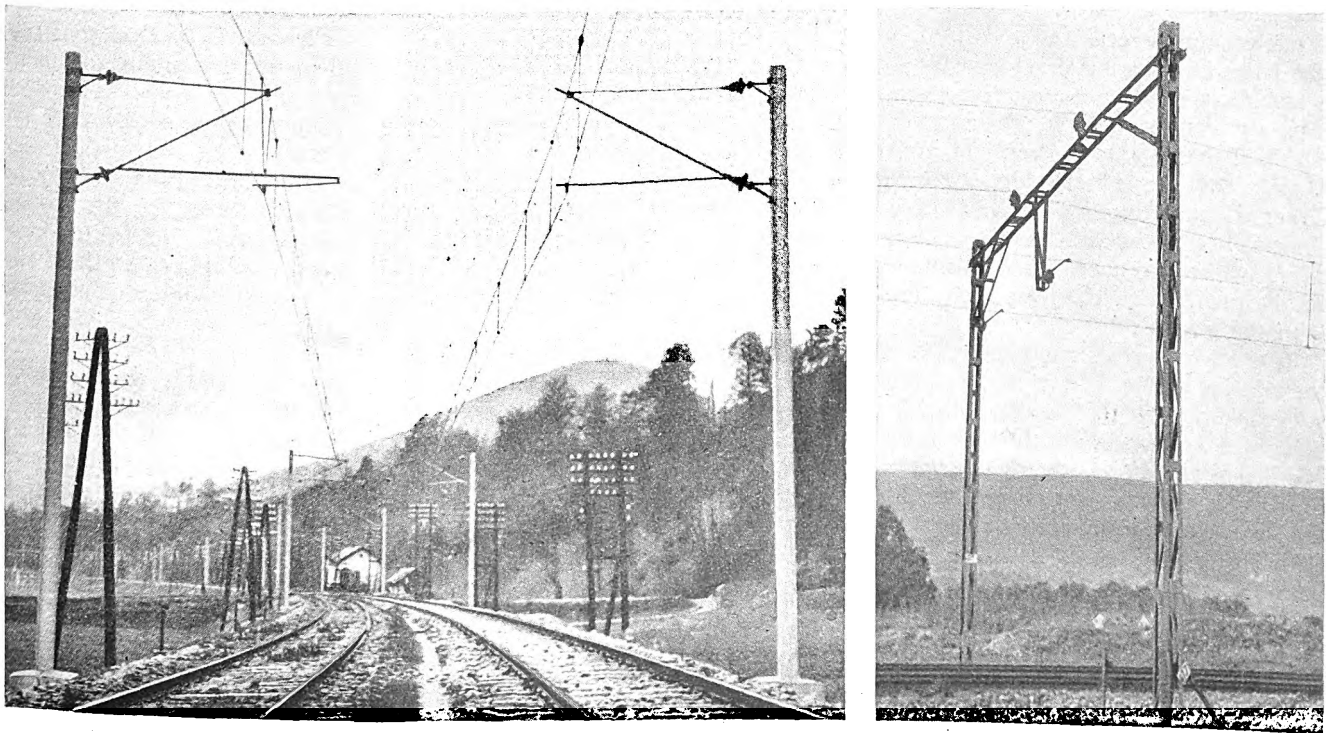


At left, high-pressure pantographs of this type are in use in America. At right, a typical European high-voltage pantograph with low pressure on the trolley. Note the bow supporting the contact shoe

Operators in Switzerland have succeeded in collecting 180 amp. at 55 m.p.h. with one aluminum shoe and without sparking. At 27 m.p.h. they have collected 250 amp. The contact pressures vary between 6 and 9 lb. Tests have shown that using two pantographs not only insures sparkless collection but also that the life of the shoes is nearly doubled. With a single shoe the life is about 3,100 miles and with a double shoe 5,600 miles on an average. This indicates that the reduced current density and sparking decrease the wear on the shoe and the contact wire as well. In Switzerland the wear on the trolley wire has been found to be negligible. This experience seems to be typical of all the other systems of this type in Germany, Austria and Sweden.

The main advantage in the use of lighter pantograph pressure is not that of decreasing wear on the contact line and shoe, but the reduction in weight of the entire overhead system. Because the distribution system may cost from 25 per cent to 35 per cent of the total cost of the electrification, the reduction effected by using lighter overhead is substantial. Designers of the high-pressure pantograph system are tending to make the catenary heavier with the addition of intermediate trolley wires, demanding larger supporting stretches. Additional wires may be needed for a direct-current overhead system, but not for a normal high-voltage alternating-current system. Designers of the low-pressure pantograph system are abandoning the complex forms of catenary and adopting simple, flexible suspension with a messenger and a single contact wire. Operators in Germany, Austria and Switzerland have tried an intermediate trolley wire to give flexibility and have decided that it is unnecessary with their type of collecting apparatus. In Sweden also the simpler types of catenary are used. Detailed characteristics of the design described are shown in the accompanying table.

Other characteristics of the lighter catenary design are of interest. All contact wires are given a zigzag



At left, standard catenary construction on an Austrian main line. The steel I-beam supports are set in concrete. At right, simplicity and sturdiness characterize this Swiss overhead

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DETAILS OF CATENARY DESIGN FOR NORMAL HIGH-VOLTAGE ALTERNATING-CURRENT DISTRIBUTION SYSTEM

Name of Railroad	Voltage	Messenger	Auxiliary	Contact Line	Tangent Hangers	Spans, Ft.	Loading	Pantograph Pressure
Swiss Federal.....	15,000	50 sq.mm. ⅜ in. galv. steel	.....	107 sq.mm. 0000 copper 1,100 lb. tension	4 mm. 5/32 in. copper and steel spacing 32 ft.	200 and 330	14 lb. wind per sq.ft. 5.3 lb. ice per ft. catenary	6 to 7 lb.
German State.....	15,000	50 sq.mm. ⅜ in. galv. steel, copper clad steel or bronze	.....	100 sq.mm. 0000 copper	10 sq.mm. 3/16 in. bronze strand spacing 35 ft.	250 and 480	69 m.p.h. wind 0.81 lb. ice per ft. catenary	7 to 9 lb.
Austrian Federated...	15,000	65 sq.mm. 7/16 in. 1,320 lb. tension galvanized steel	.....	100 sq.mm. 0000 copper 1,320 lb. tension	.....	200	.....	7 lb.
Swedish State.....	16,000	50 sq.mm. ⅜ in. 880 lb. tension copper	.....	80 sq.mm. 000 copper 1,320 lb. tension	Spacing 32 ft.	200	.....	7 lb.
New York, New Haven & Hartford and New York, Westchester & Boston.	11,000	9/16 in. galvanized stee	0000 Copper 1,000 lb. tension	0000 phono 3,000 lb. tension	½ steel rod spacing 15 ft.	250	71 m.p.h. wind 8 lb. wind per sq.ft. ½ in. sleet 2 lb. ice per ft. catenary	14 to 20 lb.
New York Connecting	11,000	½ in. extra high strength phono	0000 copper	0000 phono	¼ in. phono rod spacing 30 ft.	300	Same	14 to 20 lb

alignment from pole to pole instead of being in a straight line, to distribute the wear on the pantograph. This requires a steady brace at each pole. Since these are also necessary for wind bracing in tangent sections no additional expense is involved. The effect of wind forces has been considered more by European operators and it is the determining factor in the spacing of poles for horizontal support in tangent sections. For instance, the Germans in determining the general standards for catenary construction on all their lines determined the maximum distance between supports to be about 250 ft. for a wind velocity of 69 m.p.h. and an allowable variation of 2¼ ft. from the center line of the track. In curved sections the tangent construction is continued as a series of chords within the limits of the alignment used for the zigzag arrangement, which varies from 17 to 24 in. In both Switzerland and Germany some longer spans of 330 ft. and 480 ft. are in use with intermediate horizontal bracing poles.

Pico Street Viaduct Dedicated

DEDICATED with fitting ceremonies last month, the new 1,007-ft. Pico Street viaduct in Los Angeles, Cal., erected at a cost of $306,000, embodies the latest engineering developments and does away with a hazardous grade crossing. The event, sponsored by the city, the county and the Pacific Electric Railway, was presided over by Vice-President and General Manager D. W. Pontius. Brief addresses were made by Mayor Cryer, County Supervisor Graves and David R. Faries, chairman Los Angeles County grade crossing committee. Mr. Pontius introduced the speakers, gave a brief history of the project and cited facts and figures in connection with the structure.

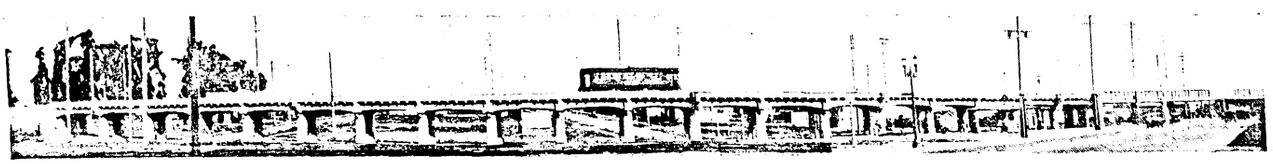
The Mayor called attention to the speed of erection, the massive girders and concrete piers having been placed so expeditiously that traffic on Pico Boulevard was delayed less than eight hours. The Mayor, Messrs. McClellan and Faries then participated in the ceremony of driving three golden spikes at the point where the final work marking the official completion of the structure was staged, after which the large number of persons who had witnessed the exercises were conducted on a tour of inspection under the structure. To demonstrate the lack of noise and absence of rumbling, a train traveling at high speed was operated over the viaduct with the visitors immediately below the structure. It was generally conceded that less noise developed than that which arises from a train passing over the surface streets.

The Pico Street project just completed is the outgrowth of the activities of the Los Angeles County grade crossing committee, organized in 1923 to make a comprehensive study of the problem in southern California. The committee is composed of city, county, state and railway representatives. The Pico crossing was found to need relief most quickly, owing to the tremendous amount of vehicular traffic and a daily average of 123 trains of the Pacific Electric Railway across Pico Street.

Originally intended to separate traffic only at Pico Street, the plans were broadened so as to extend the structure over both Tremaine and Longwood Avenues. Involving an expenditure of $306,000, the Pico Street structure is 1,007 ft. in length, being the longest by several hundred feet of any of the 65 grade separations now located on the lines of the Pacific Electric. The section over Pico Street, 291 ft. in length, is of steel construction, so designed as to utilize the minimum amount of road space. The approach on either side is of reinforced concrete, the entire unit being supported by concrete piers spaced at 32-ft. intervals.

The noise reduction has been accomplished largely by the use of mass concrete construction for the trough decks supporting the railway tracks. This feature permits standard rock ballast over the entire length of the viaduct. The massiveness and large number of supporting piers also contribute to elimination of noise and rumbling.

The expense of this project up to the north side of Pico Street was borne jointly by the Pacific Electric Railway and the city, while beyond this point the cost was shared one-third each by the railway, city and county. Work was started on May 27 last and was completed within six months.



The new Pico Street viaduct in Los Angeles eliminates a hazardous grade crossing

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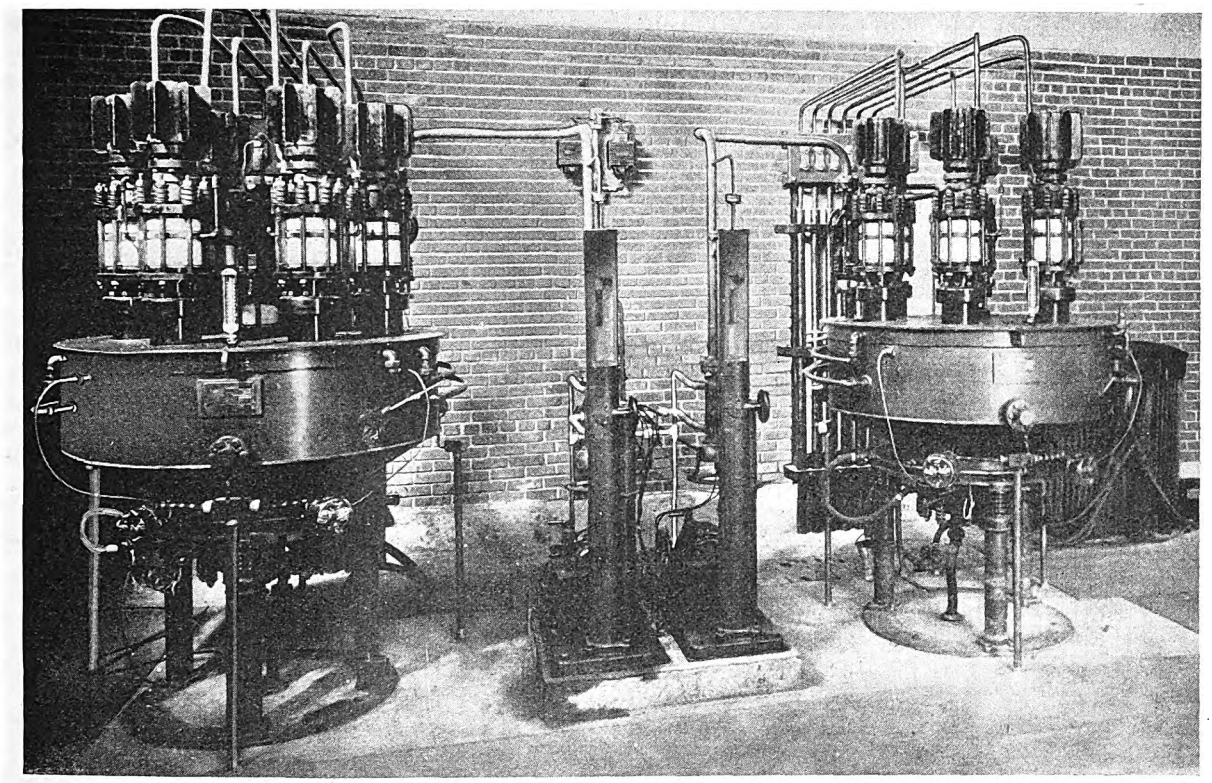

Installation of the 1,000-kw. mercury-arc rectifier set consisting of two six-anode, 600-volt tanks

Rectifier Superior to Converters

on North Shore Line

Operating results of mercury-arc rectifier show higher efficiency, simpler operation, less maintenance cost and other advantages. Five months actual figures indicate that reliability in service has been attained

By Caesar Antoniono

Electrical Engineer Chicago, North Shore & Milwaukee Railroad

Mercury-arc rectifiers in America have been perfected along lines similar to those followed in Europe. The present article, which is abstracted from a paper presented at the regional meeting of the Great Lakes Section, American Institute of Electrical Engineers, held at Chicago, Ill., Nov. 28-30, 1927, is of particular interest as giving details of operating results with rectifiers over an extended period.—EDITOR.

DEVELOPMENT of the mercury-arc rectifier in this country in commercial form is very much in its infancy. It appears to be used more extensively in Europe, and the extent to which it will be applied here is limited only by the economical and operating results which can be obtained.

In considering its adoption to any property we naturally compare it with the synchronous converter and motor-generator set designed to serve the same class of service, with which we are familiar. The advantages of the mercury-arc rectifier over the synchronous converter and motor-generator, according to previous articles, are: (1) High efficiency over the whole working range; (2) very high capacity to absorb momentary loads; (3) insensibility to short circuits; (4) no synchronizing; (5) simple operation and minimum attention; (6) noiseless operation and no vibration; (7) low maintenance cost; (8) reliability of service.

This article discusses each of these points in connection with the experience we have had with the operation of a rectifier on the Chicago, North Shore & Milwaukee Railroad. The rectifier is rated at 1,000 kw., 600 volts direct current and is located on the section of the road as shown in an accompanying diagram. This section is fed also by synchronous converters of 1,000-kw. and 1,500-kw. rating, as shown. The rectifier, made by the

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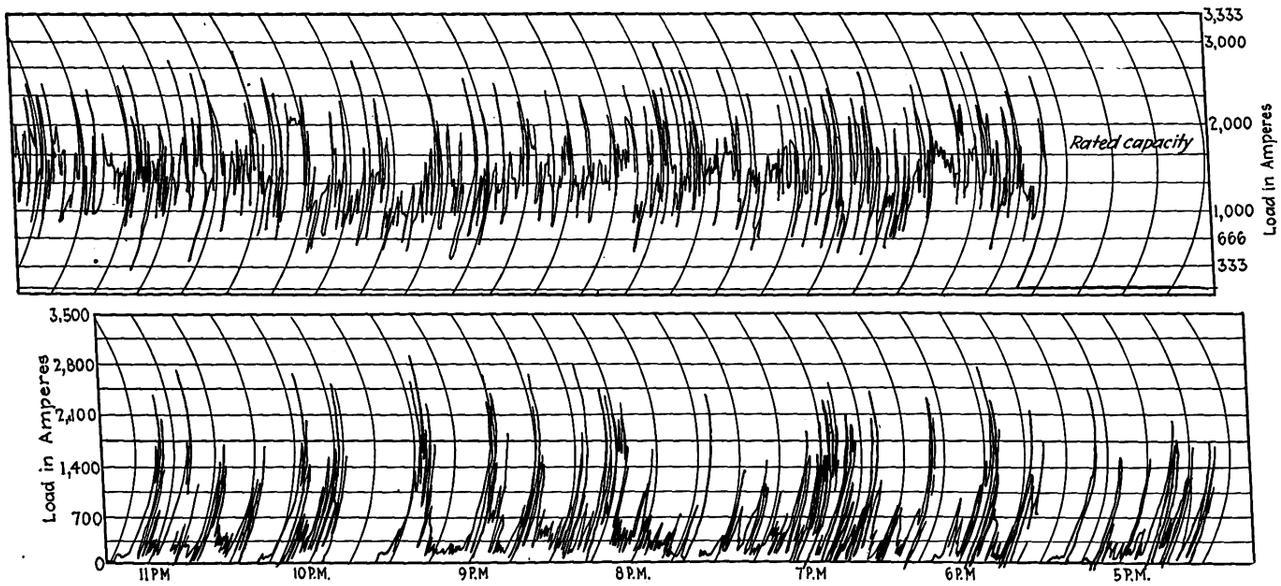
General Electric Company, is said to be the first 600-volt machine made in this country which has been installed in actual service.

The efficiency of the rectifier was compared with that of five converter installations by taking measurements on each substation for five months. The results are shown in Table I. The efficiency is taken as the d.c. output divided by the a.c. input. The figures include the efficiency of power transformers and converter or rectifier. They do not include the power used for the operation of automatic devices in auxiliaries such as vacuum pump, motor-generator set, heaters in the rectifier station, nor the power used by auxiliaries and a.c. contactors in the converter stations. I believe this comparison is fair. Although not exactly correct, it shows a pronounced difference in the efficiencies of the two types of equipment under nearly similar load conditions and very low load factor.

A load of this kind would be without thermostatic control and might last indefinitely. It could be caused by traffic schedule disarrangement on account of trouble, extra passenger or freight service or a trolley wire on the ground at such a distance that the resistance of the feeders would limit the current.

Happenings of this nature are not unusual on a railroad, and I believe that we have more than one time imposed on the rectifier an overload of much longer duration than we know. There are no recording instruments to show when this occurs. The rectifier does not show any signs of having been abused; momentary opening of the high-speed circuit breakers is the only indication that there must have been excessive load.

Our experience shows that the rectifier is not sensitive to short circuits. Repeated reclosing on a short circuit does not affect the rectifier. Under the same treatment a synchronous converter of the same capacity would be likely to flash over regardless of the protective devices, and in an automatic substation it would lock itself up and the station would be shut down until an inspector could put it back in service.



Above—Current delivered by mercury-arc rectifier on day of extremely heavy load
Below—Another graphic ammeter chart showing typical load on the rectifier substation

The ability of the rectifier to carry high momentary overloads is seen from the graphic ammeter chart showing current delivered on a day of extremely heavy load. The chart was taken twelve hours after the unit was put in operation. It shows load peaks much above the rating of the rectifier. There were no signs of its being overloaded, and an occasional opening of the high-speed circuit breaker, which would reclose immediately, was the only trouble experienced in carrying this load. The other graphic ammeter chart shows a typical load on the station. There are many very high load demands of short duration, some of them well above the rated capacity of the rectifier.

On sustained overloads we are not in position to give much information. Usually the load demand above the rectifier rating is of short duration, but there are unusual conditions on the railroad when a load of 175 or 185 per cent of the substation capacity may be carried by any of these stations. The duration of this load is controlled by thermostats on the load-limiting resistors set to release this load in about six or seven minutes.

It is, however, possible to have a load above the rating of the equipment and below the 175 per cent overload relay, setting for a much longer time than seven minutes.

Operation Is Simple; No Synchronizing Necessary

The fact that synchronizing is not necessary with the rectifier is quite important. In the automatic substations on our system only four to six seconds is required to connect a rectifier to the line. From 20 to 35 seconds is required to put a converter on the line. Therefore, we can deliver a higher voltage to the train and trolley 16 to 29 seconds sooner with a rectifier.

We must agree that the mercury-arc rectifier requires less attention than the synchronous converter and its operation is much simpler. There are no brushes, commutator and slip rings to take care of. There is no dust spreading over the equipment. This advantage is very much appreciated in automatic stations without attendants. The ventilation of the equipment and buildings is also simplified as compared with converters, especially in unattended stations.

I do not want to create the impression that there are

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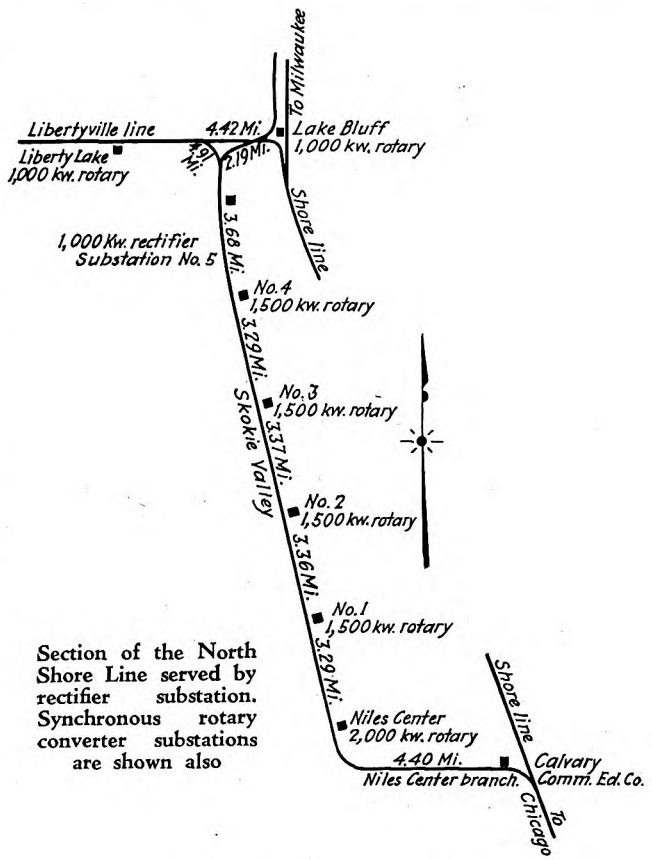
less devices involved in the mercury-arc rectifier than there are in the converter station. On the contrary, with the rectifier more auxiliaries are used, such as arc-starting exciters, vacuum pump, water supply, temperature regulators, tank heaters, etc. While with us some of these devices have caused a large number of shutdowns, the troubles were in the individual pieces of apparatus and they have been corrected. Those devices should not require much attention.

The absence of vibration and noise in the mercury-arc equipment makes it possible to install it in locations where the synchronous converter would not be allowed. In one converter installation it cost about $8,000 for soundproofing and ventilating the substation building, eliminating the noise to comply with the wishes of the surrounding residents. Such expense would not have been necessary with mercury-arc equipment. Incidentally, in addition to the first cost we have added ventilating equipment and extra building maintenance. Obviously with the absence of vibration it is not necessary to install special foundations for the rectifier; it may be set on an ordinary floor. Ventilation becomes of minor or no importance, and in general a less expensive building is required.



Section of the North Shore Line served by rectifier substation. Synchronous rotary converter substations are shown also

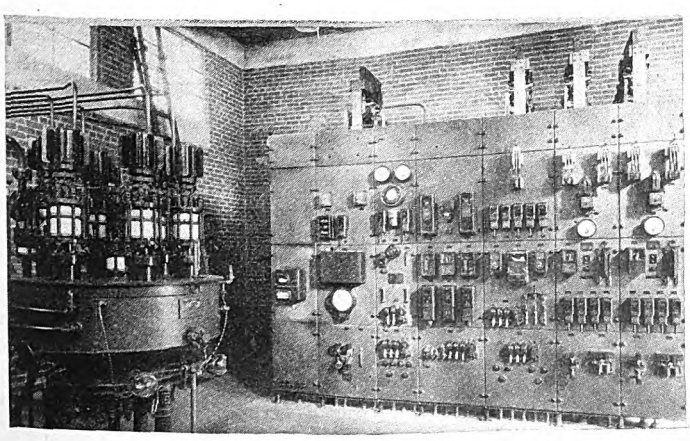
Reliability and Lower Maintenance Costs Important Considerations

We do not know at this time just what maintenance will be necessary on the rectifier. From May, 1926, to May, 1927, this station was attended by an operator and the manufacturers of the rectifiers kept a close watch on its performance. Being in a development or trial stage, they took care of necessary maintenance. In addition, new developments which they made in other installations were applicable to this equipment and minor changes were made accordingly. Since May of this year this equipment has been in automatic operation without an operator. The maintenance required is very little; outside of the regular weekly inspections it has amounted only to supplying a little oil. Like others, we are watching this item with a great deal of interest. Our impression is that the maintenance will be very much less than that required for a converter.

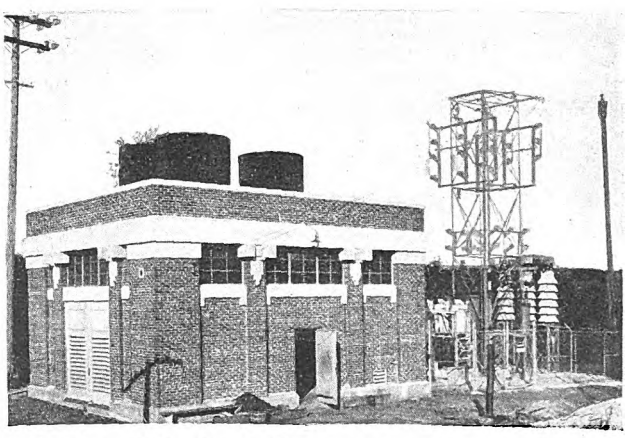
The automatic rectifier station is as reliable as the average 60-cycle synchronous converter station of the same capacity, if not more so.

The record for this rectifier substation commencing with May, 1926, when it was first put in service, all through a trial and adjusting stage until May, 1927, when it was made automatic, is given in Table II. Commenting on the data in this table it is of interest to note that the time the rectifier was out of service on account of trouble with the rectifier itself was 0.435 per cent of the total time. The time lost on account of the auxiliary failures was 0.674 per cent of the total time.

The nature of the trouble with the auxiliaries is rather interesting. It would be expected to have a larger amount of trouble with the rectifier on account of its newness in the field, but to have a small motor-generator set or a chain on a water pump and motor cause this bad record is out of place in our days. Engineers have been building and operating motor-generator sets and water pumps for years, but in this case we were after the big things and let the little things cause the most trouble. Fundamentally the record is good; the nature of the troubles is not serious. The record as an automatic substation, since May, 1927, is given in Table III.



The rectifier and complete automatic switchboard, including high-speed circuit breakers in positive and negative machine circuits and feeders



Exterior of the North Shore rectifier substation showing 33,000-volt incoming lines, oil circuit breakers, outdoor type transformer and oxide film arrester

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TABLE I—PERFORMANCE OF RECTIFIER AND SYNCHRONOUS CONVERTER SUBSTATIONS

The kilowatt and efficiency values do not include the power used for the operation of automatic devices in auxiliaries such as vacuum pump, water pump, motor-generator set and heaters in the rectifier station nor the power used for auxiliaries and alternating-current contactors in the converter stations

Substation	No. 1	No. 2	No. 3	No. 4	Liberty	No. 5
Type Machine	Con-	Con-	Con-	Con-	Lake	
Rating, Kilowatts	verter 1,500	verter 1,500	verter 1,500	verter 1,500	Converter 1,000	Rectifier 1,000
May 1927						
Total alternating current input, kilowatt-hours	87,300	43,500	69,600	125,700	115,950	89,700
Total direct current output, kilowatt-hours	62,130	30,550	53,200	97,900	83,154	71,952
Total hours run	341	201	310	434	496	403
Average hours per day	11	6.5	10	14	16	13
Average kilowatt-hours per hour	182	151	171	225	167	178
Efficiency, per cent	71.2	70.2	76.5	78	71.8	80
June 1927						
Total alternating current input, kilowatt-hours	86,800	34,200	74,400	84,300	139,950	75,900
Total direct current output, kilowatt-hours	59,024	23,214	58,200	62,400	105,844	62,857
Total hours run	300	180	330	315	660	270
Average hours per day	10	6	11	10.5	22	9
Average kilowatt-hours per hour	130	128	176	197	160	232
Efficiency, per cent	68	67.8	78.3	74	75.6	82.8
July 1927						
Total alternating current input, kilowatt-hours	82,200	34,200	78,300	95,700	146,100	79,950
Total direct current output, kilowatt-hours	57,140	25,294	60,800	73,000	104,263	65,747
Total hours run	341	201	341	372	715	387.5
Average hours per day	11	6.5	11	12	23	12.5
Average kilowatt-hours per hour	167	125	178	196	131	170
Efficiency, per cent	69.5	73.7	77.6	76.3	71.3	82.2
August 1927						
Total alternating current input, kilowatt-hours	95,700	32,100	104,400	84,600	119,250	70,215
Total direct current output, kilowatt-hours	69,770	21,133	83,200	65,800	88,246	56,721
Total hours run	403	186	372	310	434	341
Average hours per day	13	6	12	10	14	11
Average kilowatt-hours per hour	173	113	223	212	203	166
Efficiency, per cent	72.9	65.8	79.7	77.8	73.1	80.7
September 1927						
Total alternating current input, kilowatt-hours	84,300	50,220	95,370	83,040	118,740	83,460
Total direct current, output, kilowatt-hours	61,190	33,197	75,300	62,300	88,731	67,868
Total hours run	330	240	360	285	525	420
Average hours per day	11	8	12	9.5	17.5	14
Average kilowatt-hours per hour	185	138	209	218	169	161
Efficiency, per cent	72.6	66.1	78.9	75.0	74.7	81.3
Average efficiency of each substation, per cent	70.8	68.7	78.2	76.3	73.3	81.7
Average kilowatt-hours per hour	167.4	131	191.5	209.2	166	181.4
Grand average, efficiency, per cent			73.4			81.7

Of all these shut-downs, the five lock-outs after the third closure of the oil switch could be questioned and possibly may have been caused by arc-back in the rectifier, or by other troubles in the control which we have not detected. None of the remaining troubles were inherent with the rectifier, but were caused by auxiliary devices.

Our confidence in its reliability is such that we have established a weekly inspection for this rectifier station, but we do not consider it advisable at present to leave a converter so long without inspection.

Rectifier Compared With Synchronous Converter of Same Capacity

The record of the rectifier was compared with that of a synchronous converter of modern design and of the same capacity. This converter is located on another section of the railroad where the load conditions are about the same. It is protected from excessive loads by load-limiting resistors without high-speed circuit breakers. In this comparison I did not use any of the converters shown in the accompanying illustration, because these converters are of larger capacity than the rectifier and naturally they are more stable and would take a larger shock and carry more load without flashing over. Neither have I used the converter at Liberty Lake, as the mo-

TABLE II—RECORD OF SHUT-DOWNS OF RECTIFIER FROM MAY, 1926, TO MAY, 1927

Cause of Shut-down	No.	Total Time Minutes
High temperature of tanks	2	48
Exciter trouble	39	536
Driving chain and motor on water pump	13	315
Loose connection and bad control circuit	3	50
Vacuum-pump trouble, motor and oil pump	3	260
Flashover of anodes	6	819
Starting anodes sticking	5	602
Miscellaneous unknown	12	1,109
Total shut-downs	83	3,739

Total time rectifier operated 337,140 minutes.

Shut-down by failure of	No. of Times	Average Time Minutes	Per cent of Time of Operation
Rectifier	25	58	0.435
Auxiliaries	58	39	0.674
All	83	45	1.109

mentary load demands on this station are less than they are on the rectifier.

The converter which I compared had 45,434 hours of run on its record on May, 1927, and had 34 flashovers causing as many shut-downs, representing 276 hours out of service on account of flashovers. There was an average of 8.1 hours out of service per shut-down, as the majority of these flashovers damaged commutator flash barriers, brushes, brush rigging and the insulation in other parts of the machine.

Since May, 1927, to date, this same converter flashed over eight times, and due to the many flashovers which this machine has had extensive repairs had to be made on the commutator, rings and other insulation involving 150 hours in one shut-down. This record seems to indicate that the troubles with the rectifier itself probably will not be as serious as with the converter of the same capacity under similar load conditions.

The writer has great confidence that the mercury-arc rectifier is here to stay and predicts in ten or fifteen

TABLE III—RECORD OF FAILURES SINCE MAY, 1927, WHEN SUBSTATION WAS MADE AUTOMATIC

Failure in auxiliary	No. of Shut-downs
Motor on one vacuum-pump burned out	1
Locked out after third reclosing of the oil circuit breaker within a definite time during storms	3
Locked out on account of broken spring on oil-switch mechanical latch	3
Locked out after third reclosing of the oil circuit breaker within a definite time, cause unknown	5
Fuse blown on operating transformer supplying power for the operation of devices	1
Total shut-downs	13

years from now a large application supplementing the converter. The converter had its days, the rectifier's days are coming. It is true that the rectifier at present costs more than a converter of the same capacity and there is some misunderstanding as to its rating. But with an increasing number of installations and our co-operation as operators with the manufacturers the development process will be speeded up and the production cost will naturally be reduced to a figure comparable with that of the converter.

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Birmingham Believes in
Advertising Its Service

Coffin brief of Alabama company shows that it uses a great variety of means for bringing the merits of car riding to the attention of its public

EXTENSIVE advertising of its railway and electric light and power service is believed in by the Birmingham Electric Company, Birmingham, Ala., as a paying proposition. It uses all the recognized mediums, such as newspapers, billboards, car cards and the backs of its electric light bills. A typical message appearing on a lightbill one month was as follows:

"Let the street cars pay your gas and electric bills. By using the street car instead of your automobile in going to and from town every day you will save enough each month to more than pay your gas and electric bills."

In using the inside of its cars the company not only "takes its own medicine," but says in its brief for the 1927 Coffin Prize: "In our opinion, this is the most effective advertising that our company has used."

The inside car advertising is not in the usual position of a car card, but in signs 8x30 in., fitting into metal frames, which are fastened in the deck windows, so the signs can be seen from both the inside and the outside. There are seven of these signs on each side of the car. Viewed from the outside, each window contains one word, or perhaps two short words, the seven signs forming a sentence. On the reverse side of each of these cards is other wording which is visible to passengers inside the car.

These inside signs are illustrated in colors and each contains a separate sentence or statement, usually information about the street railway service, or what might be termed good-will copy. These signs are printed in smaller type than those on the outside because they are read at a comparatively short distance by passengers in the car, whereas the outside signs may be read 40 or more feet away.

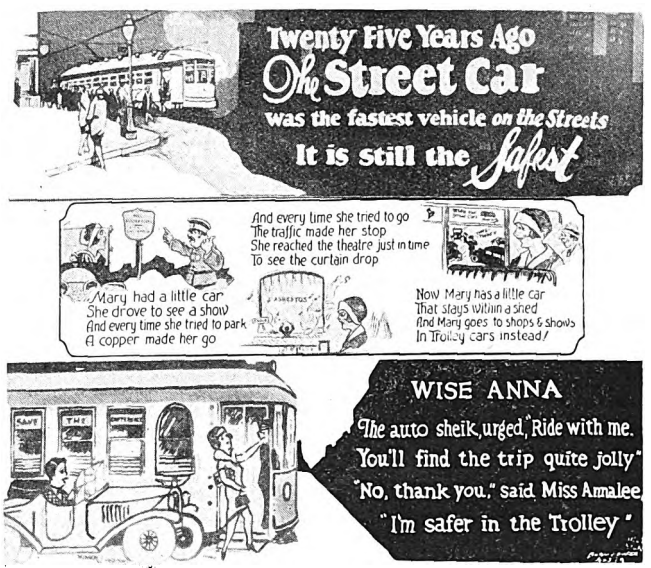
These window signs are changed once a month. Some of the copy used for the outside lettering follows: "Use the street car, safe, economical, dependable." "Use the street car, avoid accident liability." "Street cars are the best means of going to and from town."

The following have been used on the inside of cars. "One of the ways to relieve traffic congestion is to use the street car." "A good street car railway system is essential to a city's progress." "One hundred extra cars are used to carry the rush-hour crowd every afternoon." "If you have any commendation or criticism for our service, write to us about it."

These cards are painted by colored stencil process and the reverse side is printed on a press. They are relatively inexpensive when used in large quantities.

Dash Posters Also Carried

In addition, dash posters of heavy cardboard are carried on both ends of the car and are changed weekly. Approximately 90 per cent of these spaces are used for posters carrying messages and slogans similar to those used on billboards and other advertising of the company. The other 10 per cent is used for carrying posters for local organizations, advertising amateur performances, religious and educational meetings, etc. This space is also used for advertising baseball and football games, circuses, theaters, etc., all of which help to increase street car traffic. On occasions when large conventions are being held in the city special dash posters are used,



Attractive window signs in colors amuse the car riders and teach a lesson

reading, "Welcome, Visitors! Let us serve you!" or some similar message.

Other wording that has been used is: We try to avoid accidents, do you?" "Let us solve your parking problem."

Views are published of typical attractive window signs, a typical dash sign and a drawing showing the method of making the frames for the signs.

Moving Pictures Found Effective

Moving pictures have also been used very advantageously in the publicity program. A short movie reel was made entitled "Mrs. Birmingham Goes Shopping." The rôles were taken by members of the transportation department and the narrative of the scenario included a satire on the difficulties of finding a parking place and getting through congested traffic. The reel was run for a week in a leading downtown theater and then made a tour of the suburban theaters. As the picture contained several excellent comedy situations and

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Dash signs are changed once a week and are held in a frame for their protection

made no direct mention of the company, the theaters showed it free of charge.

A series of ten short films, or trailers, have also been used during the year. Several of these dealt with the parking problem; others suggested using the street cars for going home to noonday lunch, while still others depicted the various operations incident to maintenance, such as car washers in operation.

Display advertising has been used each week in each of the three daily newspapers. After trying several different sizes and styles of ads, the company decided to use one large advertisement each week in each of the three papers, rather than running a small advertisement more frequently. These advertisements are as a rule approximately a quarter of a page and are such that they will dominate the page and will force their attention upon the reader.

All copy for newspaper advertisements is prepared by members of the company's staff, but a commercial artist is employed from time to time to prepare illustrations. The cuts are usually such that they can be used a number of times by changing the copy. An old cut run with new copy, after an interval of a month or more since its last publication, is considered as effective as an entirely new illustration. All newspaper copy has been limited to short statements about the service and is designed to tie in with the other mediums of advertising which are used.

One subject about which much of the advertising in newspapers has been built is that "the street car is the most convenient and satisfactory means of going to and from the crowded business area."

In addition to the advertising in the daily papers, four ads are carried in practically every weekly paper published in the country, including two negro papers and two papers published in Italian. Programs and papers published by schools and churches and fraternal and labor organizations are patronized to a limited extent.

Direct Solicitation

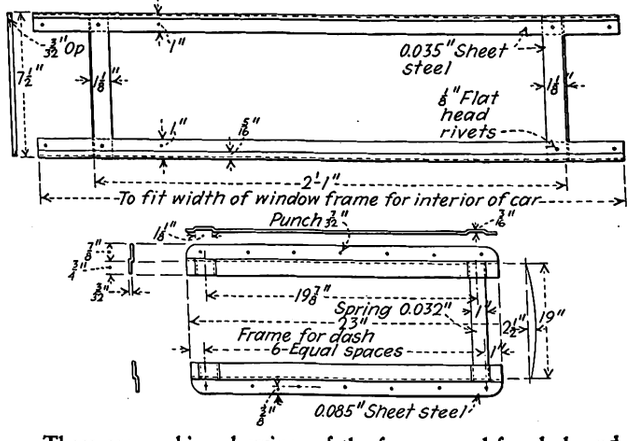
Occasionally direct solicitation for business has been undertaken. One case was in a district which formerly had been served by a shuttle line, but where it was decided to install through service. The neighborhood concerned was a fashionable one where many of the residents had more than one automobile per family, but the line never had enough revenue even to pay operating expenses.

The week before the new through service was put in effect five trainmen were selected to make a house-to-house canvass of the territory served by the line. They were coached to deliver a short talk concerning the through service and the new schedule. Small cards announcing the plan and containing the detailed schedule on the back were printed for distribution. The various canvassers, under the supervision of the efficient chief inspector, called at every house in the territory served, explained the new service and left one of the cards containing the schedule. Schedule cards were also placed in the various drug stores in the distirct and distributed by the car crews during the week prior to the opening of the new line.

When the new service was inaugurated a noticeable increase in traffic was felt, and motor car owners who never patronized the line before became regular patrons. The results were so satisfactory that a similar canvas and distribution were made when another line began through service several months later.

That the company's broad program of selling its service has been successful is shown by the steady increase in patronage which has resulted. The total number of passengers transported during the past three years is as follows:

1924	67,345,838
1925	69,235,321
1926	70,775,375



These are working drawings of the frames used for dash and interior signs at Birmingham, Ala.

Earnings for the first four months of 1927 exceeded the earnings during the same period last year by $5,562.49.

This increase is doubly remarkable because it was obtained during a period in which the number of automobiles per inhabitant was increasing at an unprecedentedly rapid rate.

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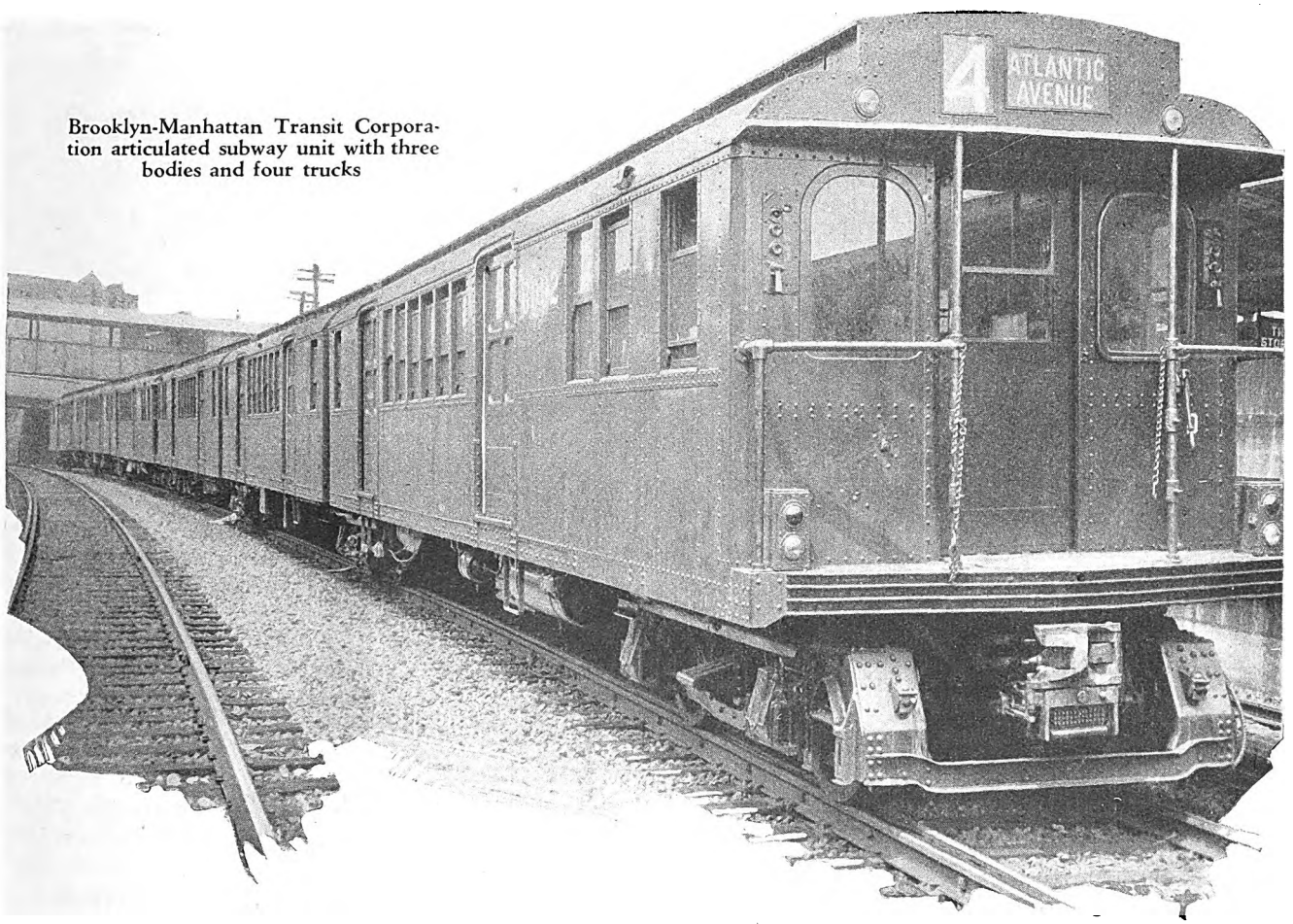

Brooklyn-Manhattan Transit Corporation articulated subway unit with three bodies and four trucks

Articulated Cars

Meet Unusual Requirements

This type of car is suitable for heavy loads on subway and surface lines, but is not flexible where small units are needed at certain periods

By W. J. Clardy

General Engineer Westinghouse Electric & Manufacturing Company

CONSIDERABLE study has been given the articulated car, both in the United States and in foreign countries. Permanently coupled cars, which are closely allied with articulated units, have also received some attention. Both types appear to have advantages for meeting certain unusual requirements, but their field is more or less limited.

Of the important articulated cars illustrated, the most popular consists of two bodies mounted on three trucks. Longer units are practicable from a construction standpoint, as that of the Great Northern Railway of England, which is made up of five car bodies on six trucks.

The permanently coupled units consist of two complete cars connected in a manner which precludes their separation while in normal service. Such units can be split up easily when they are shopped and little special construction is involved. Not more than two car bodies have been joined in a unit.

The field for articulated and permanently coupled cars is restricted because such units are much less flexible than single cars. The most extensive use of articulated units has been in subway service where relatively long trains are required, even during non-rush hours. One principal advantage is the practical elimination of nosing. This results in better riding qualities and a material reduction in track maintenance. Permanently coupled cars are also used in subway service, but the advantages are not as great with respect to track maintenance and riding qualities as for articulated cars.

Surface operation of articulated and permanently coupled units is likewise restricted. Two-car units are frequently useful in rush hours, but traffic rarely demands

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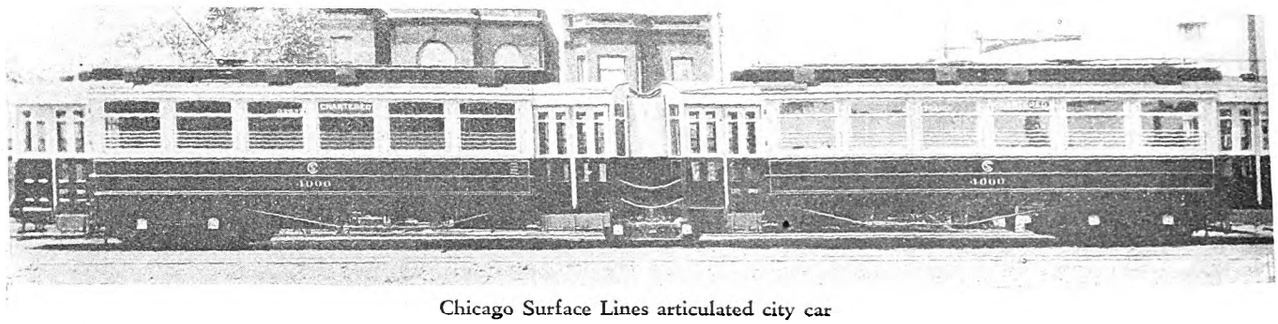


Chicago Surface Lines articulated city car

more than single cars for the non-rush. Investment in equipment that can only be economically used during heavy traffic periods is difficult to justify. Where traffic demands two or more cars in trains in all-day service, the articulated car can be used. In fact, it offers an excellent opportunity to secure lower operating costs by reducing expenditures for maintenance, power and platform labor. A recent adoption by a high-speed, heavy-traffic interurban illustrates the utility of articulated cars.

Brooklyn Subway Cars Have Three Bodies

Articulated cars are being generally used by the Brooklyn-Manhattan Transit Corporation in subway service. In 1925 four trial articulated cars were introduced. Their success led to the purchase of 67 additional units in 1926 and 50 more in 1927.

These articulated cars consist of three car bodies mounted on four trucks with 200-hp. motors on the front and rear trucks in the first four triplex cars. In the later cars one motor is placed on each truck. The electrical apparatus really comprises two complete subway equipments with a total of four motors and two sets of control per unit. The complete weight of one articulated unit is 106 tons.

Articulated car subway operation in Brooklyn demonstrated several operating advantages as follows: (1) Reduced track maintenance incident to elimination of nosing; (2) improved riding qualities; (3) less train friction, resulting in energy economy; (4) passage between car bodies of a unit giving better distribution of load.

The units are suitable for both express and local service. A non-rush-hour train consists of two triplex cars, while three are used during the rush. Variations in headways, together with the relatively large capacity that must be provided even in non-rush-hour trains, make the triplex car sufficiently flexible to meet Brooklyn subway requirements.

An articulated unit known as a "duplex car," placed in service on the Brooklyn surface lines in 1924, was constructed from old equipment. It consists of two car bodies mounted on three trucks. This is entirely experimental and no further use has been made of equipment of this type on surface lines in Brooklyn.

Boston Elevated Railway Uses Permanently Coupled Cars

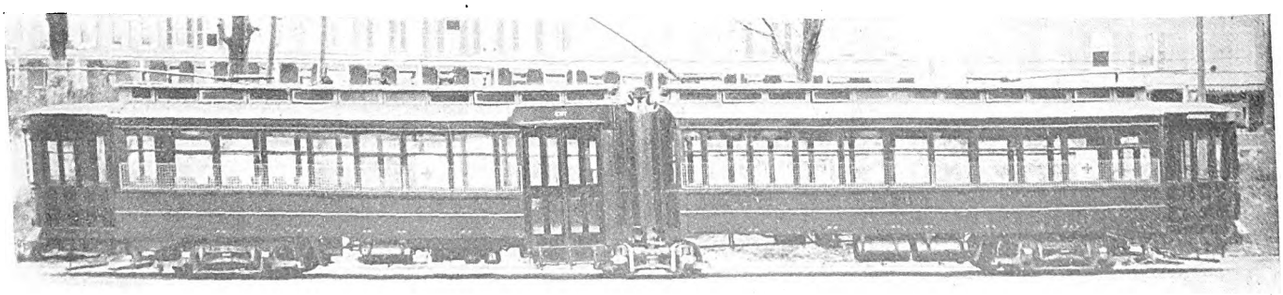
The Boston Elevated Railway operates a number of permanently coupled cars in subway service and has experimented with articulated cars on surface lines. A definite program for the retirement of old equipment is in effect and developments that promise more economical operation are carefully investigated.

The permanently coupled cars are used in the East

SOME ARTICULATED OR PERMANENTLY COUPLED TRAIN UNITS

User	No. of Bodies	Service	Over-all Length, Ft. In.	Weight, Lb.	Seats	Wt. per Seat, Lb.	Motors	Wheel Diameter In.	Control	Single or Double End	Collector	New or Rebuilt from Old Cars	Date in Service
Articulated													
Boston Elevated Railway	2	Surface	61— 9¼	39,000	104	750	4— 30	30	K-28	Double	Trolley	Rebuilt	1912
Brooklyn-Manhattan Transit Corporation	2	Surface	63—10	72,000	71	1013	4— 40	30–22	K-28	Double	Trolley	Rebuilt	1924
Milwaukee Electric Railway & Light Co.	2	Surface	89— 2½	75,000	102	735	4— 65	34–22	K-35	Double	Trolley	Rebuilt	1920
Detroit Municipal Railway	3	Surface	122— 8	75,000	140	536	4— 60	28	K-35	Single	Trolley	New	1924
New York Rapid Transit Corporation	3	Subway	136— 9	212,000	160	1072	4—180	34–30	M.U.	Double	Third rail	New	.....
Great Northern Railway of England	2	Suburban	102— 0	100,000	128	781	.....	For steam railroad service					
Great Northern Railway of England	5	Main line	246— 1	264,700	128	2068	.....	For steam railroad service					
United Railways & Electric Company	2	Surface	74— 8	66,070	87	760	4— 65	33	HL	Double	Trolley	Rebuilt	1926
Washington, Baltimore & Annapolis Electric Railroad	2	Interurban	99— 8¾	114,000	112	1018	4—125	36	HL	Single	*	New	1927
Chicago Surface Lines	2	Surface	89— 2	72,000	91	791	4— 50	33	K-35	Double	Wheel trolley	Rebuilt	1926
Permanently Coupled													
Boston Elevated Railway	2	Subway	94— 6	88,800	88	1009	8— 40	26	M. U.	Double	Third rail	New	1923
Twin City Rapid Transit Company	2	Surface	94— 0	53,000	104	510	8— 25	26	K-43	Single	Trolley	New	1922

*Both overhead trolley and underground conduit.



United Railways & Electric Company of Baltimore articulated city car

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Boston Elevated Railway permanently coupled subway cars

Boston Tunnel. On account of clearance limitations it was necessary to build small, light-weight, double-truck subway cars. There are 40 of these, weighing 44,000 lb. complete with all equipment excluding load. They are equipped with four 40-hp. motors mounted on 26-in. wheels. There are three sliding doors on each side of the cars and end doors which permit passage between cars. The equipment is arranged for operation in units of two cars permanently connected. It is possible to separate the cars of a unit, but it is necessary to do it in the shop. Trains are made up of one or more two-car units. The new equipment has proved very satisfactory in this service. Permanently coupled cars do not have all of the advantages of articulated units with respect to "nosing," but the riding qualities are good and operation here is efficient.

The articulated units experimented with on surface lines were constructed from two old single-truck cars. Operation was not particularly successful and no service is maintained at present with this type of equipment.

W., B. & A. Runs Articulated Cars in Interurban Service

The Washington, Baltimore & Annapolis Electric Railroad placed ten articulated cars in service last spring. Each unit consists of two car bodies mounted on three trucks, both the front and rear trucks being equipped with two 125-hp. motors. The total weight of a complete unit is 58 tons.

The cars are used in half-hour limited service on the main line between Washington and Baltimore. The distance is 40 miles and the running time 85 minutes, a schedule speed in excess of 28 m.p.h. Normally one articulated car is run, but electro-pneumatic unit switch train control is provided, as two units are required to handle heavy travel. Comfortable, spring-cushioned, mohair-upholstered seats arranged to revolve in pairs are a feature of the cars. Savings in maintenance, power and platform labor promise an attractive return on the investment in the equipment.

The Milwaukee Electric Railway and Light Company has used on the surface lines for several years articulated units consisting of two car bodies mounted on three trucks. These were constructed in the railway company's shops from old equipment. The vestibules were removed from one end of each car and the cars joined together through a swivel link, supported on a new truck. The complete weight is 75,000 lb. There are four 65-hp. motors, two on the front truck and two on the rear truck. Drum control is used, since there is no necessity for operating more than one unit.

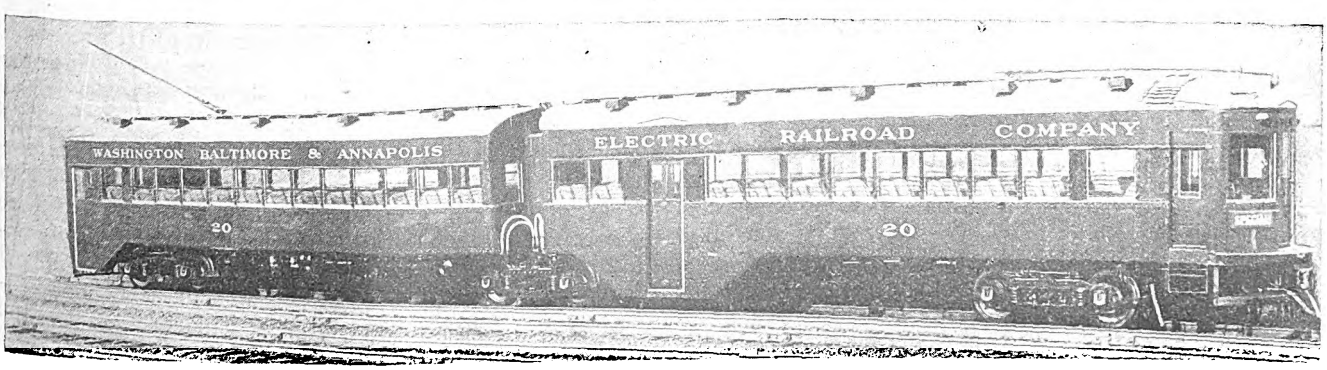
These three-truck articulated cars were built primarily for rush-hour, heavy-load trips. The units are economical during periods of heavy travel, since only two platform men are required. The conductor is located in the vestibule between the car bodies. Operation is center-entrance, pay-as-you-enter, front or center exit. They have proved satisfactory after several years service.

United Railways & Electric Company Has Both Types

The United Railways & Electric Company of Baltimore is making extensive use both of articulated and permanently coupled cars. Experience has indicated that the articulated cars are the most satisfactory. All units now being built and planned for the future are articulated. There are 28 of the articulated cars in Baltimore. They weigh 66,000 lb. complete. Each unit consists of two car bodies mounted on three trucks with two 65-hp. motors on each end truck. Double-end electro-pneumatic unit switch control is used. Two old cars are rebuilt to form each articulated car, but new electrical equipment is applied.

The articulated cars are operated front-entrance center-exit with only two platform men. Normal running is single end and the controller at the rear is used only in emergency. The cars were constructed primarily for rush-hour service. While used mostly during the heavy traffic periods, they sometimes are run throughout the day. The articulated units have proved successful in Baltimore and some attractive operating economies are being realized.

The Department of Street Railways of the City of Detroit purchased a special four-truck, three-car body



Washington, Baltimore & Annapolis Electric Railroad articulated interurban car

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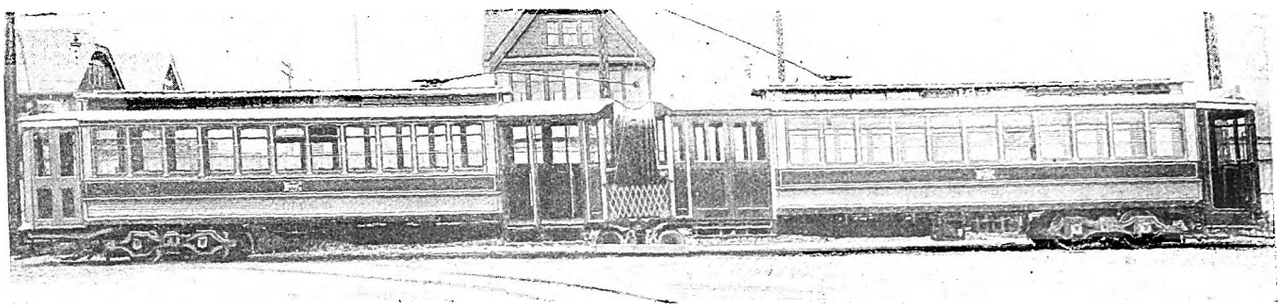

The Milwaukee Electric Railway & Light Company articulated city car

articulated car some time ago for trial in heavy city service. The unit has four 60-hp. motors, two on each of the end trucks, with drum control for single-end operation. The complete weight is 75,000 lb.

No additional articulated cars have been purchased for Detroit, though their use on heavy traffic lines has been contemplated. A few routes require two-car trains in all-day service and offer opportunity for economical service with articulated units. The Woodward Avenue line has such heavy traffic that it is difficult to provide sufficient service with two-car trains. Three-car trains could be used to advantage and possibly the articulated triplex unit would offer a means of effecting an economy.

Chicago Surface Lines Tries Articulated Unit

The Chicago Surface Lines built an articulated unit consisting of two car bodies mounted on three trucks. It was constructed from old cars early in 1927 and has been in service since that time. It is equipped with four 50-hp. motors, two on each end truck, and double-end drum control. The complete weight is 72,000 lb. and seats are provided for 91 passengers.

It is not planned to construct and operate additional articulated cars in Chicago. The performance of the present unit has indicated that economies are not sufficient under existing operating conditions to justify extensive use of rolling stock of this type.

Readers' Forum

The Off-Peak Load Can Be Built Up

Mount Vernon, N. Y., Jan. 4, 1928.

To the Editor:

Henry W. Blake's article in the Dec. 10 issue on "Fares and Fare Collection in Europe" and his Dec. 24 article on "Answering Questions Before They Are Asked" should be read and reread by every American operator interested in the sale of the ride.

The last two or three years have seen a thorough overturn of ideas on car appearance and upholstery. That is all to the good. Yet it is not enough to provide better goods; we must also know how to price them and how to suggest objectives for riding. It is astonishing how the same management which spends hundreds of thousands of dollars for new cars will hesitate to plunge for a fraction of that amount in trying to sell rides.

We have been hearing much lately about increased rush-hour business going hand in hand with decreased off-peak business. Should this condition be taken for granted? What claim can we lay to salesmanship and sales effort if we are going to assume that all our patronage is compulsory?

European roads offer helpful suggestions here. You do not have to follow their copper zones, but you can have 5-cent short-haul fares rather than no fares at all. Look over the variety of fares in London alone, and ask yourselves if you have no opportunity to do something with lower rates in the shopping hours. Why the slogan of "Shop more from 10 to 4" unless you put some inducement back of it? Don't let the bugaboo of non-registered fare prevent you from trying plans that make the ride more agreeable through elimination of change-making and transfers. Bear in mind that the healthiest group of electric railways in America—those of Canada—manage to get along with half our fare—checking labor. Don't let the accounting tail wag the transportation dog where more revenue from more riders is concerned.

To return to the lament about loss of off-peak traffic, it is a loss to be expected on a flat-fare system because the off-peak rider is not under the same urge to use the trolley service. But it is not unavoidable. More off-peak and short-haul fares supply the natural answers. The less the prospect needs us, the more we should seek his business.

A beginning in this direction has been made by the Pittsburgh Railways, which shows a condition directly opposite to the usual American complaint. On this property the peak or necessity riding has decreased in proportion, probably, to decreased employment. On the other hand, the off-peak or voluntary riding has increased. Better off-peak service through one-man cars and more attractive, more reliable equipment have helped to produce this result. However, the basic reason is the adoption of at least three fare plans that encourage off-peak patronage.

One of these is the 5-cent short-haul fare in use on more than a dozen routes. It encourages neighborhood shopping between the business peaks and neighborhood theater travel at night.

The second and most important of these plans is the weekly pass, of which some 60,000 are sold. As the pass rider cannot take more than two peak rides a day, it is obvious that his additional two or even four rides must be off-peak. They also tend naturally to be short-haul.

The third plan is the Sunday-holiday pass, which has proved that people in Pittsburgh will ride the trolley without compulsion.

These three schemes are far from exhausting the possibilities in pricing the ride according to quantity, length and time purchased. They do prove, however, that there can be no talk about ride salesmanship without differentiation in the rate of fare. Let more railways follow Pittsburgh's example and then we can have hopes for still greater refinements, more particularly in adding off-peak passes, as urged by the writer for years past.

Walter Jackson.

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Electric Railway Journal Maintenance Data Sheet

ROLLING STOCK—STANDARDS—13

C.E.R.M.M.A. Inspection Rules and Uniform Charges

IN THE rules covering the condition and repair of freight cars for interchange service as adopted by the Central Electric Railway Master Mechanics Association May 11, 1927, and made effective Jan. 1, 1928, and as published in ELECTRIC RAILWAY JOURNAL for May 28, 1927, the following changes should be made:

In Standard No. 3, paragraph 1, last line should read: "The Central Electric Railway Master Mechanics Association. The words Master Mechanics have been added.

In the various inspection forms shown on standard sheets Nos. 7 and 8 the letters C.E.R.M.M.A. should be added so that they will read Form C.E.R.M.M.A. 1, 2, 3, 4, and 5. The same addition is to be made in the text wherever these forms are mentioned as in rules 2, 5, 6, 10, 12, 26 and 27.

Fig. No. 2 has been given to the standard axle shown on standard sheet No. 7.

On standard sheet No. 8 the repair card should have a heading "Central Electric Railway Master Mechanics Association instead of Master Car Builders Association.

On standard sheet No. 4 Fig. 2 should be changed to Fig. 3.

On standard sheet No. 5, rule 15, fourth line from the last, the word flat should be inserted before spot.

After rule 18 (c) the following should be added:

(d) No welding of axles is permissible except at the button which may be built up.

In rule 21 Fig. 2 should be changed to Fig. 3.

In paragraph (b) of the rule, third line, the words "in Fig. 3" should be inserted after B.

The following paragraphs (d) to (p) inclusive should be added to rule 21 and be made effective as of date Jan. 1, 1929.

(d) Periodic repacking of journal boxes, after the expiration of twelve months, as indicated by the stenciling on car, regardless of the responsibility of handling company for change of wheels or other repairs.

(e) All journal boxes shall be jacked; all journal wedges and bearings removed for examination, and renewed where necessary; all boxes cleaned and repacked with properly prepared packing (new or renovated) in accordance with C.E.R.M.M.A. recommended practice, and car stenciled. Dust guards shall be renewed, when necessary, only where wheels or journal boxes are changed.

(f) The place (railroad and station), month, day and year of repacking shall be stenciled on car body near the body bolster at diagonal corners with not less than 1 in. figures and letters, using the same station initial as is used for air-brake stencil. This provision also applies to new cars.

(g) No change shall be made in the stenciling unless all boxes are repacked and the work complete, in all details, has been performed.

(h) If car bears no stenciling showing date of previous repacking, all boxes may, if necessary, be repacked in accordance with paragraphs (e) and (f).

(i) This work shall be done only when cars are on repair track for other repairs.

(j) No charge shall be made for repacking, etc., if performed within twelve months from date stenciled on car.

(k) No charge shall be made for repacking, etc., unless all boxes are repacked and the work complete, in all details, has been performed.

(l) Work performed, in accordance with the foregoing, may be charged to car owner at prices specified in Rules.....

(m) Journal bearings having back or lug broken or cracked, or length reduced ⅛ in. or more, or lining loose, cracked, broken, spread over side or worn through to brass, shall be considered as requiring renewal.

(n) Journal bearing wedges cracked, broken, or top radius worn flat lengthwise of wedge, shall be considered as requiring renewal. Care must be taken to see that wedges are not scrapped for wear unless top radius is actually worn flat.

(o) The periodic repacking, etc., does not contemplate any change in the ordinary attention as to oiling and packing when necessary.

(p) At time of periodic repacking inspection must be made of all axles for defects and limits of wear. If defects are found axles should be changed or owner notified on Form C.E.R.M.M.A.-1.

In rule 29 the last sentence should be omitted.

In rule 37 the following should be added to the last sentence so that it will read "Standard safety appliances as applied to electric railways must be completely applied.

The following rules 38, 39 and 40 should be added:

"Rule 38. Bills for repairs made under these rules and for material and labor furnished shall be in conformity with schedule of prices and credits for the articles enumerated plus 15 per cent. Bills shall not be rendered for less than $1 but charges for a less sum than $1 may be held till they amount to that sum."

"Rule 39. All worn out and defective

(*Continued on next page*)

Electric Railway Journal Maintenance Data Sheet

ROLLING STOCK—STANDARDS—15

C.E.R.M.M.A. Uniform Charges—(Continued)

APPENDIX (A)
Air Brake Material

Item Details	8-in. Equipment Pc. No.	8-in. Equipment Charge	10-in. Equipment Pc. No.	10-in. Equipment Charge
38 Triple valve slide valve	1729	1.21	29138	1.21
39 Triple main piston and rings	1725	3.22	1767	3.22
40 Triple main piston rings	10032	0.39	.....	0.39
41 Triple slide valve spring	6520	0.05	6520	0.05
42 Triple graduating valve	1732	0.09	29139	0.09
43 Triple emergency piston	1733	0.77	1733	0.77
44 Triple emergency valve seat	1740	0.84	1740	0.84
45 Triple emergency valve	1735	0.93	1735	0.93
46 Triple emergency valve rubber seat	1737	0.02	1737	0.02
47 Triple check valve spring	1745	0.03	1745	0.03
48 Triple check valve and cap	12850	1.53	13392	1.53
49 Triple check valve case gasket	1754	0.05	1754	0.05
50 Triple valve check valve	1744	0.39	1744	0.39
51 Triple valve strainer	1751	0.08	1751	0.08
52 Triple union	.....	0.17	.....	0.17
53 Triple union nut	1749	0.15	1749	0.15
54 Triple union swivel	1750	0.13	1750	0.13
55 Triple cylinder cap	1746	0.92	1746	1.13
56 Triple graduating stem nut	1747	0.25	1747	0.29
57 Triple cylinder gasket	1753	0.26	1753	0.27
58 Triple graduating stem	1748	0.19	1748	0.22
59 Triple cylinder bolt and nut	10836	0.06	10836	0.05
60 Triple check valve case stud and nut	4887	0.08	4887	0.08
61 Triple union gasket	.....	0.03	.....	0.03
62 Triple emergency valve nut	1738	0.08	1738	0.08
63 Triple emergency piston	1733	0.92	1733	0.92
64 Triple valve gasket	2427	0.08	4886	0.10

Fittings

		Charge
65	⅜-in. pipe	0.03
66	½-in. pipe	0.06
67	¾-in. pipe	0.06
68	1-in. pipe	0.08
69	⅜-in. elbow	0.03
70	½-in. elbow	0.03
71	¾-in. elbow	0.04
72	1-in. elbow	0.05
73	⅜-in. coupling	0.02
74	½-in. coupling	0.04
75	¾-in. coupling	0.05
76	1-in. coupling	0.07
77	⅜-in. tee	0.05
78	½-in. tee	0.06
79	¾-in. tee	0.07
80	1-in. tee	0.08
81	⅜-in. union	0.27
82	½-in. union	0.34
83	¾-in. union	0.41
84	1-in. union	0.54

APPENDIX (B)

WEIGHTS AND CHARGES ON NO. 930-A AND NO. 930 VAN DORN COUPLER PARTS

Part No.	Description	Weight, Lb.	Charge
930-A	Head	260	$32.72 blank 34.23 drilled
930	Head	240	30.33 blank 31.83 drilled
2114-C	Knuckle	80	12.30
2115	Lock	5.84	1.80
2116	Lever, unlocking	2.40	0.85
2117	Knuckle throw	3.60	1.10
1003	Knuckle pin	7.50	0.52
2119	Unlocking lever pin	0.50	0.15
2120	Locking spring	.....	0.35
2118	Washer, spring stop	1.12	0.40
1921	Lock set	4.25	1.25
2121	Stem, guide	.....	0.40
2124	Pin, riveting	.....	0.12
1951	Uncoupling rod	10.94	0.92
2138	Uncoupling chain	.....	0.68
2101	Draft housing	106.50	15.98 blank 17.40 drilled
2104	Draft yoke	63	9.45
2106	Spacer	10	1.72
2109	Follower washer	7	1.50
2110	Draft spring (outside)	26	1.90
2128	Draft bolts and grip nut	.....	0.98
2105	Draft spring (inside)	4.00	0.53
2102	Anchor	135	16.20
2147	Anchor pin	8.05	0.85
2127	Carrier bolt	1.50	0.25
2502	Carrier top	42.50	8.20
2503	Carrier bottom	14.50	3.80
2516	Carrier bracket	3.00	0.85
2517	Housing bracket	3.00	0.85
2078	Radial bar	84.50	5.10
2112	Radial bar thimble	1.78	0.45
1669	Radial bar stop	0.85	0.15
835	Bracket	1.30	0.70

Above charges F.O.B. Chicago, Ill.

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Electric Railway Journal Maintenance Data Sheet

ROLLING STOCK—STANDARDS—14

C.E.R.M.M.A. Inspection Rules and Charges—(Continued)

parts removed from foreign cars for which owner is responsible whose value now exceeds $2 shall be tagged with date removed, car number and initial and kept for a period of 90 days, and same returned to car owner only in case car owner so requests. At the end of the 90-day period defective parts not returned are to be scrapped and credit given car owner in accordance with rules. In case defective parts are returned to owner memo giving car number and initial and date removed must be attached to copy of freight bill sent to owner. If not otherwise arranged for, parts will be shipped charges collect."

Rule 40. When angle cocks, cutout cocks, pressure retaining valves and release valves or detail parts of same, are renewed, ground in or otherwise repaired, account defective, charge shall be made for complete cock or valve and average credit allowed according to price schedule.

Uniform Charges

APPENDIX (A)

Air Brake Material

Item Details	8-in. Equipment Pc. No.	8-in. Equipment Charge	10-in. Equipment Pc. No.	10-in. Equipment Charge
1 Brake cylinder and reservoir complete	69816	$20.35	69818	$25.58
2 Cylinder body	67928	6.60	68426	7.70
3 Piston and rod	1246	2.07	5037	2.71
4 Hollow piston rod	3626	0.83	3636	0.83
5 Cylinder non-pressure head	1217	1.32	1104	2.07
6 Follower stud and nut	2305	0.06	2305	0.06
7 Follower	1142	0.14	1108	0.42
8 WABCO packing cup	68578	0.69	68579	0.83
9 Cylinder release spring	1110	0.83	1110	0.83
10 Cylinder gasket	1147	0.05	1147	0.05
11 Cylinder head bolt and nut	4883	0.06	4883	0.06
12 Reservoir stud and nut	4887	0.08	4887	0.08
13 Reservoir and drain plug	2439	9.08	21838	11.00
14 Reservoir cylinder bolt and nut	4889	0.06	4889	0.06
15 Reservoir drain plug	33310	0.03	33310	0.03
16 1¼x22-in. draw bar hose with tapped and union nipple for 1-in. pipe	46622	$1.90	46622	$1.90
17 1¼x22-in. draw bar hose with tapped and union nipple for 1-in. pipe, credit for fittings	.....	0.56	.....	0.56
18 1⅜x22-in. draw bar hose with tapped and union nipple for 1¼-in. pipe	47080	2.38	47080	2.38
19 1⅜x22-in. draw bar hose with tapped and union nipple for 1½-in. pipe, credit for fittings	.....	0.72	.....	0.72
20 1⅜x22-in. hose with 1-in. nipple and FP-4 coupling	46578	1.96	46578	1.96
20a 1⅜x18-in. hose with 1-in. nipple and FP-4 coupling	46295	1.90	46295	1.90
21 1⅜x22-in. hose with 1½-in. nipple and FP-5 coupling	46242	$2.05	46242	$2.05
21a 1⅜x18-in. hose with 1-in. nipple and FP-4 coupling	46591	1.85	46591	1.85
22 1-in. self locking angle cock	22416	2.45	22416	2.45
23 1-in. angle cock with plain handle	.....	2.31	.....	2.31
24 1½-in. self locking angle cock	22413	2.75	22413	2.75
24a Credit for fittings on 20a, 21 and 21a in good order	.....	1.27	.....	1.27
25 1-in. cutout cock	2135	1.84	2135	1.84
26 1-in. cutout cock, average credit	.....	0.94	.....	0.94
27 1½-in. cutout cock	2092	2.64	2092	2.04
28 1½-in. cutout cock, average credit	.....	1.05	.....	1.05
29 1-in. centrifugal dirt collector	75751	1.84	75751	1.84
30 1½-in. centrifugal dirt collector	75753	2.29	75753	2.29
31 Release valve	2416	0.92	2416	0.92
32 Release valve, average credit	.....	0.50	.....	0.50
33 Release valve rod with or without cotter key and staple	.....	0.08	.....	0.08
34 Pressure retaining valve	3216-1	1.63	3216-1	1.63
35 Pressure retaining valve, average credit	(H-1)	0.75	(H-2)	0.75
36 Triple valve complete	1717	22.53	4870	22.53
37 Triple valve body-bushed	20220	8.86	20216	8.86

(*Continued on next page*)

Electric Railway Journal Maintenance Data Sheet

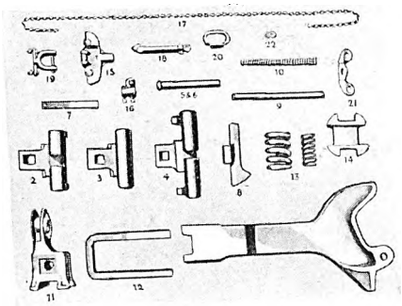
ROLLING STOCK—STANDARDS—16

C.E.R.M.M.A. Uniform Charges—(Continued)

APPENDIX (C)

Tomlinson M.C.B. Car Coupler

FORM 12—REPAIR PARTS



Cat. No.	Part	Description	Charge
14495	1	Coupler body with knuckle springs	$30.00
10673	2	Standard split knuckle	9.00
11024	3	Solid knuckle	10.00
14485	4	High knuckle, 16-in	11.50
14236	5	Knuckle pin for standard knuckle	0.85
14486	6	Knuckle pin for high knuckle	0.90
14237	7	Knuckle spring	0.25
14497	8	Forged sliding lock	5.00
13884	9	Sliding lock pull rod	0.30
13885	10	Sliding lock spring	0.40
12831	11	Tailpiece	7.50
12832	12	Draft gear yoke	4.25
12833	13	Double coil draft spring	2.25
12834	14	Draft spring follower plate	2.50
12835	15	Double sliding clevis	2.00
12836	16	Chain guide with attachment bolts	0.75
12837	17	Uncoupling chain, 13 ft. long	$1.50
12838	18	Uncoupling hook with spring	1.50
13277	19	Uncoupling bracket with pin	1.00
12840	20	Uncoupling handle	0.30
13108	21	Pipe support	0.50
14965	22	⅝-in. repair link	0.06

Tomlinson M. C. B. Car Coupler

FORM 13

No.

14494— Complete M.C.B. Form 13 coupler equipment for single end with chain uncoupling, including coupler, draft gear, anchorage, unlocking chain with fittings, spring draw bar carrier, carrier slide bar and eight slide bar supports. $130.00

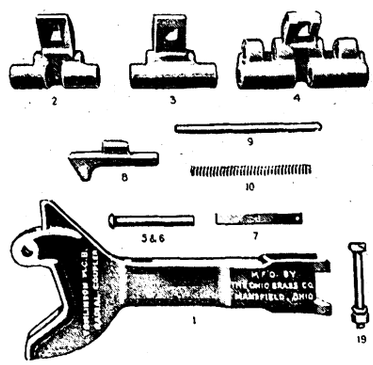
14523— Complete M.C.B. Form 13 coupler equipment for single end with lever uncoupling, including coupler, draft gear, anchorage, uncoupling device, spring draw bar carrier, carrier slide bar and eight slide bar supports.

Piece 11, Draft Gear

Tomlinson M.C.B. Car Coupler

FORM 13—REPAIR PARTS

Coupler Parts



Cat. No.	Part	Description	Charge
14495	1	Coupler body with knuckle springs	$30.00
10673	2	Standard split knuckle	9.00
11024	3	Solid knuckle	10.00
14485	4	High knuckle, 16 in	11.50
14236	5	Knuckle pin for standard knuckle	0.85
14486	6	Knuckle pin for high knuckle	0.90
14237	7	Knuckle spring	0.25
14497	8	Forged sliding lock	5.00
13884	9	Sliding lock pull rod	0.30
13885	10	Sliding lock spring	0.40
14498	11	Draft gear, complete	32.00
14499	12	Tailpiece	8.50

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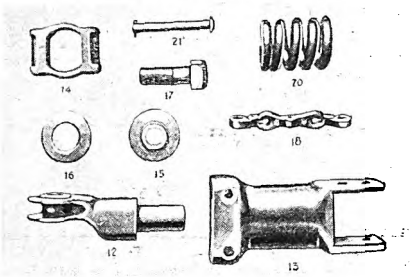
Electric Railway Journal Maintenance Data Sheet

ROLLING STOCK—STANDARDS—17

C.E.R.M.M.A. Uniform Charges—(Continued)

Tomlinson M.C.B. Car Coupler

Form 13—Repair Parts—(Continued)



Cat. No.	Part	Description	Charge
14500	13	Draft gear housing	$13.00
14501	14	Follower block	3.25
14502	15	Front follower	1.00
14503	16	Rear follower	0.80
14504	17	Draft bolt	1.00
14505	18	Pipe cleat with bolts and lock washers	1.00
14496	19	1¼-in.x9½-in. large bolt with nut and lock washer	1.25
14464	20	Draft spring	2.25
14471	21	Follower block pin with ½-in. cotter	0.50

Tomlinson M.C.B. Car Coupler

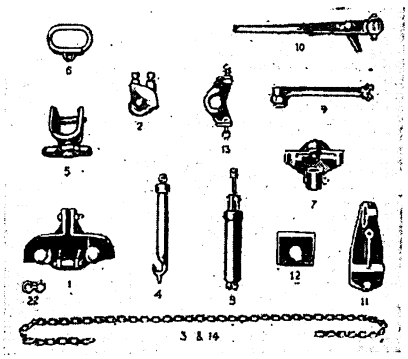
FORM 13—REPAIR PARTS

Chain Uncoupling Parts

Cat. No.	Part	Description	Charge
12835	1	Double sliding clevis	$2.00
12836	2	Chain guide with attachment bolts	0.75
12837	3	Uncoupling chain, 13 ft. long	$1.50
12838	4	Uncoupling hook with spring	1.50
13277	5	Uncoupling bracket with pin	1.00
12840	6	Uncoupling handle	0.30
14965	22	Uncoupling ⅛-in. repair link	0.06

Lever Uncoupling Parts

14524	7	Sliding clevis	1.30
14525	8	Spring barrel	1.65
14526	9	Center lever	0.85
14527	10	Side lever	1.60
14528	11	Side bracket	1.15
14529	12	Center bracket	0.30
14530	13	Chain guide	0.85
14531	14	Uncoupling chain, 7 ft. long	0.65



Tomlinson M.C.B. Car Coupler

FORM 22—REPAIR PARTS

No.
15206— Complete M.C.B. Form 22 coupler equipment for single end including coupler with draft gear, anchorage, uncoupling device, spring draw bar carrier and slide bar with supports $180.00

Cat. No.	Part	Description	Charge
15207	1	Coupler body with knuckle springs, sliding lock spring seat and channel support	$52.50
15208	2	Standard 16-in. nigh split knuckle	15.00
15209	3	1¼-in. high split knuckle	11.50
15210	4	Knuckle pin with ⅜-in. cotter for 16-in. knuckle	1.00
14458	4	Knuckle pin with ⅜-in. cotter for 1¼-in. knuckle	1.00
14237	5	Knuckle spring	0.25
15211	6	Forged sliding lock	6.50
15212	7	Sliding lock guide rod	0.65
15213	8	Sliding lock spring	0.25
15214	9	Sliding lock clevis with pin and cotter	0.75
14674	10	Draft spring—6½x8-in. Harvey	6.00
14675	11	Draft gear follower	2.50
14501	12	Draft gear follower block	5.00
15215	13	Draft gear bolt with ⅝-in. cotter	9.00
15216	14	Tailpiece	14.00
14471	15	Follower block pin with ½-in. cotter	0.50

(*Continued on next page*)

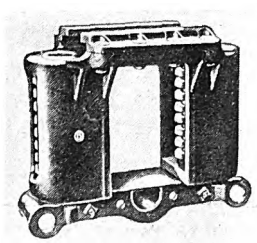
Electric Railway Journal Maintenance Data Sheet

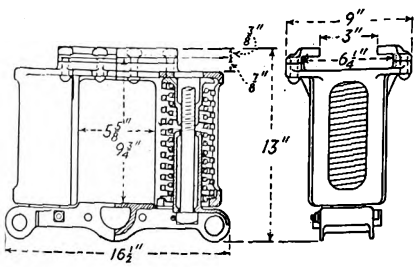
ROLLING STOCK—STANDARDS—19

C.E.R.M.M.A. Uniform Charges—(Continued)

M.C.B. Spring Draw Bar Carrier

FORM 14

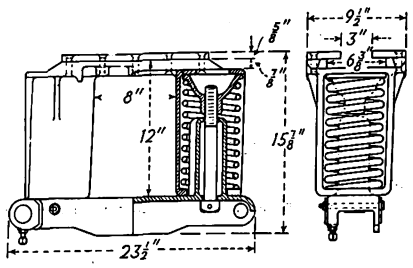


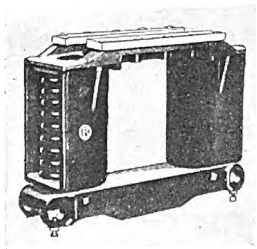


Cat. No.	Description	Charge
14429	Form 14 carrier for use with M.C.B. coupler	$18.00
14430	Body casting with jaws for Form 14 carrier	9.50
14431	Yoke casting for Form 14 carrier	3.50
13558	Outer coil spring for Form 14 carrier	1.00
14432	Inner coil spring for Form 14 carrier	0.75
14433	Jaws, front and rear, with rivets for carrier body, per pair	2.00

M.C.B. Spring Draw Bar Carrier

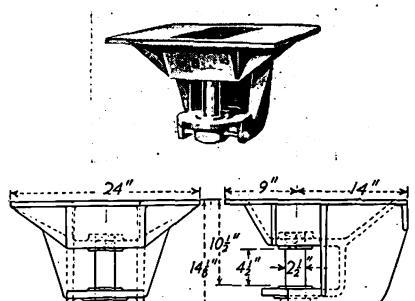
FORM 23





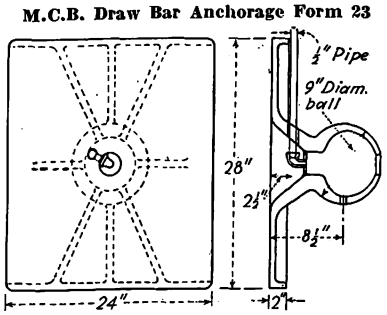
Cat. No.	Description	Charge
15233	Form 23 carrier complete	$34.00
15234	Body casting with jaws	17.00
15235	Yoke with clamping set screws and lock nuts	8.50
15236	Coil spring	0.85
15237	Jaw with rivets for carrier body, per pair	2.75
14781	Spring cap nut	1.25

M.C.B. Draw Bar Anchorage Form 22



15221 Form 22 anchorage complete $42.00
15222 Anchorage pin .....

M.C.B. Draw Bar Anchorage Form 23



15232 Form 23 Anchorage complete $37.50

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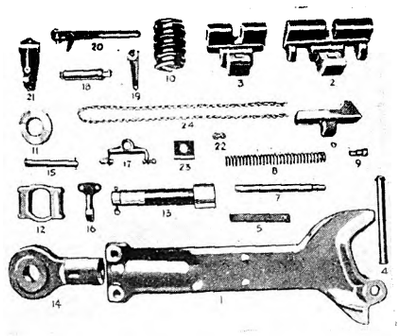
Electric Railway Journal Maintenance Data Sheet

ROLLING STOCK—STANDARDS—18

C.E.R.M.M.A. Uniform Charges—(Continued)

Tomlinson M.C.B. Coupler
Form 22—Repair Parts—(Continued)

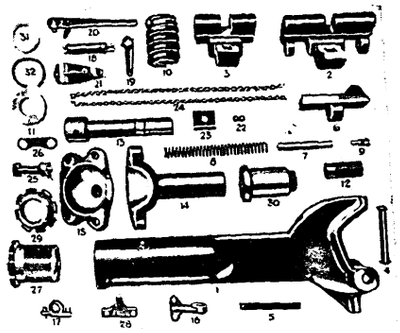


Cat. No.	Part	Description	Charge
15217	16	Pipe cleat	$0.65
15218	17	Chain guide with attachment bolts	1.00
15219	18	Spring barrel	4.25
15220	19	Center lever	0.65
14527	20	Side lever	1.60
14528	21	Side bracket	1.15
14529	23	Center bracket	0.30
14531	24	Uncoupling chain, 7 ft. long	0.65
14961	22	⅞-in. repair link	0.07

Tomlinson Form 23 M.C.B. Coupler
Repair Parts

No. 15223— Complete M.C.B. Form 23 coupler equipment for single end, including coupler with draft gear, anchorage, uncoupling device, spring draw bar carrier and slide bar with supports.....$230.00

Cat. No.	Part	Description	Charge
15224	1	Coupler body with knuckle springs, draft gear bushing and cnannel support	$57.50
15208	2	Standard 16-in. high split knuckle	15.00
15209	3	11½-in. high split knuckle	11.50
15210	4	Knuckle pin with ⅞-in. cotter for 16-in. knuckle	1.00
14458	4	Knuckle pin with ⅞-in. cotter for 11½-in. knuckle	1.00
14237	5	Knuckle spring	0.25
15211	6	Forged sliding lock	6.50
15225	7	Sliding lock guide rod	0.70
15226	12	Sliding lock guide tube	0.70
15213	8	Sliding lock guide spring	0.25
15214	9	Sliding lock guide clevis with pin and cotter	0.75
14674	10	Draft spring—6½x8-in. Harvey	6.00
14675	11	Draft gear follower	2.50
14670	14	Tail socket	20.00
15227	15	Tail socket cap	13.00
14672	25	Tail socket bolt with castle nut and cotter	1.00
14673	26	Tail socket shim	0.03
14676	13	Draft gear bolt	8.50
15228	27	Draft gear nut	8.50



Cat. No.	Part	Description	Charge
14678	28	Draft gear nut lock	$0.45
15229	29	Draft gear packing nut	3.00
15230	30	Draft gear bushing	9.00
14680	31	Draft gear packing ring	0.70
14681	32	Draft gear packing	0.30
15217	16	Pipe cleat	0.65
15231	17	Chain guide with attachment bolts	0.70
15219	18	Spring barrel	4.25
15220	19	Center lever	0.65
14527	20	Side lever	1.60
14528	21	Side bracket	1.15
14529	23	Center bracket	0.30
14531	24	Uncoupling chain, 7 ft. long	0.65
14961	22	⅞-in. repair link	0.07

Electric Railway Journal Maintenance Data Sheet

ROLLING STOCK—STANDARDS—20

C.E.R.M.M.A. Uniform Charges—(Continued)

EXHIBIT (D)
Buffalo Brake Beam Company, Buffalo, N. Y.
C.E.R. M.M.A. Standard Truck Parts

Per Car	Item	Description or Print	Charge Each
4	Spring shims	Oak 1½ x 11⅛ x 1 ft. 0 in.	$0.61
8	Dust guards	Print 1415577	0.25
8	Dust guard wedges	Cottonw. 1 7/16x1⅛x 0 ft. 9½-in.	0.13
4	Columns—R.H.	Print 5415305	6.36
4	Columns—L.H.		
8	Column bolts	1⅛x22¾ with nut	0.68
16	Journal box bolt	1⅛x16⅛ with nut	0.29
8	Brake beam hanger	Print 1415352	1.07
2	Lever guides	Print 1415351	0.80
2	Bottom connections	Print 1415358	2.96
8	Bottom arch bar guides	Print 1415356	0.32
4	Brake beam safety	Print 1415353	0.51
4	Bottom arch bars	Print 1415355	7.98
4	Top arch bars	Print 1415355	6.78
4	Tie bars	Print 1415355	2.16
2	Live levers	Print 1415349	1.67
2	Dead levers	Print 1415349	1.71
2	Spring planks	Print 1415354	8.23
16	Column bolt lock washers	Print 1415362	0.033
32	Journal box bolt lk. washer	Print 1415363	0.027
8	Brake beam hgr. pin L-6		0.258
10	Brake pins L-2¾	Print 1415357	0.202
2	Brake pins L-2¼— No rivets, nuts, bolts, cotters, etc.		0.21
8	Wheels	33-in. steel	*$37.50 †18.75
4	Axles	A. R. A. 5x9-in. rough turned.	*$30.00 †20.00

*New. †Second hand.

Per Car	Item	Description or Print	Charge Each
2	Bolsters	40-ton cast steel with integral ctr. plt. comp. with dead lever stop brkt. riveted on, per Gould Coupler Co's Pr. BO 4195-B	$68.58
8	Journal boxes	A.R.A. 5x9 mall. comp. with pressed steel top, hinge lid, for arch bar trk	8.24
8	Journal bearings	A.R.A. 5x9, lead lined	3.22
8	Journal wedges	A.R.A. 5x9, drop forged	0.75
8	Brake shoes	Reinf. steel back, flanged for A.E.R.A. 33-in. wheel	1.40
8	Brake shoe keys	Print 1413208	0.075

	Each	No. Required
No. 2 beams complete as shown print B-1402	$4.50	.....
Brake heads	1.00	2.00
Brake beam struts	1.00	1.00
Channel	0.95	0.95
Rods	0.95	0.95
Nuts	0.12	0.24
		$5.14

Per Car	Item	Description or Print	Charge Each
4	Springs	A.R.A. Std. class C, with spring plates	$6.30

F.o.b. destination in base territory.
Charges are per piece, not per truck, and pieces are shown as per car set, not per truck.

APPENDIX (E)
Car Body

86 No credit to be allowed for scrap lumber when renewing doors, floors, or other parts constructed in whole or in part of work.

95 Altering height of car body to keep couplers at proper height to be charged at cost.

106 Any car requiring general repairs due to owners defects on which the estimated cost of repairs exceeds $150 shall be inspected by the handling line and a careful estimate made of the cost of necessary repairs and forwarded to car owner, who will then inspect the car if he so desires, shall within thirty (30) days authorize repairs or further disposition of the car, shipping to handling line such material as he may see fit for use in repairing car. In case repairs are to be made by handling line.

107 In no case shall the total charge for actual repairs exceed the estimate by more than $50.00 unless authorized.

108 If the owner authorizes destruction of car, handling line shall allow credit for all material at scrap prices less labor required for destruction.

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Association Activities

International Association to Meet in Rome, May 6-12

THE Union Internationale de Tramways, de Chemins de Fer d'Intérêt Local et de Transports Publics Automobiles has set the days of May 6-12 for its meeting in Rome, Italy, this year. A feature of this meeting is that it will mark the consolidation of this association with the former Internationaler Strassen- und Kleinbahnverein. This means a return to the conditions existing before the war, when there was only one association representing the street railway, interurban railway and bus interests in Europe.

The detailed program of the Rome meeting will soon be made public.

A recent letter from the secretary of the association says the association would be very glad to have any members of the American Electric Railway Association participate in the Rome convention, and they are cordially invited to do so.

A preliminary program of the Rome meeting was published on page 278 of the issue of this paper for Aug. 13, 1927.

A.R.A. Motor Transport Men to Organize

PERMANENT organization of a Motor Transport Division of the American Railway Association will be effected at a meeting called for Jan. 25 and 26. It will be held at the Palmer House, Chicago. This meeting, which has been called by President R. H. Aishton of the A.R.A., will also give an opportunity for discussion of the scope of the work to be covered by the new division. The organization is in the hands of a general committee, of which A. P. Russell, vice-president New York, New Haven & Hartford Railroad, is chairman. G. M. Campbell, assistant to the secretary of the A.R.A., has been appointed secretary of the Motor Transport Division.

It is planned to distribute the activities of the Motor Transport Division of the American Railway Association among three sections, to study the application to steam railway service of the motor coach, the motor truck and the rail motor car respectively. The purpose of the organization wil be to bring together the railways interested in the development of motor transportation, freight and passenger, in order that they may study the problems arising therefrom, and, through co-operation, devise the most effective means possible for the development of such transportation. The membership in the division will be confined entirely to representatives of railways or their subsidiary operating companies.

COMING MEETINGS OF *Electric Railway and Allied Associations*

Jan. 16-17—Midwest Electric Railway Association, Arlington Hotel, Hot Springs, Ark.

Jan. 18-19—Kentucky Association of Public Utilities, annual meeting Brown Hotel, Louisville, Ky.

Jan. 18-19—Central Electric Traffic Association, Hotel Gibson, Cincinnati, Ohio.

Jan. 25—Central Electric Railway Master Mechanics' Association, Hotel Gibson, Cincinnati, Ohio.

Jan. 25-26—American Railway Association, Motor Transport Division, organization meeting, Palmer House, Chicago, Ill.

Jan. 25-27—Electric Railway Association of Equipment Men, Southern Properties, Roosevelt Hotel, New Orleans, La.

Jan. 26-27—Central Electric Railway Association, Hotel Gibson, Cincinnati, Ohio.

Jan. 31—New York Electric Railway Association, annual meeting, Hotel Commodore, New York, N. Y.

Feb. 13-17—American Institute of Electrical Engineers, winter convention, New York, N. Y.

Feb. 17-18—Central Electric Railway Accountants' Association, Hotel Gibson, Cincinnati, Ohio.

May 2-5—Southwestern Public Service Association, Dallas, Texas.

July 8-12—Public Utilities Advertising Association and International Advertising Exposition, Detroit, Mich.

SEPT. 22-28, 1928

American Electric Railway Association, 47th annual convention, Cleveland, Ohio.

American Association News

Engineers' Response Increasing on Letter Ballots

RETURNS on the letter ballots sent out by the American Electric Railway Engineering Association show increased response and indicate that as the new method of voting on engineering standards becomes better understood it promises to give far better results in the adoption of new engineering standards than did the old method of voting on the convention floor.

The first letter ballot, dated Sept. 17, included six standards that were submitted for approval. Three items were included in the second group of proposed standards in the letter ballot dated Nov. 2. The ballots received have all been counted. The returns on the second group were more than twice those received on the first group. The vote showed a large majority in favor of the adoption of the three recommendations submitted.

A third group of questionnaires is now before the engineers of the industry. These questionnaires are dated Nov. 25 and include rolling stock ballot R.S. 13, covering limits of wear at points affecting the maintenance of proper gear centers; way and structures ballot W.S. 2, covering minimum dimensions for center plates on single and middle frogs, and way and structures ballot W.S. 6, covering rules for arc welding and specifications for welding rods. Returns on this third group of ballots are coming in strongly and promise to exceed the returns received on the second group.

G. C. Hecker, special engineer of the association, who has charge of the compilation of these returns, reports that the response to this method of voting, as the use of the letter ballot becomes better understood, indicates that the new plan is working out successfully and promises to give a far more representative vote of the industry in the adoption of new standards than was formerly obtained in the old plan of voting on the convention floor.

Bulletin to Give Committee Lists

PUBLICATION of the membership lists of the various association committees will be in the form of a separate bulletin this year. This was decided on at a recent meeting of the publications committee of the American Association. This list will be accompanied by a general index of all committee members, giving their complete addresses and business connections. The committee lists will not be published in *Aera* each quarter as heretofore.

It is not expected that copies of the bulletin will be sent generally to *Aera* subscribers, but a copy will be sent to each committee member as well as to each company member. Additional copies will be sent to any other association member on request to J. W. Welsh, general secretary, 292 Madison Avenue, New York City

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News of the Industry

New York's Governor Discusses Home Rule and Buses

In his message to the Legislature of New York Governor Smith said:

This decade has seen several changes in our administrative policy toward public utilities. There is no need to rehearse the past. We have wavered from unified control to separation of functions. At present we have the Department of Public Service for state-wide regulation with the Transit Commission as a part of it having local jurisdiction in the city of New York. Construction of transit facilities in New York City is now entirely removed from state control and lodged in a local Board of Transportation. This is at least a partial recognition of the home rule principle.

All along I have stood for the right of a locality to regulate a public utility operating wholly within its borders upon the theory that the service is being rendered to the people of a single city and the elected officials of the city are held responsible in the first instance. The people look to them and not to the state. There is also no reason why the state should not delegate its police power for the regulation of public utilities to the properly elected officials of a municipality.

Transportation is so vital to the needs of every community that there is no reason why a municipality should not be permitted to supply it to its citizens. If that be true there is no reason why a city should not be permitted to operate public buses for the convenience and comfort of its citizens. There is nothing new or revolutionary about the theory of municipal ownership. New York City owns and operates ferry boats. Four cities of the state own and operate their electrical plants. A large number of villages either generate their own electricity or own a distributing system. Some villages operate gas plants. I simply recommend that the principle now in practice in New York City and in other parts of the state be extended to all forms of utilities and be made applicable to all cities wherever there is an expressed desire on the part of the majority of the citizens for the exercise of such a right.

Traction Not Included in Illinois Session

In calling a special session of the Illinois General Assembly to meet on Jan. 10, Gov. Len Small failed to include traction as one of the subjects to be considered. This makes it impossible to proceed with the proposed settlement of the Chicago railway problem prior to the regular session of the Legislature in 1929 unless another special session is called. It is being proposed that after the subjects in the present call are disposed of by the Legislature, another call should be issued by the Governor including all subjects relating to Chicago traction. There is considerable support of this plan in the city administration and the City Council has adopted a resolution urging the Governor to make such a call.

One of the subjects relating to traction may not be included. This is the proposed provision giving the city authority to spread special assessments for subway construction over a longer period than five years. Corporation Counsel Samuel A. Ettleson has found a provision in existing law which he believes gives the city this authority. For terminable permits, repeal of the existing 20-year franchise limitation and authority permitting the elevated and surface lines to consolidate, legislation is necessary under the plan being considered.

If another call is agreed upon including these subjects it can be issued before the end of the present special session, making consideration of transit really a continuation of this session. Decision on this matter rests entirely with the Governor, who has frequently stated that he would not call a special session unless both the utilities and the city were in agreement on the bills that are presented.

Continuation of Public Control Urged

Division of Metropolitan Planning would change name of Elevated to Boston Transit Company, realign financial structure and carry out plans for $40,000,000 expenditure

WITH more certainty of its facts and the legal status of its plans the Division of Metropolitan Planning of the Metropolitan District Commission has submitted to the Massachusetts Legislature for 1928 new plans for the expansion of the Boston Elevated, to cost about $40,000,000. Henry I. Harriman is chairman of the division, and associated with him are A. C. Ratshesky, Ralph S. Bauer, Richard K. Hale, Everett E. Stone, Frank H. Hall and James B. Noyes, and they are unanimous in their recommendations.

Two problems relating to the Boston Elevated Railway confront the Legislature. First, such legislation as is required to insure the immediate construction of much-needed additional rapid transit facilities, and, second, a determination of the policy of the Commonwealth as to continued public control of the road. Both of these problems were before the Legislature in 1927. The Supreme Court has said that the Legislature has the right to provide for the re-arrangement of the securities of the elevated road in the manner agreed upon last year in the joint legislative committee on metropolitan affairs and street railways. The Supreme Court has decided also that betterments may be assessed in connection with the rapid transit line extensions. This clears the way for legislation this year which could not be acted upon last year

The division reports that it cannot recommend the return of the road to the stockholders and the resumption of private management, cannot advocate the cancellation of a state option to purchase the road at millions less than its reproduction value and "cannot favor a policy which might foist increased fares upon the car riders of the Metropolitan District."

Accordingly, the division again reports in favor of a continuation of public control under somewhat new conditions which it deems equitable to both the public and to the company.

The bill which the division reports for the re-organization of the elevated railway contains the following important provisions:

1. A change of the name of the corporation to the Boston Transit Company.

2. An extension of the period of public control for a period of fifteen years, public control thereafter to be continued in force until repealed by legislative enactment.

3. The division feels that with an extension of public control for a period of 25 years or longer it would be reasonable to reduce the guaranteed dividend rate on the common stock to say 5½ per cent, thus effecting a saving of $125,000 per annum, but that with a shorter period of public control a reduction of the dividend rate is not warranted. While the saving resulting from a lower dividend rate on the common stock would be desirable, the division feels that the gain thus effected would not equal the advantage to the Commonwealth of being able to review the whole Elevated situation at the end of a fifteen-year period. Accordingly the division recommends a fifteen-year extension without a reduction in the dividend rate on the common stock.

4. The transfer of the three classes of preferred stocks now outstanding into income bonds, this being accomplished either by voluntary exchange or by eminent domain proceedings. The income bonds would bear interest at 4 per cent per annum, would be guaranteed by the Commonwealth as to both principal and interest, would be tax free in Massachusetts, would run for a period of 40 years and would carry a sinking fund that would retire them before maturity.

If 4 per cent income bonds are issued in exchange for outstanding preferred stocks on the basis hereinafter outlined the savings in dividends and in state and federal taxes will be about $1,175,000. This sum should be set up as a fund to be used for the following purposes:

(a) To create a sinking fund which will retire the income bonds at maturity.

(b) To retire the debt of $2,200,000

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which the Elevated now owes the cities and towns served by it.

(c) Any balance to be used for the payment of interest and sinking fund on additional rapid transit facilities.

5. In order that the income bonds to be issued under the proposed reorganization act shall sell at par it will be necessary that they carry the guarantee of the Commonwealth and that they be made tax free in Massachusetts.

6. Rotation in the term of service of the public trustees, one trustee being appointed every two years.

7. Acceptance by the elevated road of a bill calling for additional rapid transit facilities substantially as provided in the second bill accompanying this report.

8. Acceptance of this act by a majority of all the stockholders entitled to vote at a meeting held for that purpose, stockholders voting as a whole and not by classes.

The elevated road now has outstanding approximately $24,000,000 of common stock upon which 6 per cent dividends are paid and three classes of preferred stock, as follows:

First preferred 8 per cent stock	$6,400,000
Second preferred 7 per cent stock	13,650,000
Preferred stock 7 per cent	3,000,000
Total	$23,050,000

The dividends on these preferred stocks amount to about $1,675,000 a year. The $3,000,000 of 7 per cent stock is callable at 105. The first and second preferred stocks are not, however, callable and must therefore be acquired either by voluntary exchange or by eminent domain proceedings, and the bill accompanying this report provides for voluntary exchange, so far as the stockholders are willing to exchange, and for the condemnation of the balance of the stock.

The division suggests that the preferred stock be exchanged into 4 per cent income bonds, the bonds running for a period of 40 years, carrying a sinking fund which will retire them in that period, and having the guarantee of the commonwealth of both principal and interest. Last year the recommendation was for a 4½ per cent bond, but money rates are now easier. The division says it cannot be denied that thus far the state has treated the stockholders of the elevated both fairly and generously and it believes that fair dealing warrants the continuation of that policy.

Accordingly the division suggests that the owners of the three classes of preferred stock be permitted to exchange their securities into 4 per cent income bonds at the following share prices:

8 per cent first preferred stock	130
7 per cent second preferred stock	115
7 per cent preferred stock, its call price of	105

These prices are substantially higher than present market quotations and in the opinion of the division should be attractive to the stockholders of the road.

As the division sees it, an exchange of the preferred stocks on the above basis would call for the issuing of a little less than $27,200,000 of bonds, upon which the maximum interest charge would be about $1,100,000, thus effecting a saving of $575,000 over the present dividends on the preferred stocks.

The division estimates the savings as follows:

Dividends on preferred stocks	$575,000
Federal taxes	260,000
State corporate franchise tax	340,000
Total	$1,175,000

Of the above savings $300,000 a year should be set aside as a sinking fund to retire the new income bonds of the road. An annual sinking fund of that size invested in the income bonds, which should be callable for the sinking fund, will retire them by the end of the 40-year term for which they are to be issued. The division says:

The elevated road now owes the cities and towns served by it approximately $2,200,000. This represents moneys which the cities and towns advanced through the Commonwealth to the elevated to meet the guarantees of the public control act when its earnings were insufficient. This money should be promptly repaid. We accordingly recommend that, after setting aside the sinking fund of $300,000 as above provided, the balance of the savings effected be first used to repay this debt to the cities and towns. When that debt has been repaid, we recommend that the savings thereafter be set up in a reserve fund which shall be used to pay the interest and sinking fund on additional rapid transit extensions. Any rapid transit extensions will necessarily take several years for construction and during the construction period, the interest and sinking fund on such expenditures are carried as a part of the construction cost. Accordingly the debt to the cities and towns can be repaid before any lease by the elevated of new rapid transit facilities goes into effect.

The total annual savings to be effected by the plan outlined in this report are estimated at $1,175,000. From this saving must be taken the $300,000 required for the sinking fund for the income bonds. There will thus be left $875,000 which can be applied to the payment of interest and sinking fund charges on new subways and rapid transit facilities. This means the carrying charges on approximately $20,000,000 of such expenditure and makes possible the immediate construction of new subways.

Turning to the question of extension of lines the division finds that a comprehensive rapid transit plan can now be authorized with every prospect that it will not add any burden to the car riders of the Metropolitan area. It accordingly recommends the immediate construction of two new through rapid transit routes which can be built at an estimated cost of from $35,000,000 to $40,000,000, and also an extension of the Washington Street rapid transit route from its present northerly terminus in Everett to Malden and Saugus.

The total length of the two lines is approximately 14 miles, of which about 27,500 ft. will be existing subways or viaducts, 25,000 ft. new subways or viaducts and 20,500 ft. on private rights-of-way adjacent to railroads.

Chicago Parking Ordinance Effective Jan. 10

To enforce the prohibition of parking in the loop district in Chicago will require the service of at least 400 traffic policemen, according to Frank J. Matchett, head of the police traffic division. The ordinance prohibiting parking was intended to become effective on Jan. 2, but because of time required for publication it will not go into effect until Jan. 10. Under the terms of the ordinance, parking will be barred from practically the entire central business district. It is the intention of city authorities to apply the law strictly to all persons and not to permit anyone to park on the streets affected during the time specified, from 7 a.m. to 6:30 p.m. on weekdays, except Saturday.

A Magazine in St. Louis Seeks a Name

A new monthly magazine will be published in the interest of employees of the St. Louis Public Service Company, St. Louis, Mo., in lieu of the United Railways *Bulletin*, which was withdrawn from publication at the end of the receivership on Nov. 30. Suggestions for a name must be in the hands of the editor of the magazine not later than Jan. 15 in time to publish the first issue of the book under its new title in February. The best choice of name will win $25 in cash and there will be a second and a third prize of $15 and $10. Only street railway employees not holding official positions and members of their families or especially foremen, supervisors, inspectors, motormen and conductors and other employees are eligible to compete for the prizes. Meanwhile the space for the title on the cover page was vacant in the December issue and will be also in the January issue.

Carols from a Houston Car at Christmas

During the week preceding Christmas, residents of Houston, Tex., were treated nightly to Christmas carols provided by the Houston Electric Company, working in conjunction with the musical section of the recreation department of the city. A specially decorated flat car, with a different band each night, was routed over various lines so that the entire city was covered during the week. This unusual way of lending atmosphere to the Christmas season attracted much attention and many families in the residential sections of the city waited up to greet the carolers while in their neighborhood.

Three days before Christmas all the cars and buses of the Houston Electric Company were decorated inside with paper bells and wreaths, while appropriate dash posters were run on the outside of the cars.

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Paving and Fare Orders in Mobile

The Alabama Public Service Commission has issued an order allowing the Mobile Light & Railroad Company to take up the track and abandon service on the 2,331 ft. of route of the Charleston-Beauregard line on Texas Street, Mobile, Ala. It is the intention of the city to pave Texas Street and as the Charleston-Beauregard line is an unprofitable one the commission issued the order to give the company relief from paving.

The commission also increased the token rate from four tokens for 28 cents to four tokens for 30 cents. Rates of fare now are: Cash fare, 8 cents; token fare four for 30 cents, 7½ cents; school tickets, books of 30, 3½ cents; second zone, cash fare, 6 cents, and transfers, each 1 cent.

Twin City Lines Extends Xmas Greetings

An unusual Christmas greeting in the form of a newspaper advertisement, entitled "What He Left Behind Him," was extended by the Twin City Lines to all of its patrons. The message printed the last will and testament of a patient in a Chicago poorhouse which was found in his ragged coat pocket. Close investigation disclosed that the writer had been a lawyer and because of its unusual content, the will was probated and made part of the record of Cook County, Illinois. The old patient, Charles Lounsberry, made no disposition of his worldly goods as he had none to leave, but he left something to good fathers and mothers in trust for their children; he left wonderful things to children but only for the term of their childhood, also to lovers and young men, and to those who were no longer children or youths or lovers, he left memory. The message is worth reading and the spirit of the Twin City Lines in offering this as its Christmas greeting is worth emulating.

Who Is a Nominee in Louisville?

Each employee of the Louisville Railway, Louisville, Ky., has been urged to bring to the attention of the award committee, on a form which may be obtained from his foreman, the record of any fellow employee whom he feels is entitled to the Anthony F. Connelly award for the designation "Best Public Servant." All employees are urged to state as fully as possible the reason for their belief that the nominee has rendered the greatest public service during the past year. Nominations can be made any time up to Jan. 10 and the award committee will make its selection and announce the award as early as it is possible to do so. This award carries an annual cash prize of $75 and a medal known as the Connelly award, to be given to that employee of the Louisville Railway or one of its subsidiaries who has during the calendar year rendered, in his individual capacity, the most useful or efficient service to the public which the railway serves.

An Ingenious Plan to Return to the Five-Cent Fare in Seattle

Return of the 5-cent fare on the Seattle Municipal Railway, Seattle, Wash., again becomes a possibility. First steps have been taken to place before the voters of the city a definite proposal for assistance for the municipal railway from the general fund. A "plan or system" ordinance authorizing a tax levy up to 3 mills has been prepared by Corporation Counsel T. J. L. Kennedy and turned over to Councilman Oliver T. Erickson, sponsor of the idea, for introduction in the City Council. It is proposed to place this plan before the voters at the March 13 election. If the ordinance is ratified by a three-fifths vote, it will enable the Council to proceed with the new plan. Under the proposed plan, the Council would be empowered to aid the railway annually with money from the general fund to make up deficits anticipated during the year, provided the appropriations did not exceed 3 mills of the tax levy.

Educational Films Supplied by South Shore Line

Establishment of a motion picture library and free lecture service—available without charge to any individual or organization that applies—has recently been announced by the Chicago, South Shore & South Bend Railroad, Michigan City, Ind. The service includes the furnishing of a trained speaker and operator, projector, screen and a representative selection of films telling the story of cities, recreational opportunities and industries along the South Shore Line.

Titles of the films now available are as follows:

Chicago, the Metropolis of the Midwest (2 reels).
Gary, the Steel City.
Michigan City, the Summer Resort Capital of Indiana.
South Bend, in the Beautiful St. Joseph Valley.
Vacationland Along the South Shore Line.

Two stereopticon films, furnished with the same accompanying service as the motion pictures are ready for release to persons interested: "Our Silent Guardians," a non-technical series describing the operation of South Shore Line automatic block signals; and "Riding on Lightning," a description of the electrical equipment of South Shore Line cars, also presented so as to be readily comprehended by the layman. Bookings for films and lectures are made through the newly organized Public Speakers' Bureau of the South Shore Line.

Transit Policy in Philadelphia Outlined

Upon his induction into office as Mayor of Philadelphia, Pa., Mr. Mackey promised the negotiation of a transit agreement in harmony with the Philadelphia Rapid Transit Company and in co-operation with the Council and the Public Service Commission. He said that of all the problems confronting the administration local transportation was the most important. He believed that Philadelphia to become a greater commercial center must improve and enlarge its transportation facilities. The task had already been simplified by the work done by the present management of the Philadelphia Rapid Transit System, which during its period of incumbency has converted the system from the poorest to one of the best and most efficient. He said he would be guided in the matter of transit by the facts in the case, but that he was convinced that he could rely upon the co-operation of the railway management in furthering any program which had for its object the greatest good for the greatest number.

Specifically speaking, he said that the Broad Street subway should be put in operation as a part of the Philadelphia Rapid Transit System with free transfers. Early completion of feeder lines and adequate downtown terminals were necessary, and in order that the time of the administration spent in negotiation with the company might not be nullified by subsequent disapproval by the Public Service Commission he proposed to invite the commission and the company to collaborate in bringing forth a plan fair to both the city and the company, and to this end he bespoke the co-operation of the City Council.

Turkeys and Hams Awarded in Jacksonville

Another successful safety contest for trainmen of the Jacksonville Traction Company, Jacksonville, Fla., has closed. John P. Ingle, manager of the railway, said the contest revealed that accidents are on the decrease and that the contest was the most successful in the history of the company. As an appreciation for the records made during the 100-day contest, 114 trainmen were presented turkeys for Christmas and 32 conductors received hams.

The contest developed two star operators, R. T. Chism and L. Lammons, who operated more than 9,000 miles each without a single chargeable accident. Winners operated for approximately 275,000 miles during the drive, which opened Sept. 10, at the close of a successful mid-summer campaign. The present drive closed Dec. 18. While more than half of the men who participated in the company's latest drive won first honors, seventeen men were eliminated because they did not work the required number of days, and 23 lost because of chargeable accidents.

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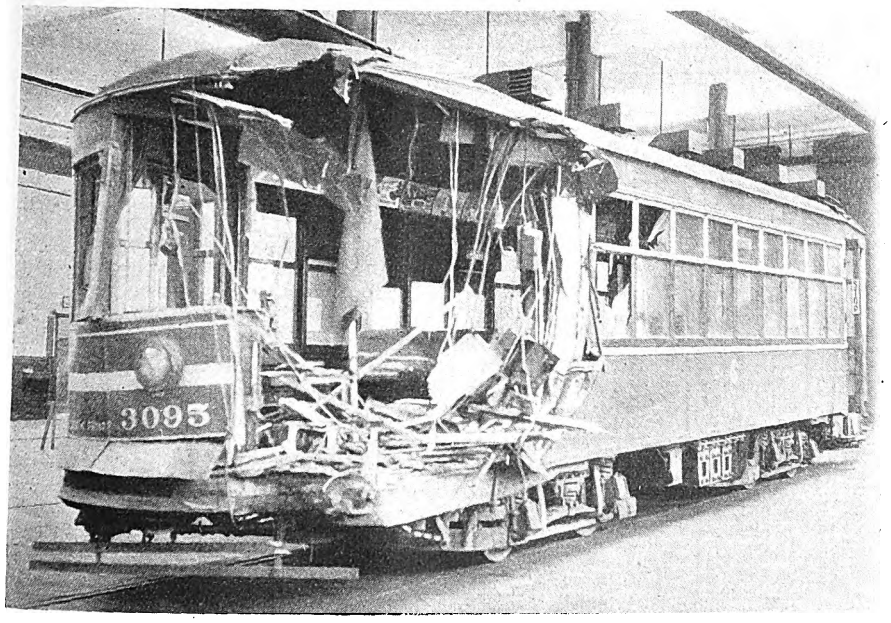
More Records in Chicago

29,576,412 rode Chicago Surface Lines in six days preceding Christmas. 100 per cent operation

WHEN the Chicago Surface Lines attained 100 per cent operation in the Christmas shopping peak of 1926 the feat was recognized as an unusual achievement for a large electric railway system. During the week before Christmas in 1927, however, the company not only duplicated its previous record but succeeded in maintaining 100 per cent operation of all passenger equipment on three days.

On Wednesday, Thursday and Friday, Dec. 21, 22 and 23, every one of the 3,639 passenger cars owned by the company was in service on the streets during the heaviest peak-load periods. On Monday, Dec. 19, all but eight of the cars were in service and on Dec. 20, only one car was laid up for repairs.



In perfect condition four days after, for Christmas rush

The greatest effort and co-operation by the transportation, shops and equipment, track and emergency departments were required to accomplish this.

New records were made by the shops and equipment department in repairing damaged cars. For instance, car No. 3,095 was struck by a skidding cement truck on Dec. 17 and the entire front vestibule was demolished. The accompanying illustration shows the seriousness of the damage done to this car. It was put into the shops at once and a crew of men started working on it. On Wednesday, Dec. 21, it was returned to service in good condition as the result of 735 hours of labor.

Another instance of quick repair work is reported in the case of car No. 5779. At 2:55 p.m. on Dec. 21 an axle on this car was broken in an accident. Instead of hauling the car to the shops an emergency crew took it off the rails and placed it against the curbing, leaving the tracks clear for traffic. New axle and wheels were rushed to the place with a repair crew and at 4:20 p.m.—in one hour and 25 minutes—the car was put back and sent on its way.

In all, there were six cases of heavy damage to cars requiring the repair or replacing of front ends. In each instance repairs were made quickly and the cars returned to service.

Equal efficiency was shown by the employees of other departments. Trainmen were alert to avoid accidents which might disable cars and to make such minor adjustments and repairs as were necessary to keep them running. Emergency crews did splendid work in preventing serious delays.

During the six days preceding Christmas 29,576,412 rode on the system, an increase of 2,663,049 over the corresponding days in 1926. Adverse weather conditions tended to delay Christmas shopping in Chicago and the huge increase in riding during the week before Christmas is attributed largely to this fact.

The 100 per cent operation of equipment on three days enabled the system to handle this enormous load with minimum congestion and maximum speed.

Officials estimate that by being able to use all equipment in the Christmas peak they saved the investment necessary for 200 additional cars the number usually going through the shops. The cost for car and car storage would average about $20,000, making a total saved in capital investment of approximately $4,000,000.

Use of One-Man Cars Extended in Springfield

The Springfield Street Railway, Springfield, Mass., made a further extension of the one-man car system when its Forest Park line was put on that basis recently.

Improved Service in St. Louis

The St. Louis Public Service Company, St. Louis, Mo., which promised the car riders better service when it took over the street car system on Dec. 1, has already taken several steps toward making good the pledge. As a result of a survey into street car traffic 30 additional cars will be placed in service on the Olive, Hodiamont Southampton and Grand lines. A study of the transportation needs of other divisions is now under way.

A new form of transfer was also put in use at midnight Dec. 31 to facilitate the handling of traffic during rush hours and at all other periods. This transfer differs from the old in that when a double transfer is needed the second conductor simply will tear off a stub instead of issuing a new transfer as formerly. The colors of the new transfer are white and red, as under the old system, but contain the words "down" and "up" on their face. The "down" transfer is used for passengers going downtown and on southbound crosstown cars, while "up" transfers are used for trips away from the downtown district and on northbound cars.

Another innovation which is being tried out by the St. Louis company is a stop light for street cars similar to those used by automobiles. The stop light is now being used on only one car, but if it is sufficiently advantageous similar lights will be installed on all cars.

Appeal Filed in Seattle-Von Herberg Tangle

An appeal from the decision of Circuit Judge Frank S. Dietrich who dismissed the Seattle Municipal Railway litigation in the federal courts has been filed by attorneys for John G. Von Herberg, despite the request of the City Council and numerous business men of the city to Mr. Von Herberg to drop the case. The suit was instigated against the city to test the legality of the purchase and bond ordinances giving the bondholders prior lien against the gross revenues of the street railway system. Judge Dietrich, sitting as district judge, heard the arguments in the suit brought by Mr. Von Herberg and also the suit brought by the Puget Sound Power & Light Company, involving the railway system, and sustained a motion to dismiss.

Eight Cents Sought in Joplin

The Southwest Missouri Railroad through its receivers F. C. Wallover and H. C. Rogers has applied to the Missouri Public Service Commission for authority to increase the fares in Joplin, Mo., from 5 cents to 8 cents or two tickets for 15 cents. During the past year under a 5-cent fare the deficit was more than $20,000 it is claimed. Federal Judge Merrill Otis authorized the receivers to ask for a higher fare.

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Recent Bus Developments

Bus Operation Planned on Plymouth & Brockton

The Plymouth & Brockton Street Railway, operating a line between these two points in Massachusetts, is planning to abandon service. Parts of the line have been served by buses and it is now the plan to conduct the business in its entirety as a bus proposition. Just as soon as the necessary licenses demanded by bus laws can be secured from the various towns through which the line passes, the change to bus operation will be made.

When the line was built in 1889 it operated a distance of 4½ miles and was known as the Plymouth & Kingston line. Later the name was changed to the Brockton & Plymouth Street Railway and still later became known as the Plymouth & Brockton Street Railway. The line was in financial distress about ten years ago and patrons were called upon to lend their aid.

Bus Permit Denied Olympia Traction Property

The Department of Public Works has denied the application of the Pacific Northwest Traction Company for a certificate to operate motor passenger and express service between Seattle and Everett over the much-coveted new Pacific highway route, and has granted a permit to B. Krakenberger for the service. In refusing the traction company's application, the department said:

> The deduction seems warranted that it has operated its bus service, not for the convenience of the public, but for the convenience and protection of its electric railway.

Both electric railway and motor service, the latter over the old Seattle-Everett Highway, are supplied by the traction company. Citing as proof that the applicant discriminated in favor of the railway, the department said that the train fare between Beverly Park and Everett, a distance of 3 miles, was 10 cents, and the stage fare 20 cents. The company immediately appealed from the order of the department and writ of review and supersedes bond order in the sum of $5,000 were issued by Judge John M. Wilson of the Thurston County Superior Court. The writ is made returnable on Jan. 23.

No Relief for Ohio Commission on Bus Cases

An opinion just handed down by Attorney-General E. C. Turner of Ohio has dealt a blow to the plan to relieve the Public Utilities Commission of Ohio of a vast amount of work in connection with the motor bus franchise and rate cases. The plan had been to use attorney examiners to handle these cases for the Utilities Commission. The Attorney-General in a ruling to the commission says that no money can be authorized for paying for transcribing records in cases investigated by the attorney examiners. There are two possible cures for this situation. There could be action by the emergency board, or by a special session of the State Legislature. Gov. A. V. Donahey has indicated that for the present, at least, he has no intention of calling a special session. Officials are inclined to believe, however, that the emergency board may act.

Emergency Bus Ordinance Authorized in Portland

An emergency ordinance was granted to the Southern Pacific Company by the City Council of Portland, Ore., to operate certain buses which have been substituted for eleven Red Electric trains, formerly used to serve suburban districts. The new ordinance gives the company permission to operate its buses at the Fourth and Stark Street station in the center of the city and to make stops with these buses for picking up and discharging passengers at any other Southern Pacific station in Portland.

Passenger Traffic Gain on New York Suburban Line

Lower commutation rates, the installation of new trains and the establishment of "feeder" motor coach lines contributed to a 12.6 per cent increase in passenger traffic over the New York, Westchester and Boston during the first six months of 1927, as compared with the period in 1926.

Between Jan. 1 and June 30 this year the railway carried 6,301,045 passengers. This represented a gain of 705,090 or 12.6 per cent over the figures reported for the first half of 1926 and marked a new record business for the road. The greatest percentage of gain, 14.29, was registered in the 60-trip commutation class of traffic.

June also set a new record. In carrying 1,106,807 passengers the railroad not only exceeded the million-a-month quota for 1927, but also exceeded by 81,040, or 7.9 per cent, the June, 1926 figure. During June, however, the greatest percentage of increase, 9.84, was in the single-trip class of riders, indicating the growing popularity of the railroad among intracity travelers.

The squadrons of motor coaches recently put into service by the County Transportation Company, a subsidiary of the New York, Westchester & Boston, to replace, in Connecticut and in various sections of Westchester bordering Long Island Sound, the trolleys of the New York & Stamford Railway, another subsidiary, are proving so popular that additional coaches have been ordered for this "feeder" system.

Motor Transport Division for Steam Railroads

Due to the growth and increasing importance of the bus and truck as an adjunct of railroad transportation, a new division of the American Railway Association, known as the Motor Transport Division has been created. Membership in the division will be confined entirely to representatives of the railroads or subsidiaries in the United States, Canada, Mexico and Cuba. Headquarters of the division will be at the offices of the American Railway Association, 30 Vesey Street, New York. A. P. Russell, Boston, vice-president of the New York, New Haven & Hartford Railroad and president of the New England Transportation Company, which operates the buses of the New Haven system, has been appointed temporary chairman. George M. Campbell, New York, assistant to the secretary of the American Railway Association, will be secretary of the division.

The purpose of the organization is to bring together the railroads interested in the development of motor transportation, whether freight or passenger, in order to study the problems arising therefrom, and through the co-ordination of the rail carriers, to devise the most effective means possible for the development of such transportation.

The work of the Motor Transport Division will be divided into three sections, one to the study of the application of the bus to the use of steam railroads, another to the study of the application of the motor truck to the use of steam railroads, and the third to the application of the rail motor car to the use of steam railroads.

The first meeting of the Motor Transport Division will be held in Chicago in January at which time a permanent organization will be perfected and discussed. Its creation is the outgrowth of the Railroad Motor Transport Conference organized in August, 1926, by approximately 50 railroads, which were at that time interested in the development of buses and trucks.

Pittsburgh Bus Route Extended

The present Point Breeze route of the Pittsburgh Motor Coach Company, subsidiary of the Pittsburgh Railways, Pittsburgh, Pa., was extended Dec. 12, 1927, to Penn and Center Avenues, Wilkinsburg, and is known as "Wilkinsburg." Operation of the present Point Breeze route on Dallas Avenue from Penn Avenue and along Thomas Boulevard will be discontinued. The fare will be 25 cents one way with tickets for convenience on sale by the operator at 21 for $5.

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Financial and Corporate

Huntington Properties Change Hands

City and interurban lines in West Virginia pass from Appalachian Electric Power to Central Public Service Corporation

ELECTRIC railway properties in Huntington, W. Va., and the urban and the interurban lines between Huntington and Ironton, operated by the Ohio Valley Electric Company, have changed hands. That fact was made known on Dec. 30 by W. R. Power, division manager of the Appalachian Electric Power Company. The trackage totals 54 miles. The deal also includes the Ohio Valley Bus Company.

The transfer was effected through a sale of the stock of the Ohio Valley Electric Railway by the Appalachian to the Central Public Service Corporation, Chicago, of which A. E. Pierce is president. He formerly resided in Huntington while he owned and operated the Huntington Development & Gas Company.

Simultaneous with the Huntington announcement came word that the Chicago corporation had also acquired control of the electric railway systems in Portsmouth, Ohio, and Wildwood, N. J., and the electric company in Rockford, Ill.

Mr. Power was advised of the consummation of the deal in a telegram from George N. Tidd, New York, president of the American Gas & Electric Company, of which the Appalachian Electric Power Company is a subsidiary.

With the sale of its transportation lines, the American company will derive virtually all its gross income in the Huntington section from electric power and light operations. Its electric properties in all cities except Rockford are retained.

It was in 1899 that the historic Consolidated Light & Railway Company, headed by the late J. L. Caldwell, operated the first electric car between Huntington and Guyandotte. This company subsequently built other lines within the city. It remained for the late Johnson N. Camden and his associates to secure control of the various electric railway interests in Huntington, Ashland and Ironton and to link them together in one interurban system under the ownership of the Camden Interstate Railway. Senator Camden completed the last link in his system in 1900.

In 1902 the company was purchased by Colonel John Graham and sometime thereafter the company became the Ohio Valley Electric Railway. Colonel Graham sold the properties in 1907 to W. X. Sproul, afterwards Governor of Pennsylvania, and a group of associates. The Sproul interests sold to the American Railways in 1912.

In the next few years the commercial power business began to loom large and the American Railways became the American Electric Power Company. In 1923 the American Gas & Electric Company became the general holder of large power interests including those in this section now operated by the Appalachian Power Company.

Missouri Utility Stock Sought

The City Utilities Company, St. Louis, Mo., has asked the Missouri Public Service Commission for authority to hold more than 10 per cent of the stock of the St. Louis Public Service Company and of the Kansas City Public Service Company, both of which were reorganized by Newman, Saunders & Company, Inc. A Missouri statute prohibits a foreign corporation from holding more than 10 per cent of the stock of a Missouri public utility without the permission of the state commission. Col. Albert T. Perkins, former general manager of the St. Louis railway system and now vice-president of the City Utilities Company, said the company would hold 40 per cent of the common stock of the St. Louis company and 25 per cent of the Kansas City stock if permitted.

Loss on San Francisco Municipal $240,228

For year ended June 30, 1927, the system sustained this loss after allowing for the deduction of charges comparable to those a private system would have to meet

TOTAL revenue of the Municipal Railway of San Francisco, San Francisco, Cal., for the year ended June 30, 1926, was $3,420,074 against $3,409,965 the year before. Interest on securities owned was $46,641. A consideration of detailed operating expenses shows an increase in every account except one, leaving the total of $2,879,905, or $274,759 greater than in the year 1926.

The report is prepared for and approved by the finance committee of the Board of Supervisors. For the purpose of securing a comparison between the results of operation of the municipally owned utility and similar utilities operated by private capital the charter of the city and county of San Francisco provides that the operating reports should include certain comparison charges consisting of items which constitute part of the actual cost of operating privately owned companies but

COMPARATIVE INCOME ACCOUNT MUNICIPAL RAILWAY OF SAN FRANCISCO

	Year Ended June 30 1926	1927	Dec. 28, 1912 to June 30, 1927
Passenger revenue	$3,395,950	$3,398,187	$35,477,710
Miscellaneous revenue	14,015	21,887	159,373
Total revenue	$3,409,965	$3,420,074	$35,637,083
Interest on securities owned	43,467	46,641	451,378
Total income	$3,453,432	$3,466,715	$36,088,461
Operating expenses:			
Way and structures	$134,911	$144,876	$1,194,781
Equipment	200,365	212,597	2,106,069
Power	488,812	488,143	4,811,651
Conducting transportation	1,694,704	1,843,837	16,139,161
Traffic	.....	423	4,260
General and miscellaneous	186,351	190,027	1,525,658
Loss on road retired	.....	.....	8,184
Total operating expenses	$2,705,146	$2,879,905	$25,789,767
Excess of income over operating expenses	$748,286	$586,810	$10,298,694
Deduct: Interest on funded debt	177,133	167,768	2,906,542
Excess of income over operating expenses and interest	$571,153	$419,041	$7,392,152
Deduct: Provision for depreciation	$398,789	$247,362	$3,917,296
Provision for accidents	106,088	84,954	670,984
Total	$504,877	$332,316	$4,588,281
Profit from operations, before deduction of comparative charges required by charter	66,275	86,724	2,803,870
Deduct comparative charges as required by charter:			
Taxes	318,009	318,271	3,148,672
Fire insurance	4,951	5,138	67,058
Total	$322,961	$323,409	$3,215,731
Income, after deduction of comparative charges	*$256,685*	*$256,684*	*$411,860*
Charges to income	.....	25,278	62,948
Total	*$256,685*	*$261,962*	*$474,808*
Credits to income	.....	21,734	161,075
Net income	*$256,685*	*$240,228*	*$313,733*

Italics indicate loss or deficiency.

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STATISTICAL DATA MUNICIPAL RAILWAY OF SAN FRANCISCO ENDED JUNE 30, 1927

	Total Amount	Per Car-Mile	Per Car-Hour
Passenger revenue	$3,398,187.05	0.3604	3.4819
Operating expenses	2,879,905.64	0.3054	2.9509
Interest on funded debt	167,768.33	0.0178	0.1719
Provision for depreciation	247,362.24	0.0262	0.2535
Provision for accidents	84,954.69	0.0091	0.0870
Taxes (comparative charge)	318,271.27	0.0337	0.3261
Fire insurance (comparative charge)	5,138.13	0.0005	0.0053
Net loss	*240,228.53*	*0.0255*	*0.2461*
*Passenger car mileage	9,428,522.00		
†Passenger car hours	975,949.00		
Platform expense	1,542,955.35	0.1636	1.5810
No. of passenger cars owned	224		
No. of work cars owned	6		
Total number cars owned	230		
Total number of buses owned	19		
Total number of cars and buses owned	249		
‡Revenue passengers carried	68,820,375	7.2992	70.5163
Free transfer passengers carried	14,240,492	1.5104	14.5914
Free passengers	542,785	0.0576	0.5562
Total passengers carried	83,603,652	8.8672	85.6639

* Includes bus mileage of buses.
† Includes bus hours of buses.
‡ Transfers lifted at Fillmore and Union Streets treated as revenue passengers pending the result of present litigation with the Market Street Railway.

which the municipally owned utility is not required to pay. These charges in 1927 amounted to $318,271, leaving a net loss of $240,228 for the year. The deficit in the cumulative account from Dec. 28, 1912, to June 30, 1927, was $1,885,606.

Items in the balance sheet are listed in detail. Capital assets include road and equipment, $8,636,839, and general expenditures, $324,872, and construction work in progress, $7,422, making the total property investment $8,969,134. Thus the total assets was $11,080,168. The items in the balance sheet were condensed for reproduction in the table that appears elsewhere on this page.

Total bus mileage is 11.89. That of the railway was more than 74 miles.

Under the heading cash and securities with treasurer are grouped cash and securities held by the treasurer of the city and county of San Francisco for and on account of the municipal railway.

Change in Procedure on Accident Prevention Reserves

Funded debt unmatured stood at $3,295,000. This amount represents the par value of unmatured bonds outstanding at June 30, 1927.

Reserve for accidents stood at $116,774, made up as follows:

Accident Reserve Fund:		
Cash with Treasurer	$29,491	
Less: Warrants Payable	8,319	
Available Cash		$21,171
Securities with Treasurer		95,603
Total		$116,774

The accident reserve fund was established by ordinance passed by the Board of Supervisors on April 19, 1926. According to the terms of the ordinance, 2½ per cent of the gross passenger revenue must be set aside for the purpose of paying claims for accidents and damages resulting from the operation of the municipal railway (other than accidents to employees) and expenses incidental thereto such as expenditures of claim and legal departments. During the period under review, the sum of $84,954 was transferred to this fund to take care of the provision which has just been outlined.

Reserve for accrued depreciation of road and equipment stood at $3,834,891. This amount represents the accumulated provision for depreciation of road and equipment as prescribed by ordinances, less charges thereto on account of depreciation previously set up on those assets which have been retired. Ordinance No. 3109 N. S. provided that 18 per cent of the gross passenger revenue should be set aside each year to meet all charges on account of depreciation and to pay the principal of the bonded indebtedness incurred in the construction of the railway. This ordinance was made retroactive to Dec. 28, 1912, and its provisions were compiled with until April 30, 1926, when it was repealed by ordinance No. 7060 N.S. Ordinance No. 7060 N.S. provides that 3 per cent of the cost of road and equipment shall be set aside each year to meet all charges arising on account of depreciation of road and equipment. Thus no uniform annual rates of depreciation based on cost were adopted until April, 1926.

The difference between the balance in this account and the net provision, as disclosed by the table that is contained in the pamphlet report is as follows:

Net provision for depreciation as disclosed by table		$3,917,296
Less: Provision for depreciation applicable to assets retired:		
Fiscal Year ended June 30:		
1921	$2,063.61	
1923	30,650.00	
1924	1,082.50	
1925	4,960.00	
1927	43,649.25	82,405
Balance per books, June 30, 1927		$3,834,891

Condensed Comparative General Balance Sheet Municipal Railway of San Francisco as of June 30, 1927

Assets:	1927	1926
Capital assets	$8,969,134	$8,570,280
Current assets	2,026,605	2,115,331
Total assets	$11,080,168	$10,839,652
Liabilities, reserves and surplus:		
Funded debt unmatured	$3,295,000	$3,493,000
Current liabilities	574,951	407,739
Reserves (total unadjusted credits)	4,018,724	3,825,464
Contributed surplus	356,552	356,552
Net surplus	3,191,492	3,113,449
Total liabilities	$11,080,168	$10,839,652

Statement of Bus Line Operations Municipal Railway of San Francisco Year Ended June 30, 1927

Revenues:	Total
Passenger revenue	$74,408
Miscellaneous revenue	23,361
Total revenues	$97,769
Expenses of operation:	
Repairs and painting	$21,046
Tires, including repairs	12,393
Gasoline and oils	18,384
Cleaning, washing and servicing	13,650
Conductors and chauffeurs—Salaries and wages	51,117
Depreciation of buses	15,786
General and miscellaneous	27,234
Total expenses	$159,614
Loss from operations	$61,844
Add: Interest on investment	4,020
Net loss for period	$65,865

Analysis of Items in Fund Held by City Treasurer

Funds	Total	Cash	Securities
Accident reserve	$125,094.39	$29,491.17	$95,603.22
Depreciation reserve	295,939.21	100,150.08	195,789.13
Depreciation	959,421.49	261,818.16	697,603.33
Compensation insurance	2,800.24	2,800.24	.....
Total	$1,383,255.33	$394,259.65	$988,995.68

Analysis of Annual Provision for Depreciation and Percentages Based on Cost

Fiscal Year Ended June 30	Provision For Redemption of Bonded Debt			Cost of Road and Equipment	
	Gross		For Depreciation	Amount	Percentage
1913	$24,291	.....	$24,291	$1,660,492	1.463
1914	149,672	.....	149,672	4,307,115	3.475
1915	294,959	$101,000	193,959	5,042,331	3.847
1916	352,075	101,000	251,075	5,396,706	4.652
1917	264,727	101,000	163,727	5,838,791	2.804
1918	425,271	200,000	225,271	6,174,607	3.648
1919	430,543	196,000	234,543	6,578,885	3.565
1920	486,551	196,000	290,551	6,658,817	4.363
1921	516,414	197,000	319,414	6,674,682	4.785
1922	519,266	197,000	322,266	6,802,637	4.737
1923	538,889	200,000	338,889	7,267,837	4.663
1924	571,172	201,000	370,172	7,570,225	4.890
1925	588,308	201,000	387,308	7,992,410	4.846
1926	549,955	151,166	398,789	8,245,407	4.836
1927	247,362	.....	247,362	8,245,407	3.000
	$5,959,463	$2,042,166	$3,917,296		

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The charges to the reserve account for property retired, in the sum of $43,649 were computed on the basis of percentages appearing in the foregoing table, irrespective as to classes of assets. This was occasioned by the fact that a property ledger is not maintained but it is explained that if this record is installed, it should furnish a more equitable distribution of charges on account of property retired.

Disposition of Amount Ordinarily Set Up for Taxes

The surplus provision for comparable taxation charges stands at $3,148,672. Chapter 3 of Section 16 of Article XII of the Charter of the city and county of San Francisco provides that the books of account of the municipal railway shall show, in addition to other transactions, estimates of the amount of taxes that would be chargeable against the railway if it were owned by a private corporation. In accordance with the foregoing provision, there has been charged against earnings for the period from Dec. 28, 1912, to June 30, 1927, the following amounts, corresponding to the items that would have been paid if the railway were under private control:

State of California franchise taxes	$1,870,453
Federal income taxes	37,696
City and county of San Francisco franchise taxes	1,201,721
City and county of San Francisco car licenses	38,801
Total	$3,148,672

Since no liability exists for the comparison charges which are shown in the table above the amount has been considered as a portion of the general surplus of the railway.

The results of operations for the period from Dec. 28, 1912, to June 30, 1927, are disclosed on exhibit B, a summary of which is given in the following table:

Net profit from operations after deduction of all charges except those for taxes provided by the Charter of the city and county of San Francisco, which are for comparative purposes only	$2,834,939
Deduct: Charter comparative taxation charges	3,148,672
Deficit after deduction of charter comparative charges	$313,733

The net increase in this account, during the fiscal year under review, in the sum of $240,228, is accounted for as follows:

Net profit from operations for the current fiscal year after deduction of all charges except charter comparative taxation charges	$78,042	
Deduct: Charter comparative taxation charges	318,271	
Net increase		$240,228

A reconciliation of the deficit account at June 30, 1926, as between exhibit C of the audit report rendered as of that date and the balance appearing on exhibit A of this report for the same date shown in the accompanying table just as presented in the report.

The net surplus amounts to $3,191,492 and the increase in this account during the fiscal year, in the sum of $78,043, represents the net profit for the year after the deduction of all charges except those provided for by the Charter for comparative purposes.

A reconciliation of this account at June 30, 1926, as shown by Exhibit A of the audit report rendered as of that date with the amount shown in Exhibit A of this report for the same date is as follows:

Surplus, June 30, 1926, Exhibit A prior year's audit report		$5,449,649
Surplus, June 30, 1926, Exhibit A this report		3,113,449
Difference (decrease)		$2,336,199
Represented by:		
Portion of reserve for accrued depreciation of road and equipment credited to surplus reducing reserve to an amount corresponding to assets in depreciation funds	$2,273,732	
Reserve for fire insurance credited to surplus	61,920	
Adjustment of demands payable	672	
Total	$2,336,325	
Less excessive accruals of bond interest payable	125	
Net difference		$2,336,199

The certified public accountants who rendered the report say that the records examined by them indicate a satisfactory condition of accounting procedure, personnel and efficiency — a condition that compares very favorably with that found in organizations of privately owned public utilities and other city and county governments heretofore examined by them.

During the progress of their audit, the accountants who were engaged to make the audit installed, as of July 1, 1927, a modern double entry system of accounts to record all transactions of the municipal railway. In addition they established an accounting procedure which should disclose information necessary for the compilation of monthly reports, as prescribed by Ordinance No. 7060 N.S. of the Board of Supervisors under date of April 19, 1926.

Reconciliation of the Deficit Account

Net loss, June 30, 1926, Exhibit C prior year's audit report		$1,645,378
Add items on books not reflected in audit report:		
Reconstruction charges fiscal years 1922–1925	$28,826	
Replacing cables fiscal year 1924–1925	7,351	
Unaccounted for audit report deduction fiscal year 1924–1925	820	36,997
Total		$1,682,376
Deduct items on books not reflected in audit report:		
Compensation insurance refunds fiscal years 1921–1925		136,832
Deficit per books, June 30, 1926		$1,545,544
Add:		
Adjustment of prior year's demands payable	$672	
Payments made on account of injuries and damages and charged on the books to the reserve for depreciation of road and equipment	571,963	572,635
Total		$2,118,179
Deduct:		
Excess accruals of prior years' bond interest charges	$125	
Compensation insurance refunds, etc., prior years	2,383	
Provision for redemption of of funded debt applicable to bonds heretofore matured and redeemed, charged to expense and credited to reserve for depreciation of road and equipment	2,042,166	2,044,675
Adjusted deficit account, June 30, 1926		$73,504
Charges, current fiscal year:		
Net loss for current year after deduction of comparative charges, exhibit C	$236,684	
Uncollectible accounts receivable written off	25,033	
Expense of prior years	244	
Total charges	$261,962	
Credits, current fiscal year:		
Cancellation of prior year's liability	$11.84	
Excess in compensation insurance reserve, abolished June 30, 1927	21,722.46	
Total credits	21,734	
Net increase in deficit account for year		240,228
Deficit from operations, June 30, 1927		$313,733

Explanation of How the Difference Between the Provision for the Redemption of Bonded Debt and the Cash Transferred to the Bond Redemption Fund Is Accounted For

Provision per Table	$2,042,166
Cash Transferred	1,887,000
Difference	$ 155,166

Represented by Bond Redemption Payments made from Operative Fund on following Bond Issues:

Issue	Date Due	Amount
Geary Street Railway	July 1, 1915	$95,000
Market Street Railway	July 1, 1915	6,000
*Municipal Railway	Dec. 1, 1926	54,166
Total		$155,166

* Represents provision for five months from Dec. 1, 1925, to April 30, 1926, the date on which ordinance 3109 N.S. was repealed

New Directors in Springfield

Three new directors were elected recently to the board of the Springfield Street Railway, Springfield, Mass. They are Frederic M. Jones, president of the Third National Bank & Trust Company; Joshua L. Brooks, president of the Brooks Bank Note Company, and Congressman Henry L. Bowles. The additional directors were elected to increase the local representation on the board. This move increases the number from nine to twelve, eight of whom are Springfield residents.

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Legal Notes

FEDERAL SUPREME COURT—*Action of City in Prohibiting Operation of Bus Line on Certain Streets Considered.*

The city of Hammond, Ind., passed an ordinance forbidding bus companies from operating over certain routes but permitting certain exceptions. This decision was considered at length in the issue of this paper for Dec. 17, 1927, p. 1129. [The City of Hammond vs. Schappi Bus Line, 48 S.Ct., 67, also a similar case, City of Hammond vs. Farina Bus Line and T. Co., 48 S.Ct. 70.]

FEDERAL SUPREME COURT—*Definition of Common Carrier Given. Such a Carrier Can Be Prevented From Reducing Rates.*

The Department of Public Works of the State of Washington established rates for towing, applying to all common carriers, but one tug boat company charged for its services on a different scale, which was said to be "the same or a little less" than the scheduled rate. It claimed it could establish any rates it wished because it was not a common carrier and that it could not be converted into a common carrier by legislative command. The Supreme Court held, however, that "within settled principles, one who undertakes for hire to transport from place to place the property of others who may choose to employ him is a common carrier," and "a common carrier is such by virtue of his occupation, not by virtue of the responsibilities under which he rests." If the company had not been a common carrier, it could make an arrangement with customers for compensation for its services without regard to the rate established by the Department. [State of Washington ex. rel. Stimson L. Co., vs. Kuykendall et al, 48 S. Ct., 41.]

IOWA—*Injury From Sudden Stop of Car to Avoid Accident.*

A passenger after paying fare and proceeding to a seat was thrown down and injured by a sudden stop of the car. The stop was to avoid a collision with an automobile which negligently got in the way, so that the motorman could not have foreseen the need for the sudden stop. The company was held not responsible, as a matter of law, for the injury to the falling passenger. [Wheeler vs. Des Moines C.R. Co., 215 N.W., 950.]

KENTUCKY—*Car Discharges Passengers at Unusual Place Because of Defect.*

A street railway company was justified in stopping a car at a point beyond the usual stopping place when the motor broke down and asking the passengers to alight, since it is lawful to stop a car at any place where necessity and convenience may require. One of the passengers after alighting was struck by an automobile about the time she reached the street. The company was not held responsible since it had no control over the driver of the automobile. [Louisville R. Co. vs. Saxton, 298 S.W., 1105.]

NEW HAMPSHIRE—*Responsibility of Railway Company for Accident to Ferris Wheel in Park.*

A person was injured by the collapse of a Ferris wheel upon which he was riding. The wheel was owned by a concessionaire and was in a street railway park on space leased from a traction company, which owned all of the stock of the street railway operating to the park. The railway had advertised the attractions of the park, including the wheel, on a number of occasions. The court held that while, in most cases, a landlord is not liable to the guests of his tenant for the tenant's negligent maintenance of his leased premises, the situation here was somewhat different because the railway had invited people to patronize the park. This obligated it to use reasonable care to see that the park, including the concessions, was safe for those who had accepted its invitation. The degree of care which it should have exercised was that which was exercised by an average man, rather than that which would have been exercised by a "cautious and prudent man." Hence, an instruction in the trial court that the latter kind of care should have been exercised was held error. [Frear vs. Manchester T. L. & P. Co., 139 A., 86.]

NEW YORK—*Right of Legislature to Regulate Fares.*

Franchises granted by municipal authorities prior to January 1, 1875, when a constitutional article relating to the regulation of fares became effective, are subject to legislative control as to fares, and this control may be exercised through the Public Service Commission. A street railway company was formed by the consolidation of eight companies, seven of which received their franchises prior to the date mentioned. The eighth railroad did not, but as the city consented in 1892 to the electrification of the consolidated lines under a new contract in which no mention of a five cent fare was made, and as other consents were granted by the city to the consolidated company, the inclusion of this eighth line in the consolidation did not pass the control of fares from the legislature (Public Service Commission) to the city authorities. [Evens et al. vs. P. S. Commission et al., 158 N.E., 310.]

OHIO—*Court for Cause Will Reverse Commission's Decision Regarding Cancellation of Transportation Certificate.*

A transportation company charged before the Public Utility Commission that a certain bus operator had violated the orders of the Commission in a number of different ways, such as by operating a larger bus than authorized, failing to pay full license fees, having a defective insurance policy, abandoning part of his route without full authority and conducting some express business without being authorized to do so. A hearing was held by the Commission on the petition to revoke the certificate, but it decided that while there were some irregularities in the operation of the line, they were not so glaring as to warrant the revocation of the defendant's certificate of public convenience and necessity. This decision was appealed to the Supreme Court of the State by the transportation company which brought the original charge. After evidence, the court held the violations constituted good grounds for a revocation of the certificate and the order of the Public Utilities Commission was reversed. [Miami Valley T. Corp., vs. P.U. Commission of Ohio, 158 N.E., 591.]

PENNSYLVANIA—*Cars Must Control Speed at Crossings. Responsibility of Automobile Guest.*

"While trolley cars are not held to the strict rule of control that attaches to a moving automobile at public crossings, they must exercise a certain control to the extent of slackening their speed so as to aid others under stricter control to avoid accidents." An automobile "guest will be held responsible for his action or failure to act in the face of a danger of which he knew, or where it can reasonably be inferred that he must have realized the peril." "Where a guest undertakes to aid in driving a car by observing the condition of the way ahead and surrounding circumstances, he must be held responsible for the result of his own acts." "The guest is responsible for inaction only when he knows of a danger, or where the evidence is such that, from the nature of the situation itself, it appears that he must have realized his peril. He is not required constantly to look out for danger." [Kilpatrick vs. Philadelphia R. T. Co., 138 At., 834.]

TEXAS—*Alleged Negligence of Employee No Defense in Suit Involving Negligence of Employer.*

Under the provisions of article 8306, revised statute of 1925, neither contributory negligence nor negligence of a fellow employee constitutes a defense in the case of damages where specific acts of negligence of employer are proved. [El Paso E. Co. vs. Sawyer, 298 S.W., 267.]

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Personal Items

R. A. Leussler Resigns at Omaha

Leaves acting service after 25 years, but remains in advisory capacity. More time to Omaha Steel Works

R. A. LEUSSLER, vice-president and general manager of the Omaha & Council Bluffs Street Railway, Omaha, Neb., has retired from active connection with the company other than as a stockholder and director after 25 years' service. He will remain in an advisory capacity for some time. He is interested in the Omaha Steel Works and will devote much of his time to that business. Mr. Leussler issued the following statement:

Managing a railway is always a strenuous job and during the past decade it has been particularly so. For some years I have wanted to retire from the railway industry entirely but felt it my duty to remain at my post until some pressing problems confronting the company could be solved. With J. N. Shannahan as president, the affairs of the company are now in able hands and I feel the time has arrived when I can, with justice to all interested, retire.

R. A. Leussler

I, therefore, tendered my resignation to take effect at as early a date as convenient and today it was accepted. At Mr. Shannahan's request, however, I have consented to continue in an advisory capacity for some time.

The 25 years of my service with the company have been full of toil and trials and problems, but they have been pleasant years, too. It has been a privilege to work in close contact with Gurdon W. Wattles and a joy to work shoulder to shoulder with W. A. Smith, whose aims have always been the same as my own, namely, to build solidly and well and to give the people the best car service possible. It has been pleasant, too, to have had always the stanch support of the board of directors.

Now, as to my future plans. I am vice-president of Omaha Steel Works and have a substantial interest in that company. While I do not wish to tie myself down again with active duties it will now be possible for me to give a little more attention to that interest than was possible before and to have some time for leisure. Also as a stockholder and director of the railway I will continue to feel a deep interest in the welfare of that company.

President Shannahan said:

I regret Mr. Leussler's decision to retire at this time, but I can quite appreciate the reasons that impel him to this action. He lightens the blow by his generous willingness to act in an advisory capacity for some time to come. His years of service with this company have given him an understanding of its problems that make his advice of the greatest value to me and I am deeply appreciative of the generosity of his offer to help me.

Mr. Leussler acquitted himself well in Omaha under most adverse circumstances. Under adverse conditions the system there has been affording, on the whole, an adequate and satisfactory service to its patrons. As one of the local papers put it, Omaha people who are familiar with railway service in other cities are aware that their own city has little to apologize for, and much upon which to congratulate itself, in this respect. The difficulties are rather with respect to the company's financial condition, due to an expiring franchise and to maturing bonded obligations that can be met only by extensions or refunding. As the Omaha *Bee* expressed it:

Mr. Leussler came to Omaha at a time when the local company was expanding. It was taking over the lines in Council Bluffs and becoming, in effect, an interstate carrier. Also, it was planning certain interurban extensions. He was then secretary of the company, more particularly concerned with its accounts than its operation. Changed conditions eventually thrust him into the active and responsible management of the concern, where he found himself confronted with problems that might perplex anyone.

To keep his line in first-class condition, with patronage sadly diminished, and to meet its financial obligations was the big job this man had to wrestle with. Whatever else Mr. Leussler has done, he has kept the service at a high standard. Mr. Leussler may retire from a difficult situation, conscious of having done his work well. It is good to know that he has other interests in Omaha that will keep him here as a member of the community.

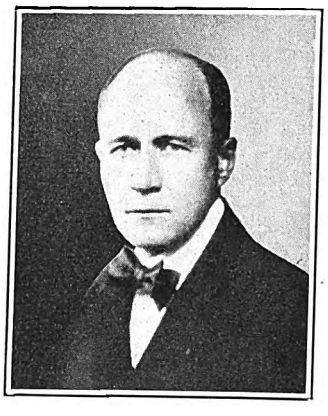
Mr. Leussler joined the company at the time of the consolidation of the Omaha Street Railway, the Metropolitan Cable Railway and the Omaha & Council Bluffs Street Railway & Bridge Company. He served as secretary of the company for five years. Then for five years he acted as assistant general manager. In October, 1919, he was made manager to succeed W. A. Smith.

He entered the electric railway business in 1897 as an employee of the People's Railway, St. Louis, Mo. He left that company to become connected with the St. Louis Transit Company, the operating company of the United Railways, St. Louis. He resigned from the company in St. Louis in 1902 to join the Omaha & Council Bluffs Street Railway.

"Narrow-Gage" Line in Hands of George W. Wells

To George W. Wells will fall the romantic if arduous rôle of handling an important "narrow-gage" railroad soon to be electrified. As vice-president and manager of the Boston, Revere Beach & Lynn Railroad he will have a busy program planning de luxe equipment for the suburbanites, remodeling stations and effecting numerous other improvements included in the prospectus of Hemphill & Wells, an engineering and management organization of New York City, which recently purchased the Massachusetts property.

George Wells has been affiliated with his brother, Gardner Wells, and Albert W. Hemphill in the operation of the Interstate Street Railway, Attleboro, Mass., of which he was local manager until his firm took over the Poughkeepsie & Wappingers Falls Railway property about a year ago. The past year, however, he has divided his time between these two utilities. During the war George Wells was connected with the Transportation Department of the United States Housing Corporation in charge of the work in the East. After the war he spent about two years with the American Electric Railway Association as director of exhibits.



G. W. Wells

His experience and training should fit this railway promoter to fulfill the hopes of the folk of that district who for more than half a century have enjoyed the convenience and advantage of the "narrow-gage," which grew from humble beginnings to a utility owning 26 locomotives and four big modern ferry boats. He received his early training in the General Electric Company, serving first in the construction end and later in the commercial department. For a number of years he was associated with the West Penn Railways at Connellsville, Pa., and spent about five years with Stone & Webster as manager of the Tampa Electric Company.

The combination of Gardner F. Wells as president and George W. Wells as vice-president and general manager portends fast and attractive service and a continuation of the dividend-paying habit, never broken on this utility.

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George Frey Now Brill General Sales Manager

George Frey, who has been assistant general sales manager of the J. G. Brill Company for the past two years, was promoted to general sales manager on Jan. 1. He will continue to supervise the Brill sales organization, which he has done since his appointment as assistant general sales manager, announced in the ELECTRIC RAILWAY JOURNAL, issue of Nov. 7, 1925.

Mr. Frey's affiliation with the Brill organization dates back to July 28, 1914, when he started in the estimating and labor departments. Ten years prior to that he had entered the electric railway field, when, at the age of fifteen years, he got a job in the armature repair shop of the Cincinnati Traction Company. This was the beginning of an experience and training in both the operating and manufacturing ends of the business which has resulted in a broader knowledge of the industry's problems and a better understanding of their solution. His experience includes practical shop work, details of development and design, estimating, service as an executive assistant and selling.

After successively serving in various capacities with marked distinction Mr. Frey was placed in charge of the Brill Southern sales division in October, 1919. Due to his wide practical engineering experience, combined with a forceful and pleasing personality, he was particularly successful in this capacity and obtained results which were responsible for his promotion to the leadership of the Brill sales organization.

John J. Esch Gets Recess Appointment

As a result of the Senate's failure to act upon his renomination, John J. Esch of Wisconsin, chairman of the Interstate Commerce Commission during 1927, automatically went out of office on Dec. 31, but on Jan. 3 President Coolidge reappointed him to act during the recess of Congress over the holidays and until that body can pass upon him.

Mr. Esch, who as a member of the House of Representatives was co-author of the transportation act, was reappointed recently by President Coolidge on the expiration of his first term as a commissioner. The Senate Interstate Commerce Committee, on motion of Senator Wheeler, Democrat, of Montana, postponed a vote on the confirmation, however, and Congress recessed for the holidays.

The chairmanship of the commission under its rules passes to another member with the new year, and Commissioner J. B. Campbell of Washington has been designated for the post by his associates.

The commission is threatened with another vacancy in its membership. Henry Hall of Colorado for some weeks has had in President Coolidge's hands a resignation intended to take effect whenever the President was ready to name a successor.

Among those mentioned for the place are Victor E. Wilson, former member of the Nebraska State Railroad Commission; Claude Porter of Des Moines, a former member of Congress, and P. J. Farrell, now solicitor of the commission.

C. E. Myers and G. T. Atkinson in Philadelphia

Aids were recently announced by Mayor Mackey of Philadelphia, Pa., for the administration of city affairs during the next four years. Clarence E. Myers was chosen director of the Department of City Transit and George T. Atkinson assistant director.

Mr. Myers was connected with the Pennsylvania State Highway Department in various engineering capacities from 1911 to 1921. Prior to 1911 he was affiliated with electric railways in western Pennsylvania. During the war he was a captain and later a major of engineers in America and France. Since 1921 he has been construction engineer and deputy chief of the Bureau of Highways. Early in his career Mr. Myers was an instructor in civil engineering and military science at the Pennsylvania Military College, from which institution he was graduated in 1909 as a civil engineer, and returning for post-graduate work years later received the degree of master of civil engineering in 1926. Mr. Myers was born in McKeesport 40 years ago.

His assistant, George T. Atkinson, is recognized as an authority on transit affairs. In 1888 Mr. Atkinson entered the steam railway service and had eight years' experience in construction and operation with the Louisville & Nashville Railroad. From 1897 to 1909 he was engaged in electric railway construction, operation, management and accounting. Later he became a member of the staff of Ford, Bacon & Davis, consulting engineers, making investigations and reporting on contemplated electric railway systems in various cities throughout the country. His work included the traffic survey and recommended system of rapid transit development published in the report of the Transit Commissioner of Philadelphia under date of July, 1913. He was appointed assistant director of the Department of City Transit in 1915. Mr. Atkinson was born at Carrollton, Ohio, in 1871.

Changes in Minnesota Commission Staff

Frank W. Matson, junior member of the Minnesota Railroad and Warehouse Commission, will succeed Ivan Bowen, retiring member, in the railway, bus and truck division.

C. J. Laurisch of Mankato, the new member, takes up Mr. Matson's former work relating to grade crossings and other activities.

J. C. Guild, Jr., Succeeds the Late B. C. Edgar

Jo Conn Guild, Jr., has been appointed general manager of the Tennessee Electric Power Company, Chattanooga, Tenn., succeeding the late B. C. Edgar. In addition he is vice-president of the company. Mr. Guild is a son of the late Jo Guild, widely known throughout the South in the engineering field and a pioneer in power development in that section.

JAMES C. BENNETT, comptroller and secretary of the Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., has been elected vice-president to have charge of the accounting and treasury departments. The oldest Westinghouse employee began service with that concern in 1886, five months after its formation. His first position was assistant to the auditor, and for some time he was the only assistant the auditor had. Later he was elected auditor. In 1909 the office of comptroller was created for him and a few years later he became secretary. He is a director of the parent company and several subsidiaries.

OBITUARY

Samuel Lewis Shank

The death in 1927 of Samuel Lewis Shank, twice Mayor of Indianapolis, Ind., removes a picturesque and active opponent the state has had to the Indiana Public Service Commission and the regulatory system of public utility control. Always pronounced in his views against state control of utilities, he attracted attention to himself when, as Mayor, he headed a big parade to the State House and demanded the Governor discharge the members of the commission. In a truck heading the parade was a monster signed petition. The Governor paid no attention to the demand. Without the backing of any organization and relying on his own personality, he ran second for Governor among three or four candidates.

G. DANA EMERSON, who died in 1927, was former subway engineer for the city of Boston, Mass. He left Boston about nine years ago. He was engaged by the Boston Transit Commission, the predecessor of the present Boston Transit Board, under Chief Engineer Howard A. Carson, to work on subway plans. He was an associate of Edmund Davis, an assistant to Mr. Carson. The commission was then planning the Boylston Street subway, the Fort Point Channel and Cambridge tunnel subways. He served on the Transit Commission eighteen years and took an important part in the engineering plans in connection with the building of the Washington Street tunnel as well as the Cambridge and Boylston Street tunnels.

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Manufactures and the Markets

$10,000,000 Expansion in Texas Utility Companies

The Texas group of public utility companies under Stone & Webster management, namely, the operating subsidiaries of Eastern Texas Electric Company (Delaware), El Paso Electric Company, Galveston-Houston Electric Company and Northern Texas Electric Company, have arranged for spending approximately $10,000,000 in the next year on improvements and general expansion. A considerable portion of this amount will be used on the railway systems in Fort Worth, El Paso, Galveston and Houston. The Houston transportation system has already invested $340,000 in twenty new cars, and among other expenditures will use about $175,000 to purchase fifteen new buses to establish express bus service from Houston to Harrisburg. It is expected that this service will be started within the next few weeks.

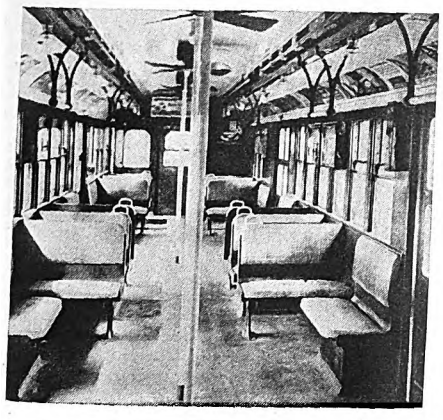
About $3,000,000 of the $10,000,000 appropriation will be spent for construction of power facilities at the Neches station near Beaumont, Tex. Here the Gulf States Utilities Company, a subsidiary of the Eastern Texas Electric Company (Delaware), is constructing an additional unit of 47,000 hp. capacity. The first unit, with a capacity of 40,000 hp., was installed only a little more than a year ago, but the rapid increase in the demand for electricity in the territory served, which is supplied through a network of high-tension transmission lines extending more than 200 miles along the Gulf Coast, so the managements feel, warrants the construction of this second unit, which will more than double the present generating capacity of the Neches power station.

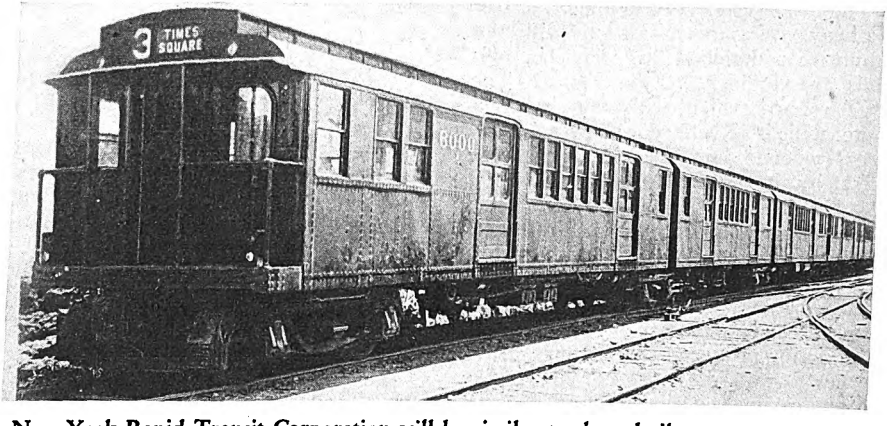
Interborough Not Infringing Car Door Patent

A suit for infringement of patent 1379583, brought by S. P. Walkup against the Interborough Rapid Transit Company, was decided in favor of the defendant in the Circuit Court of Appeals, Second Circuit. The case had been appealed from the District Court of the Seventh District of New York.

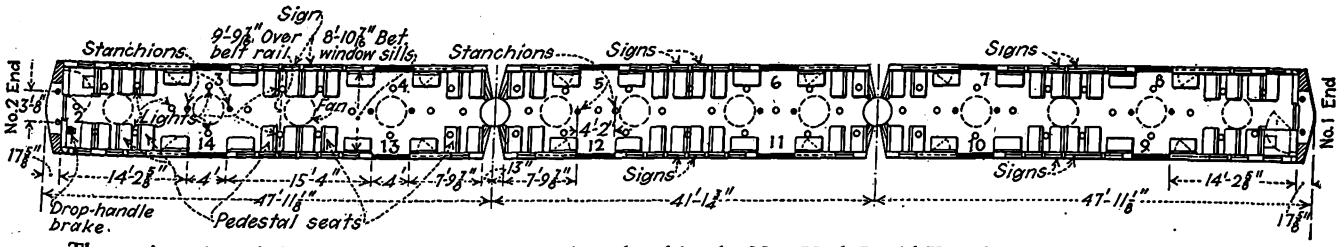
The decision says that the claims in the orginal patent indicate the inventor expected that the door control system would be actuated from contacts made at the station and from power from a

Details of Fifty Triplex Car Units for New York Rapid Transit





The new triplex cars of the New York Rapid Transit Corporation will be similar to those built on a previous order, which are shown in the illustrations. The view at the left was taken in one of the end sections of the unit looking from the connecting drum



The seating plan of the 50 triplex car units recently ordered by the New York Rapid Transit Corporation will be similar to the above plan of one of the 67 previously ordered

Specifications have recently been released for the 50 triplex car units—equal to 150 single cars—which were ordered Nov. 19 from the Pressed Steel Car Company by the New York Rapid Transit Corporation. Mention of the order for these car units being placed by the Brooklyn-Manhattan Transit Corporation, the controlling company, was noted in the JOURNAL for Nov. 26. The cars will have an over-all length of 137 ft., a total weight of 207,190 lb. and a seating capacity for 160 passengers. They are of all-steel construction. Subjoined are the specifications as released:

Number of units	50
Type of unit	Articulated, motor, passenger, city
Number of seats	160
Builder of car body	Pressed Steel Car Co., Pittsburgh, Pa.
Date of order	Nov. 19, 1927
Total weight	207,190 lb.
Length over all	137 ft. 0 in.
Length over body posts	41 ft. 1⅛ in.
Truck wheelbase	47 ft. 11½ in.
Height, rail to trolley base	12 ft. 1 44 in.
Body	All Steel
Air brakes	Westinghouse A.M.U.E. variable load, plain
Armature bearings	General Electric
Axles	5½x9 quenched and tempered carbon steel
Car signal system	Faraday buzzers
Compressors	Westinghouse D-3-F
Conduit	Sheraduct, metal
Control	General Electric type PC 15-B
Couplers	Westinghouse H-2-A
Destination signs	Hunter Illuminated
Door mechanism	Consolidated
Doors	Morton Manufacturing, sliding
Energy-saving device	Power-on time recorder
Finish (paint)	DuPont, Devoe & Reynolds
Floor covering	Flexolith
Gears and pinions	General Electric and Westinghouse
Glass	Pittsburgh Plate Glass Co.
Hand brakes	Blackall ratchet staff and Peacock gear
Hand straps	Enamel hand rail (Ellcon)
Heat insulating material	"Resisto" ¼ in.
Heaters	Inclosed element type
Headlining	Agasote
Interior trim	Steel
Journal bearings	Plain
Journal boxes	McCord
Lamp fixtures	Aero metal
Motors	Four General Electric 282-B, inside hung
Roof type	Monitor
Roof material	Copper bearing steel
Sash fixtures	O. M. Edwards
Seats	Cross and longitudinal
Seating material	Rattan
Slack adjusters	Body, Westinghouse; truck, Smith-Ward
Step treads	Feralun
Trucks	Pressed Steel Car Co.
Ventilators	Shutter type
Wheels, type	Rolled steel, diameter 31 in. and 34½ in

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battery or other source of power outside the train. This idea was held not to include the system used by defendant in which the train circuit is used in the door control system.

Harvey Hubbell, Jr., Heads Company His Father Founded

Harvey Hubbell, Jr., was elected president and treasurer of Harvey Hubbell, Inc., Bridgeport, Conn., at a meeting of the board of directors held Dec. 27, 1927. He succeeds his father, the late Harvey Hubbell, whose death was mentioned in the ELECTRIC RAILWAY JOURNAL, issue of Dec. 24. Harvey Hubbell, Jr., was associated with his father in the management of the business. No changes in the established policies of the company are contemplated.

Rehabilitation Program in Worcester Shows Results

The Worcester Consolidated Street Railway, Worcester, Mass., will not authorize a dividend this year, but officials are confident of the future. The 1927 report, which will soon be complete, will, it is believed, show a loss in gross revenue, but this will probably be offset by the reduced operating costs.

More than $1,250,000 has been spent in Worcester during the year, in the rehabilitation of the road as promised to the city when it consented to permit the New York, New Haven & Hartford Railroad to resume control of the franchise. The major promise was the purchase of 50 new cars. These are now in service. A new carhouse and a garage have been built at the Grove Street plant and are now in use. In addition tracks in many parts of the city have been relocated, others replaced and roadbeds have been improved.

It is said that the substitution of bus service for trolleys in many places in Worcester County by the Consolidated has reduced operating costs. Railway service to Fitchburg, Southbridge, Springfield, Webster, the Blackstone Valley, Marlboro, Clinton and Leominster has been discontinued and replaced with bus service. In the city of Worcester bus lines have been instituted on the Edgemere and Tatnuck-Dawson road routes and the company is committing itself to an extensive bus system.

The accomplishment in roadbed improvement and similar work has been most impressive. Howard R. Whitney, president of the company, said:

> While the return on our investment in Worcester is not at present seen, there is every indication that we will realize on it in 1928. It should be remembered that we spent this large sum of money this year and it would be impossible to produce definite evidence of a return. However, our most recent reports indicate that our railway passenger business is increasing, due to some extent to our new rolling stock.

The new plan of bus service is proving satisfactory. The bus business, of course, during the summer months was bad because so many people used their private automobiles. During the winter bus service increases steadily. I believe that we will show a profit for our bus for the year despite our expenditures for a new garage and new equipment.

There are 230 closed cars on the 114 miles of track operated by the company in Worcester in addition to 50 open cars. To supplement the railway service there are 52 motor coaches.

Will Award $100 for Best Leather Slogan

The executive committee of American Leather Producers, Inc., has authorized an award of $100 to the individual, irrespective of his business affiliations, who will submit, prior to Jan. 15, 1928, a slogan that in the opinion of the committee is of sufficient merit to be used by the leather industry as a whole. Desirable qualities in the slogan wanted are forcefulness, brevity and simplicity. It must also be comprehensive, to include all types of leather.

Prices Stiffen on Copper; Lead and Zinc Steady

Markets for the non-ferrous metals have been very quiet during the week ended Jan. 4. Copper, however, has shown quotational strength and is virtually established at 14.125 cents delivered. Lead is unchanged in New York and slightly firmer in St. Louis, whereas zinc is, if anything, a shade weaker. Tin prices are off a fraction of a cent in the domestic market.

During the week copper has sold at prices ranging from 14 cents to 14.125 cents, Connecticut Valley basis, though but one small sale at 14 cents has been made since Dec. 31. Since then the bulk of the metal has brought 14.125 cents. A big tonnage brought 14.25 cents for delivery in the Middle West Jan. 4. Copper Exporters, Inc., have maintained their price at 14.50 cents c.i.f. The f.a.s. market has been good at 14.25 cents.

The New York price for lead continues unchanged at 6½ cents, the contract price of the American Smelting & Refining Company. In the Middle West there is a slight disposition to quote higher prices than 6.30 cents, St. Louis.

Zinc prices have ranged from 5.625 cents to 5.675 cents, the higher figure covering metal for forward delivery.

Forward tin has ruled about one-eighth cent less than prompt. Prices on the 99 per cent grade have recently been only nominal.

METAL, COAL AND MATERIAL PRICES
F. O. B. REFINERY

Metals—New York	Jan. 3, 1928
Copper, electrolytic, cents per lb.	13.862
Copper wire, cents per lb.	15.75–16.00
Lead, cents per lb.	6.50
Zinc, cents per lb.	5.987
Tin, Straits, cents per lb.	57.75
Bituminous Coal, f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	.....
Somerset mine run, Boston, net tons	.....
Pittsburgh mine run, Pittsburgh, net tons	.....
Franklin, Ill., screenings, Chicago, net tons	1.55
Central, Ill., screenings, Chicago, net tons.	1.50
Kansas screenings. Kansas City, net tons.	2.175
Materials	
Rubber-covered wire, N. Y., No. 14, per 1,000 ft.	5.50
Weatherproof wire base, N.Y., cents per lb.	16.50
Cement, Chicago net prices, without bags	2.05
Linseed oil (5-bbl. lots), N. Y., cents per lb.	10.6
White lead in oil (100-lb. keg), N. Y., cents per lb.	13.25
Turpentine (bbl. lots), N. Y., per gal.	0.65

SHOPS AND BUILDINGS

PHILADELPHIA RAPID TRANSIT COMPANY, it is reported, will shortly build in the neighborhood of Front Street and Green Lane, a new shop and maintenance building at an approximate cost of $2,000,000.

TRADE NOTES

OHIO BRASS COMPANY, Mansfield, Ohio, announces the opening of an office at 721 Healy Building, Atlanta, Ga. H. W. Kilkenny, representative of the company for the past four years with sales headquarters in the Pittsburgh district, has transferred his activities for his company to the St. Louis district. S. W. Walworth succeeds him in the Pittsburgh territory.

WHITE MOTOR COMPANY, through its president, Walter C. White, has announced the promotion of George W. Smith, Jr., formerly technical assistant to the vice-president and general manager of the company, to the position of works manager. Mr. Smith succeeds R. M. Hidey, resigned.

R. C. JENKINS has joined the forces of the Shuler Axle Company at Louisville, Ky., in the capacity of special representative.

ROLLWAY BEARING COMPANY, INC., Syracuse, N. Y., recently announced that it had opened a sales office at 614 Empire Building, Pittsburgh, Pa. Samuel Farrell, who has been affiliated with the Rollway Bearing Company, Inc., for a number of years, with headquarters at Youngstown, Ohio, is in charge of the above office.

ADVERTISING LITERATURE

CROUSE-HINDS COMPANY, Syracuse, N. Y., has issued a folder containing suggestions for floodlighting. Seventeen illustrations increase attractiveness of the folder.

OHIO BRASS COMPANY, Mansfield, Ohio, has issued a folder describing its OB splicers. Various types of splicers are shown in the illustrations. The number of the folder is 150-B.

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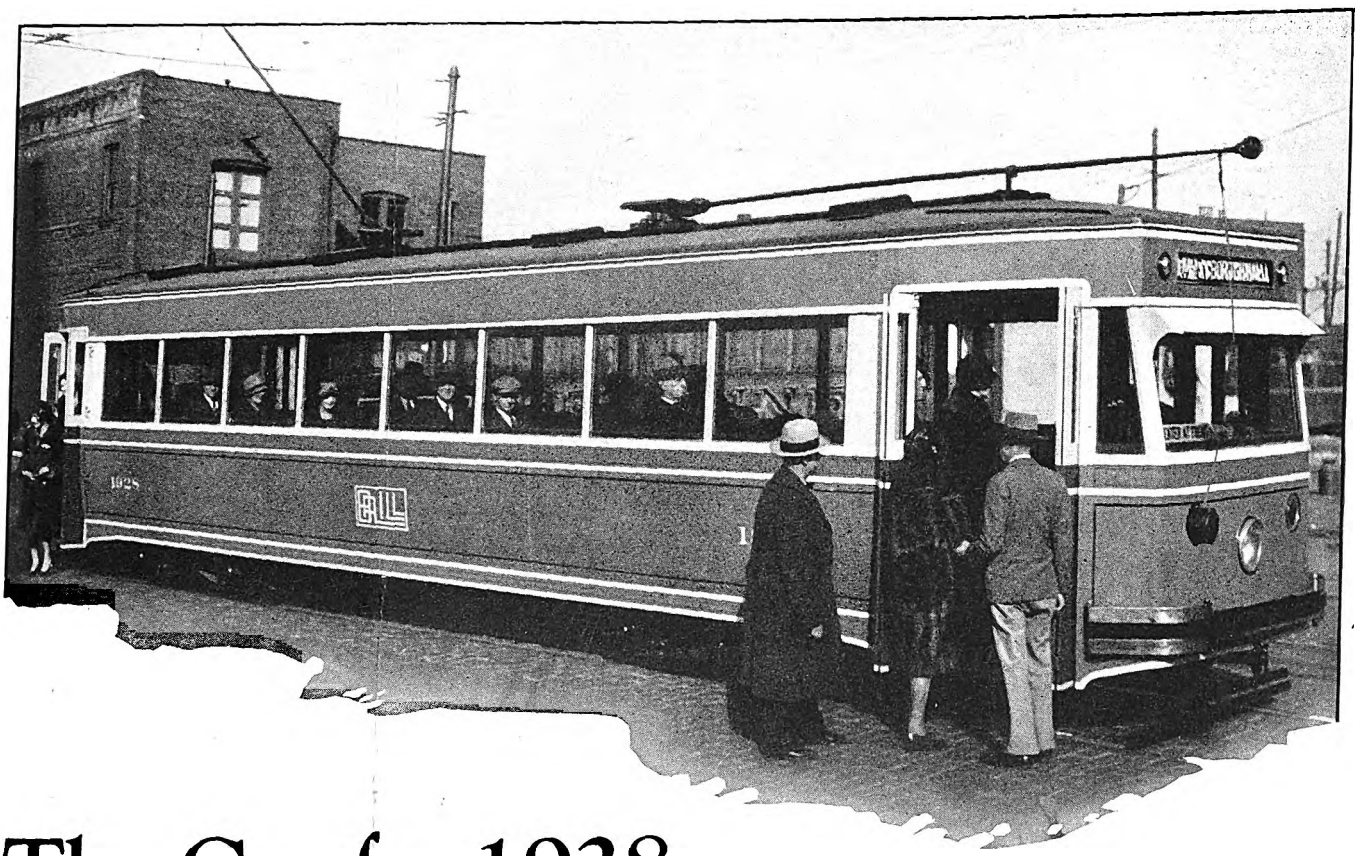


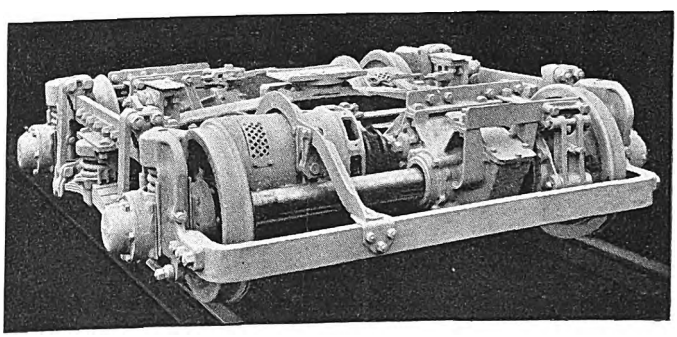
The Car *for* 1928

Will get more than "necessity riders"

A new year with all its hopes and opportunities has dawned. To some railways, already using cars which appeal to the riders, it means increased riding; to others it means an opportunity to place in service new modern cars which will enable them to provide a service which will attract others than those who ride of necessity.

How its trucks meet modern demand

The Brill No. 277-EX trucks under "the car for 1928" designed and built by Brill include a number of innovations in keeping with modern demand. With light-weight high-speed motors off the axles, a double-reduction gear unit in oil, and external-contracting clasp type shoe brakes on axle drums, desirable noise reduction is accomplished. At the same time such conventional design features as contribute to its smooth and comfortable riding are retained.



Brill No. 277-EX Truck with W-N Drive and drum brakes meets the modern demand without sacrificing the important features of conventional design established in years of practical operation.

THE J. G. BRILL COMPANY
PHILADELPHIA, PA.
AMERICAN CAR CO. ST. LOUIS MO. — G.C. KUHLMAN CAR CO. CLEVELAND, OHIO. — WASON MANF'G CO SPRINGFIELD, MASS.

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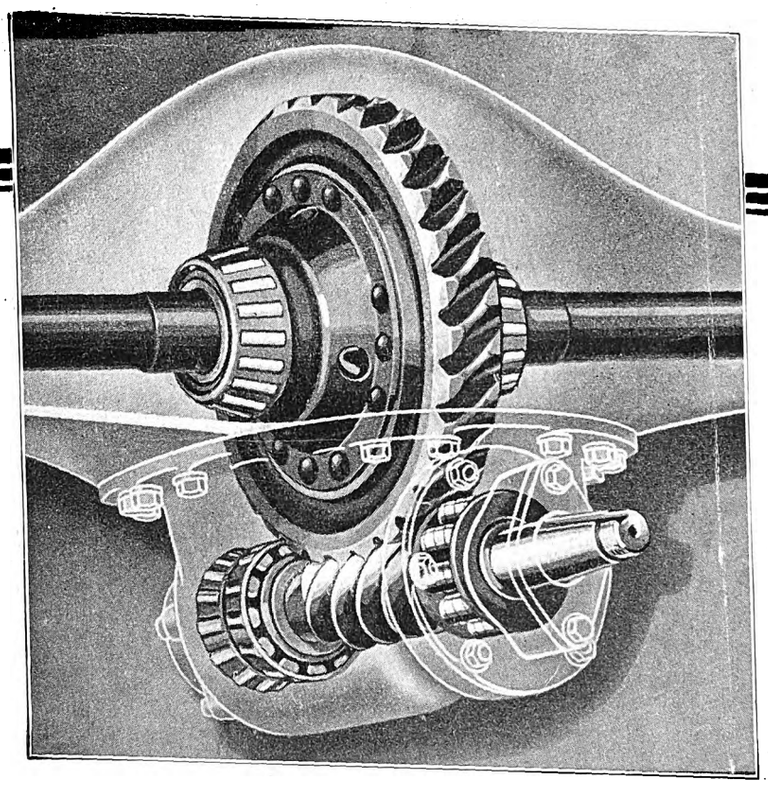

Since 1904—the finest quality

EXPERIENCE and sincerity built into any product mean a good product. They are built into Timken Axles. ¶ Since 1904 experience has brought increasing knowledge and additional proof of the superiority of Timken Axles. ¶ There has not been any increase in Timken's insistence upon the highest quality—there couldn't be.

THE TIMKEN-DETROIT AXLE CO., DETROIT, MICH.

TIMKEN AXLES

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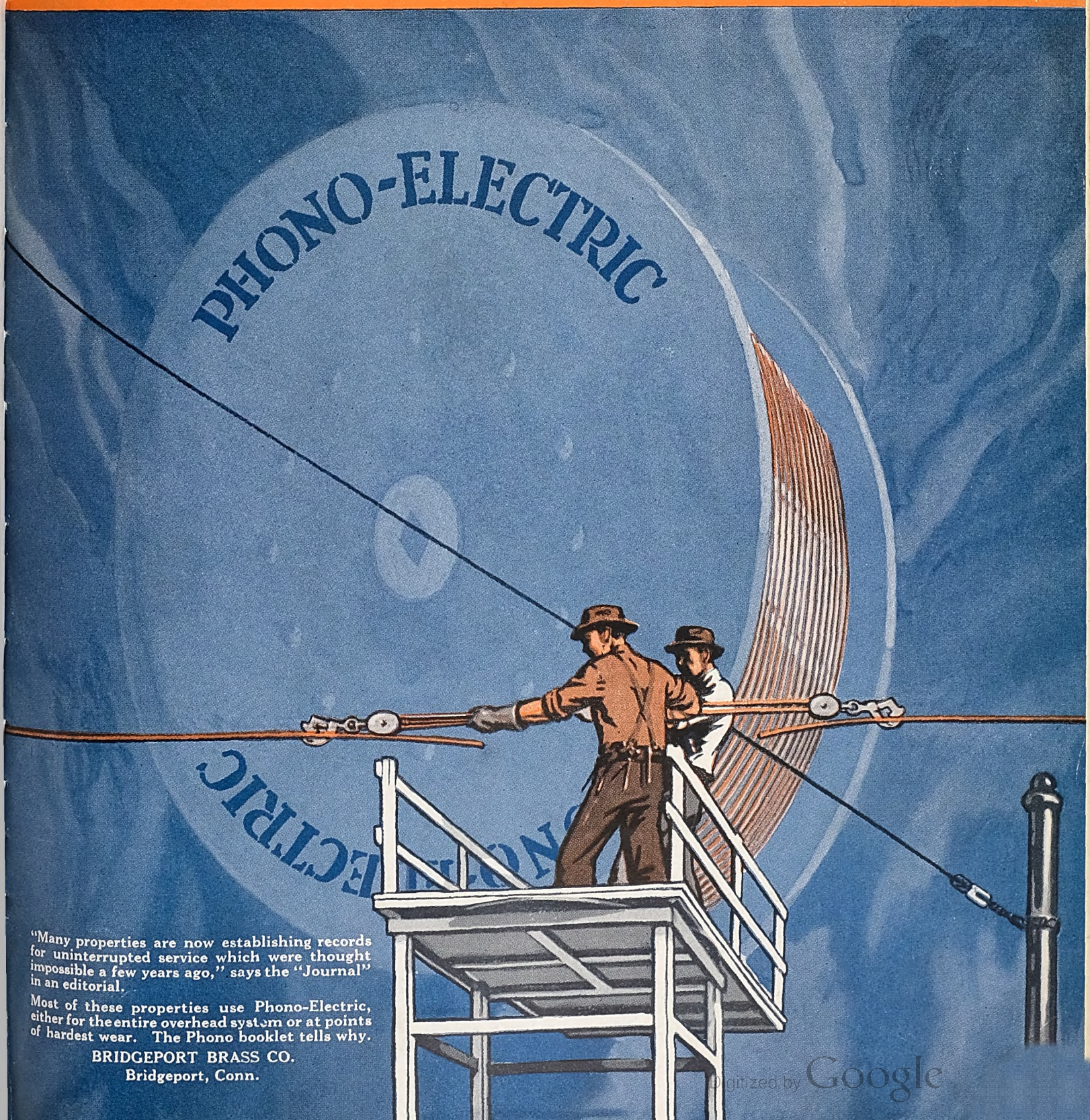
ANNUAL STATISTICAL AND FORECAST ISSUE

ELECTRIC RAILWAY JOURNAL

McGraw-Hill Publishing Company, Inc. JANUARY 14, 1928 Twenty Cents per Copy



"Many properties are now establishing records for uninterrupted service which were thought impossible a few years ago," says the "Journal" in an editorial.

Most of these properties use Phono-Electric, either for the entire overhead system or at points of hardest wear. The Phono booklet tells why.

BRIDGEPORT BRASS CO.
Bridgeport, Conn.

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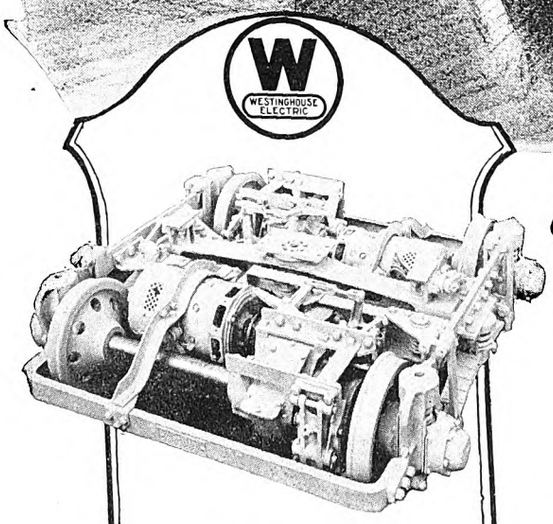

W-N Drive Installation

W-N Drive advantages

- Lowest steps
- Faster acceleration
- Quiet operation
- Motors spring borne
- Gears run in oil
- Greater clearance
- Lighter weight
- Lower maintenance

"Let's all go for a ride —in the new W-N Street Car *it rides better than an Auto"*

THERE was a time not so long ago that people took the street cars just for a ride—that was before the day of cheap autos.

Now the new W-N drive is popularizing car riding again and bringing back business that rightfully belongs to the street railway companies.

The low steps, comfortable riding qualities, quiet operation and fast acceleration of W-N Drive Cars are giving the public a new idea of street car transportation.

The automobile and the motor bus are no longer competition; the W-N Drive gives luxurious transportation—at a fraction of the cost.

Street railway companies can now capitalize on new equipment with W-N Drive because of increased patronage and lower maintenance.

Westinghouse Electric & Manufacturing Company
East Pittsburgh Pennsylvania
Sales Offices in All Principal Cities of the United States and Foreign Countries

MEMBER AMERICAN ELECTRIC RAILWAY ASSOCIATION AERA COM

1928

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Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review
Published by McGraw-Hill Publishing Company, Inc.
CHARLES GORDON, *Editor*

Volume 71 New York, Saturday, January 14, 1928 *Number 2*

Persistent Improvement

Is the Price of Success

ANOTHER year of readjustment has just closed for electric railways. Much progress has been made in meeting changed conditions by revamping and readjusting outworn methods and facilities. But in no instance have all the possibilities for improvement been exhausted. Those managements which have gone forward courageously have made the greatest progress. They see the most work still to be done and express the most optimistic outlook for the future.

Despite the interest taken throughout the country in improving the character of cars operated by electric railways, actual buying of new cars has lagged. Development in design, on the other hand, has attracted widespread attention. At the Cleveland convention it was clearly manifest that the industry became thoroughly aroused during 1927 to the importance of developing cars that can compete successfully with the automobile. The exhibits included many body, truck and equipment ideas that represented long steps forward in a single year. It seems evident, therefore, that the number of new cars built in 1928 will probably depend to a considerable extent on the speed with which the development work is carried to fruition and the degree of success achieved by some of the newer types of design. If these designs are successful in meeting the competition of the automobile, this may be expected not only to release pending orders for new cars, but also to interest many properties which still are inclined to cling to obsolete equipment.

TRACK reconstruction was unusually active during 1927. This was a continuation of the increased activity shown in 1926. Electric railways have come to see that they face the alternative of putting track in first-class operating condition or, if the density of traffic does not justify the expenditure for track reconstruction work, of abandoning it altogether and substituting buses. The mere fact of the widespread investment which is being made in track reconstruction is ample evidence of confidence in the future of rail transportation.

BUS operation by electric railways is expanding steadily, though undergoing some readjustment and experimentation to determine the proper relation between the new vehicle and existing transportation lines. That relation rapidly is becoming clearer, with marked trends toward certain types of vehicles and classes of operations. A sharper line is being drawn between the operation of buses as street cars on rubber tires; that is, as substitutes for cars, as feeders, cross-town connections or extensions, and the use of buses to give service of a class distinctly different from that of the low-priced rail ride. All signs indicate that bus operation by electric railways may be expected to maintain a healthy rate of increase.

As the industry faces a new year, the general question of the moment again is, "What does the future hold in store?" There is less of desperate demand in the question today than at any other time during the past several years. No longer is the issue one of life and death for the industry. Assured of the fundamental need for public transportation, electric railways can contemplate the future with confidence. But though the outlook has improved, to be content merely to drift into the future would be the height of folly. Real progress is achieved only by keeping a sharp lookout. The opportunity exists for winning greater success than ever—but only by persisting in the application of initiative and ingenuity to meet changed conditions.

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Track Reconstruction in 1927 Largest in Many Years

CONFIDENCE in the future of electric railway transportation is indicated by the record-breaking amount of track reconstruction during 1927. Approximately 900 miles of track was rebuilt, of which 700 miles was city track and 200 miles was interurban. This total exceeded the 1926 figure by about 100 miles and topped the previous high record of 1923 by approximately 50 miles. It is about 60 per cent above the average of the past ten years. Activity in city track construction accounts for the increase. The mileage of interurban track rebuilt was substantially the same as in 1926 and well above the average of recent years.

Track extensions made during the year just ended, including steam railroad electrifications, totaled slightly more than 330 miles, or considerably less than those made in 1926. This is a little below the average for recent years. It is noteworthy, however, that electric railway track additions made since Jan. 1, 1917, total more than 4,000 miles. Since more than 3,000 miles of bus routes were added by electric railways during the past twelve months, it seems natural that only a moderate amount of new track is being built.

Ten electric railways ceased operation altogether during 1927. Of this number six were local lines, averaging about 7 miles in length, and four were interurbans, with an average of about 30 miles of track apiece. Bus service was substituted under the same management in two instances and under different management in five instances. No transportation is now being furnished in the territory formerly served by the other three railways. On railways which continued to operate the major portions of their systems buses replaced some 450 miles of car service in 1927. The amount of this replacement was considerably larger than in 1926. Nevertheless, the combined total of partial and entire abandonments in 1927 represented only a little over 1 per cent of the track mileage of the industry. It should be remembered, too, that this was largely offset by the additions to electrified mileage.

Summarizing the gains and losses in the past decade, it is found that the total additions are substantially greater than the total abandonments. Moreover, some 19,000 miles of bus routes have been added during this period, so that the present combined track and bus mileage is far in excess of the pre-war mileage.

Bus Operation Expanding Along Sound Lines

STEADY increase in the bus operations of electric railways occurred during the past year. The rate of growth was approximately the same as in 1926. The number of buses increased about 20 per cent, as did the route mileage. The number of bus-operating railways also showed a substantial increase. Purchases of buses were only a little less than in the preceding year. From this it is evident that a healthy condition exists and that the expansion of electric railway bus operations is steady and sound.

Several significant developments in bus design occurred last year. Foremost among these was the trend toward smaller, lighter and more luxurious vehicles, approaching the private automobile in the character of service rendered. The number of de luxe buses bought was larger than in previous years, and the average seating capacity was somewhat lower. It was notable that companies which had previously started de luxe service at a higher fare purchased more vehicles to extend this service.

On the other hand, new single-deck designs were brought out last year with unusually large seating capacity. Purchases of this type of equipment, while not in large volume, were scattered over a number of properties. That large seating capacity alone is not the only requirement for successful bus operation is indicated by the waning popularity of double-deck buses. The number bought in 1927 was less than for several years past. Judging from this it appears that the general trend is toward the operation of smaller high-grade vehicles suitable for giving a preferred type of service at substantially higher rates of fare.

The extent to which bus service replaced rail service in 1927 was somewhat greater than in 1926. The mileage of such replacements, however, was only one-fifth of the total mileage of bus route extensions. Thus it is again shown that the bus finds its greatest usefulness as an additional and supplemental part of the local transportation systems.

The Need for Ignoring Tradition Is Greater Than Ever Before

EVIDENCE is available on all sides of the progress which the electric railways are making. It is no small accomplishment to have secured fare readjustments that have put much of the nation's mileage on a 10-cent fare basis, to have brought about co-ordination of buses on the present scale, to have secured widespread recognition by a former monopoly business of the need for merchandising and modernizing, to have obtained passage of paving relief measures and to have done the other things of which there is record.

Properties like those of Chicago, Pittsburgh, Atlanta, Richmond and Grand Rapids and some of the revamped interurbans, where it was necessary to resort to physical and financial rehabilitation, are doing well, but the full effect of the heroic changes to which many roads have resorted has only begun to be reaped.

Certainly the situation with respect to receiverships has been materially bettered. The Chicago Railways is the only large city system under the jurisdiction of the court. This is attributable entirely to delay in working out a satisfactory franchise. Although the principal of the bonds is in default, interest is being paid and there is no complaint on the score of earnings of the property. The total amount of bonds in default for the industry still looms large, but there is a strong current of underlying improvement in conditions and the capitalization of property after property is being brought to a sound earning basis. So far as the interurbans are concerned only two large properties of this kind remain under court jurisdiction.

Individual properties have been slow to take advantage of the recommendations of the finance committee of 1925, which suggested voluntary readjustment of finances. But that matter is a live topic again. Voluntary readjustment looking toward the scaling down of fixed charges on existing securities is a process that is not easy of accomplishment, but it offers attractive possibilities to the owners of existing securities for enhancement in the value of their investment through permitting the property to finance needed improvements on reasonable terms. The Grand Rapids Railway was able

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to simplify its financial structure, and the Pittsburgh Railways is still at work on the effort to consolidate the debts of the companies which go to make up that system. At least one other readjustment of large proportions is under way, but the matter is not far enough along to refer to it specifically.

The present is a particularly propitious time for financial housecleaning since money rates are very low. That the railways which borrowed this year did so at rates advantageous to themselves is attested by the record of financing elsewhere in this issue. The operation of the Twin City Rapid Transit Company in arranging a loan of $18,000,000, secured by a lien under which bonds were sold to yield investors 5.70 per cent, is an instance of a strong company which took advantage of a favorable money market to provide for its future cash needs and to anticipate obligations that do not mature for some months. But it is the small and medium sized companies that need particularly to be nurtured. Something may come of discussions which look toward a plan to make new equipment available to them under a car trust.

An industry has won half the battle which has diagnosed its problems as clearly as have the electric railways, but the need for keeping everlastingly at the work in hand is more insistent than ever. The electric railways will achieve their ends only as they are actuated by the determination to meet changed conditions for which there seems to be no parallel in industrial history. It is difficult to break down the barriers of the past, but the need is greater than ever for ignoring tradition.

Budgets for 1928 Show Confidence

CONTINUED faith in the local transportation industry is shown by the budgets prepared by the various companies for the present year as compared with those of a year ago. Large expenditures are planned for capital account in 1928. It is significant that the biggest increase is for way and structures, indicating that those who control the properties are satisfied that rail transportation will continue for a great many years. Country-wide estimates indicate that the electric railway companies will spend $246,142,000 for new plant and equipment and maintenance materials during the year. This is greater than the amount spent in 1926 or 1927 for similar items. Contrasted with last year, it is 9.27 per cent higher.

Capital expenditures for track are estimated at $89,677,000, which is by far the largest amount estimated since this paper has been presenting budget figures for the industry. Compared with the average expenditures for 1924, 1925 and 1926, it is 70 per cent greater. This is the more remarkable since the money spent on track reconstruction in 1927 was almost 50 per cent more than the three-year average. It is an indication that there is little further tendency to defer trackwork because some other mode may render rail transportation obsolete. Proposed expenditures for cars, $35,495,000, are slightly greater than for 1927. This is considerably less than the average of the years 1924-26. Indicated bus purchases are also slightly higher than for 1927, although the size of the market for buses has changed but little for the past four years.

Purchases of maintenance materials planned for this year show an increase in all items. While these are not large, there is every indication that the industry is preparing to take good care of its physical plant. In particular, the larger amounts spent for bus maintenance last year and the estimated expenditures for this year indicate that since equipment of this type is all relatively new, and more and more buses are being added each year, the maximum of bus maintenance costs has not yet been reached.

The careful preparation by the companies of the figures from which these industry estimates were calculated shows increased interest by operators in annual industry budgets published by the JOURNAL. It also shows that electric railways are giving more attention to plans for the future. But it is far more significant that the actual figures for planned expenditures indicate a growing confidence in the stability of the industry and in the continued need for efficient local transportation.

Car Situation Demands Earnest Attention

WHEN analyzed from the standpoint of new rolling stock purchases, the year 1927 was a period of waiting. The value of speed, beauty, style and quiet operation of electric cars for stimulating increased riding was recognized in 1926 and substantial progress was made toward perfecting designs that would have increased rider appeal. Further refinements in car body construction and several radical changes in truck design were brought out at the beginning of 1927. These have undoubtedly had the effect of delaying purchases of needed rolling stock pending further experience with the experimental designs.

This delayed buying of cars cannot long continue. The industry must proceed with the replacement of obsolete equipment to meet the changed conditions of the day and to eliminate the excessive operating cost of old cars. Then there may be expected not only the active business of a normal year but also the increase due to the deficiency in car replacements during the past several years.

The number of passenger cars, 945, bought by electric railways during 1927 was the lowest for any single year in the records of the industry. In 1921, which previously was the low year, there were 1,188 passenger cars purchased. The total of all types of cars and electric locomotives for 1927 was brought above that for 1921 by the increased number of freight and dump cars bought. New city passenger cars in 1927 were 22 per cent less than for 1925 and 34 per cent less than for 1926. Interurban passenger cars bought in 1927 were 62 per cent less than in 1925 and 60 per cent less than in 1926.

Cars of the two-man type predominated in the orders for large cities. There were, however, 410 one-man or one-man, two-man cars reported. This constitutes 45.9 per cent of all the cars ordered for city service. Reduced weight was sought in every way possible. Several experimental cars were built in which aluminum was used largely in the construction, and light weight was a controlling feature in all the new truck designs. Low floor heights with small wheels and four-motor equipments were the rule for new city cars.

It is quite obvious that the entire car situation constitutes a problem of major importance. It is of gravest consequence to the industry and deserves the earnest attention both of operating and manufacturing executives. The primary motive back of all the new designs is to develop cars that will attract increased revenue. Manufacturers are therefore entitled to the fullest possible co-operation from the industry in this effort. Only with such co-operation may they be expected to carry through successfully this expensive development work.

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Railway Operations Show Basic Improvement

Stabilization has followed the economic upset caused by the war, and improvement can be looked for in 1928. Industry statistics cover trends of revenues and expenses, as well as comparisons with other indices of business

VITAL changes that affect the electric railway industry have been under way ever since the beginning of the war. In fact, some of them had their inception before that time, although they had not become of great moment until the entire economic structure of the country was upset. However, at no time since this period of readjustment began have conditions been so thoroughly stabilized as during the past year. The industry has now adapted itself to the changed conditions and it is not to be anticipated that there will be any periods of doubt and uncertainty in the near future such as existed in the era the country has passed through.

Two major factors have exerted a profound influence on the local transportation industry. The first of these is the tremendous increase in costs of every kind, while the second is the advent of the passenger automobile as an active competitor. Other factors that have had a lesser influence are the general prosperity of the country and the trend of industrial employment.

The effects of these influences may be seen by a study of the charts accompanying this article. These were prepared originally by the American Electric Railway Association's statistical department, and were exhibited at the Cleveland convention last October. In co-operation with the association, these have been extended to include the latest available figures, so that the trends may be seen almost to the end of 1927.

Passenger Traffic and Industrial Employment

Trends of passenger traffic and employment for the last three years are shown graphically in Chart I. The earlier portion of the chart is computed for 201 electric railway companies, while for the last five months of 1927 the number of companies varies somewhat, as slightly fewer of them turned in complete reports. The 201 companies operate 26,215 miles of single track and 6,277 miles of bus routes. The track represents 62 per cent of the total electric railway mileage in the country.

Frequently the assumption is made that the passenger traffic of local transportation systems follows the trend of industrial employment. In previous years this may have been true to a considerable extent. As seen in Chart I the peaks and valleys of employment in the earlier months have corresponded rather closely to the riding, although the summer drop in employment is considerably less pronounced than that in traffic.

General business conditions were somewhat less stable in 1927 than they were in 1926. The difference is evidenced in the reduced employment index for the past year, which was lower than for 1926 and also lower than for 1925, which was not so good a year as 1926. It is

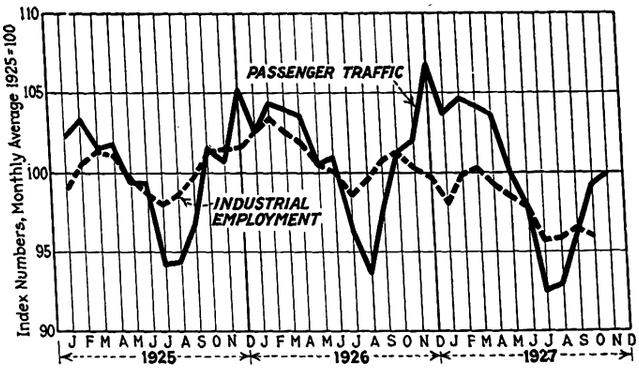

Chart I—Trend of passenger traffic and industrial employment for the years 1925, 1926 and 1927

The trend of passenger traffic was greater for the first quarter of 1927 than in 1926. Beginning in April, the index declined, but in August it again began to rise. The information was obtained by the American Electric Railway Association and the U. S. Bureau of Labor Statistics.

an encouraging sign to note that the riding during November and December, 1926, and in the first months of 1927 actually showed an increase, even though there was a drop in employment. Somewhat later in the year traffic fell off, but as the season advanced traffic has shown indications of coming back to normal, though employment continued to have a downward trend.

Many years ago the electric railways did their maximum business in the summer months. This was to a

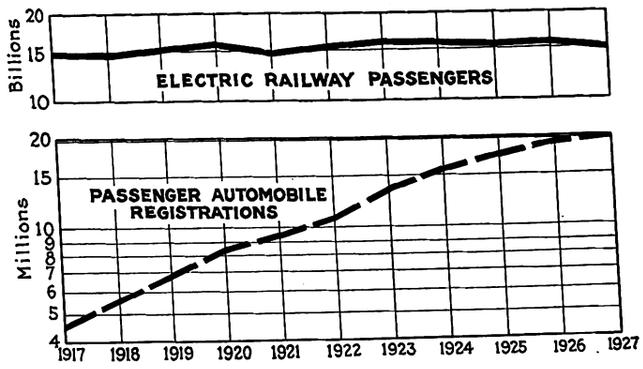

Chart II—Trends of electric railway traffic and passenger automobile registration during the past eleven years

Figures collected by the American Electric Railway Association and the National Automobile Chamber of Commerce show that though automobile registrations have experienced an enormous growth in the past decade they have not materially affected electric railway passenger traffic.

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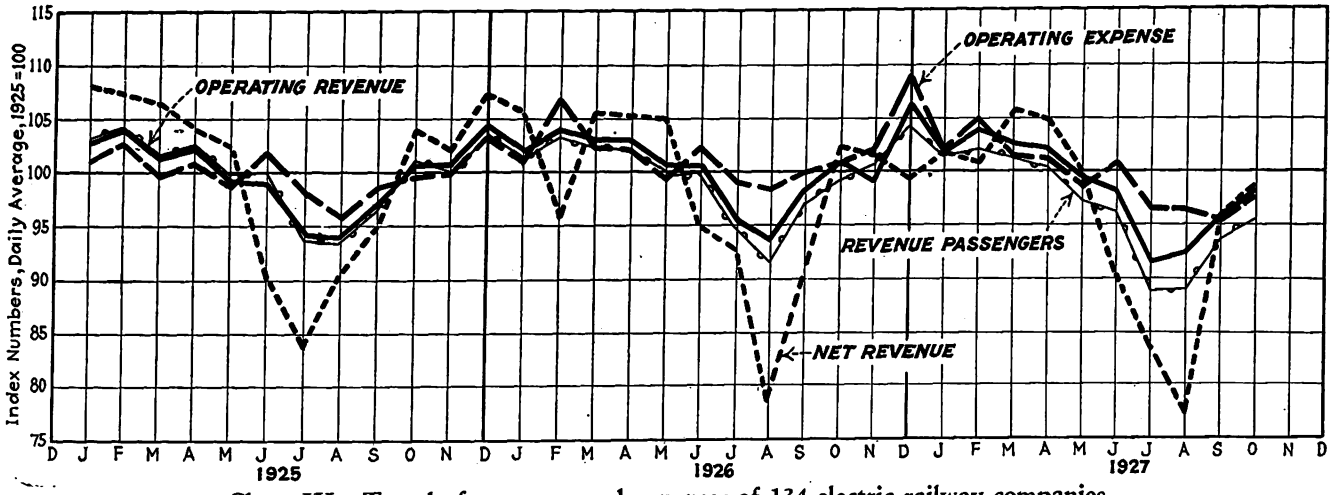
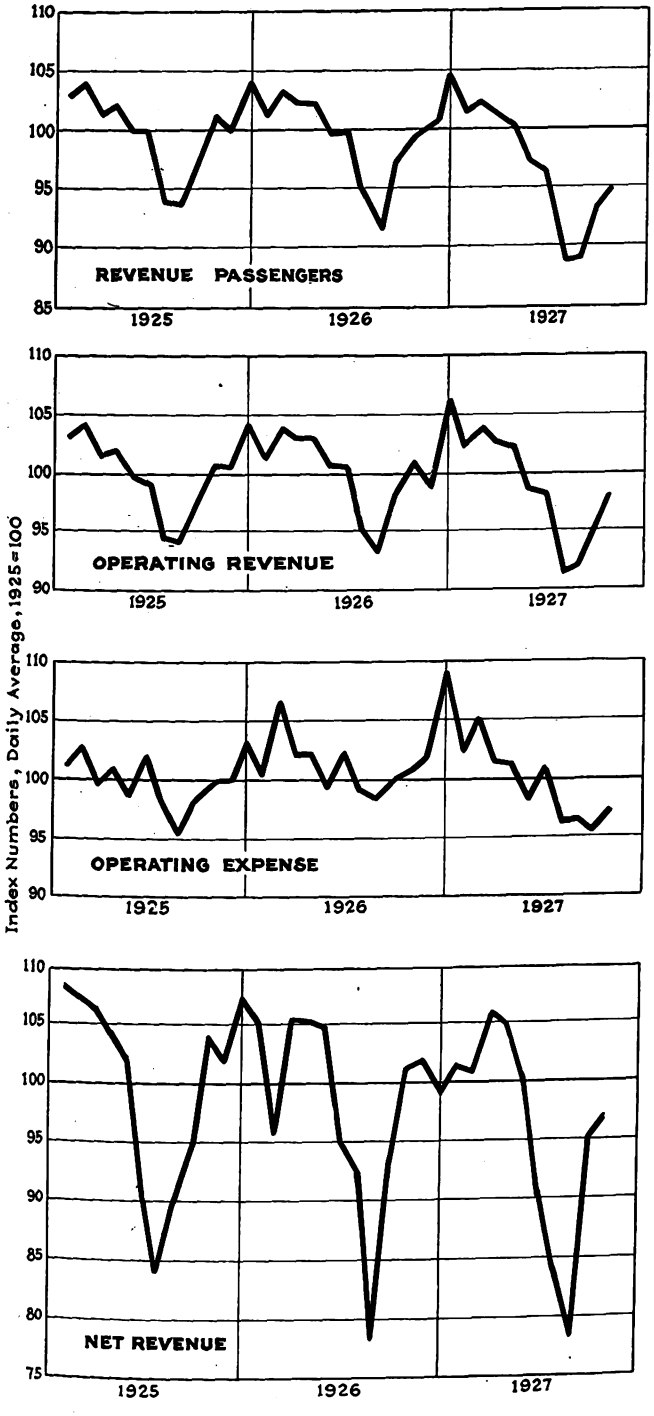


Chart III—Trend of revenues and expenses of 134 electric railway companies

These curves, showing the variations through 1925-27, were prepared by the A.E.R.A. For the period July-October, 1927, the number of companies included is somewhat less than the above number.



considerable extent on account of the pleasure riding in the summer, as well as to the difficulty of providing reliable service under trying winter conditions. With the advent of the automobile there has been a gradual change in the character of the riding on public transportation systems, so that today there is a maximum amount of traffic during the winter months, with a lower amount of business in the summer. The pleasure riding being absent, there is a further reduction in summer because some patrons are on vacations, and many who depend on transportation service in bad weather walk when the streets are clear and the skies are bright. Also, automobiles are used to a greater extent in summer.

As the use of automobiles has increased there has been a change in the character of electric railway traffic which has given concern to many operators. The use of street cars for the wage earner to ride to and from work has gone up, while the incidental use of the cars for shopping and transient riding virtually has stood still. This has accentuated the peaks of traffic, so that while more cars have been needed to carry the peaks fewer are needed for the all-day riding.

Under conditions as they exist today, it is not possible to consider public transportation without taking into account the growth in magnitude of the private automobile as a competitor. As mentioned previously, the advent of this vehicle has had a profound effect on all public transportation methods. Chart II, which shows the relation between the number of electric railway passengers and the automobile registration by years, is of marked interest. It will be seen at a glance that while the number of automobiles in use has grown by leaps and bounds it has not had any great effect in depressing the total demand for public transportation service. The upper portion of the chart shows total electric railway passengers for each year. There has been a practically constant number of riders throughout the period. In the meantime, the number of registrations of automobiles has increased from about 4,500,000 in 1917 to 20,140,000 in 1927, and beside this there has been a much greater use made of each automobile, as their design and relia-

Chart IV—A comparison of the trends of operating revenue, operating expense, net revenue and revenue passengers carried

The information is the same as that used in Chart III, separated for greater clearness. Seasonal variations in revenue passengers are reflected in the operating revenues and net income.

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bility has improved. A striking illustration of the growth in automobile ownership is that while in 1917 there was about one auto to every 22 persons in the United States, in 1927 there was more than one to every six persons.

Trend of Operations in 1927

The trend of traffic revenues and expenses is shown in Chart III for a group of 134 properties, except for the months subsequent to June, 1927, for which the number of companies is somewhat less, as complete reports are not available. Similar information is shown plotted independently in Charts IV-a, b, c and d. The results for 1927 were slightly under those for the previous year, although the last few months indicate that conditions are improving.

As an indication of the efficiency with which public transportation is being furnished, the corresponding figures for the same group of roads have been plotted in Chart V on a car-mile basis. In general the operating revenue per car-mile is slightly higher in 1927 than it was in 1926. Operating expenses per car-mile, which reached a peak in December, 1926, have fallen almost steadily in 1927, so that toward the end of the year they were under the corresponding months for 1926. The net revenue per car-mile has increased because of the higher operating revenue and lowered expenses per car-mile.

It is quite noticeable that with the reduced traffic in the summer time expenses are not reduced proportionately, and the net revenue has a drop in this portion of the year out of all proportion. This may be accounted for by the necessity for providing a return on the fixed investment, as the net operating revenue per car-mile shows less fluctuation with the seasons than does the gross.

Fare Situation Is Improved

The failure of fares to increase in proportion to the demands made on the companies is shown in Chart VI. There was a lag of about four years, 1913-1916 inclusive, when there was virtually no increase in fares, while wages had gone up nearly 20 per cent. As time went on the difference between wages and fares has become greater, so that today wages are about 110 per cent above the pre-war basis, while fares have gone up only some 55 per cent.

Rates of fare during the past eleven years are shown in Chart VII. It will be noted that in 1917 the 5-cent fare was all but universal, 273 companies out of a total of 303 companies charging 5 cents. There were five companies using zone fares and 25 with 6-cent fares, higher rates being unknown. The 7-cent and 8-cent fares appeared in 1918 and the 9-cent and 10-cent fares in 1919. Today the 10-cent fare is the most popular, 102 companies having this rate, while only 39 companies retain the old 5-cent fare.

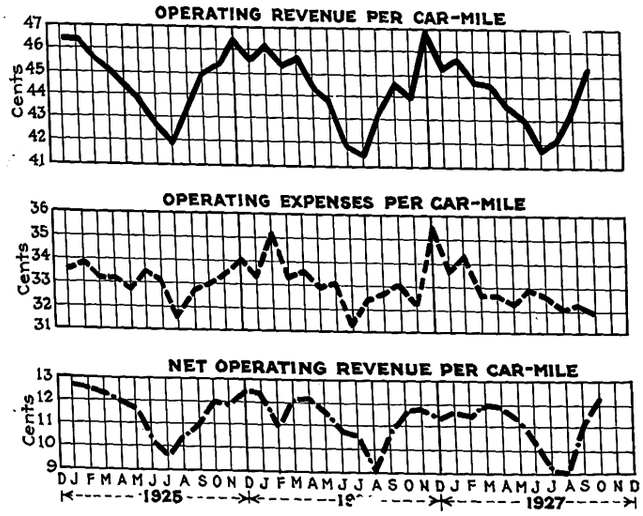

Chart V—Trends of operating revenue, operating expense and net operating revenue, in cents per car-mile

The trends are here plotted for the same group of companies as Charts III and IV. The information was prepared by the A.E.R.A.

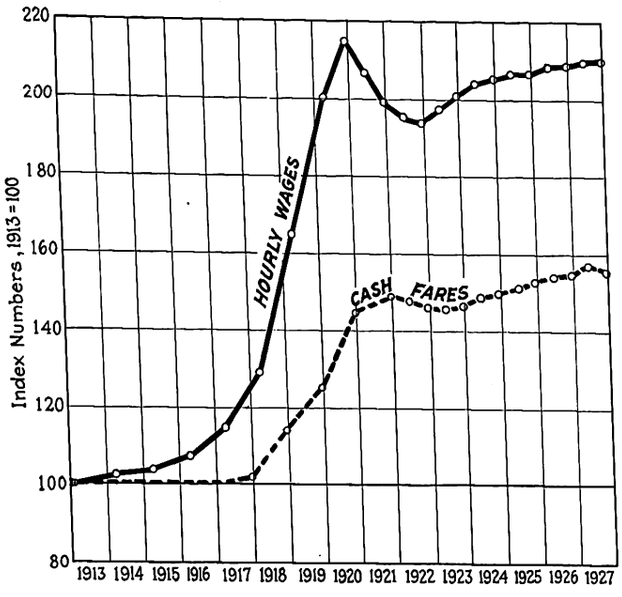

Chart VI—Relative increase in fares and wages in the United States

This comparison, made from information collected by the A.E.R.A., shows that wages have increased 110 per cent since 1913, while cash fares have advanced only 58 per cent.

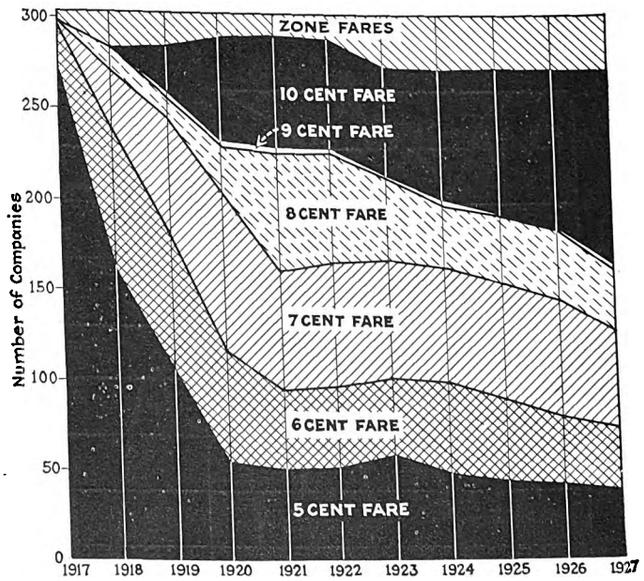

Chart VII—Distribution and trend of cash fares, 1917-1926

This chart, prepared by the A.E.R.A., shows the rapid decline in the use of the 5-cent fare and the corresponding increase in the 10-cent fare and other higher rates.

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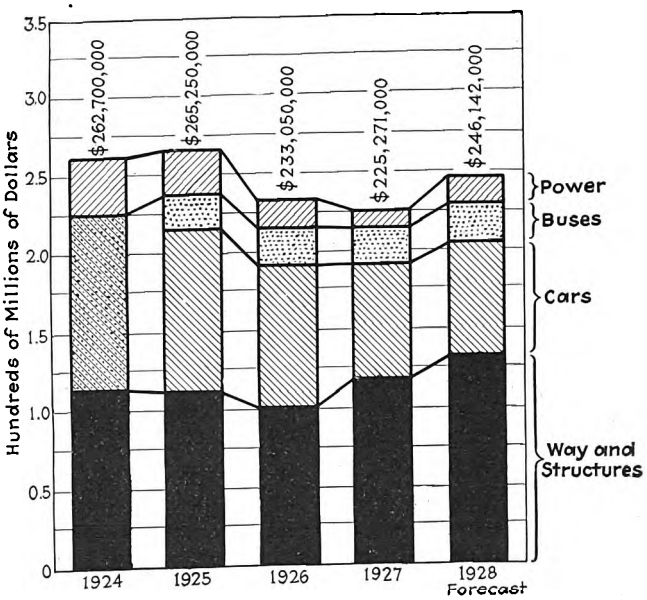
$246,142,000 Expenditure

Planned for Plant and Materials in 1928

This figure, the largest for several years, follows a slight recession in 1927. Large expenditures for track construction in contemplation indicate confidence in rail transportation



Expenditures planned for 1928 by the electric railways show a healthy increase over 1927

BUDGETS of the electric railways show that more expenditures for plant and maintenance materials are contemplated for this year than for any year since 1925. New plant chargeable to capital account is estimated at $147,716,000 and maintenance materials at $98,426,000. The total of $246,142,000, exceeds the actual amount spent by the railways in 1927 by $20,871,000, or 8.5 per cent.

Expenditures in 1927 showed a recession from previous years; in fact, they were the lowest since the JOURNAL has been preparing these estimates of capital expenditures, the first of which was published at the beginning of 1923. It is significant, however, that the reduction was on account of lower expenditures for maintenance materials, for the purchases chargeable to capital account add up to the highest total since 1924. In the preparation of these estimates the practice of

Purchases Planned by Electric Railways for 1928, Compared with Actual Estimates of Past Years Prepared by "Electric Railway Journal"

New Plant and Equipment—Capital

	1924	1925	1926	1927	Forecast 1928
Way and structures	$56,000,000	$52,400,000	$51,200,000	$77,365,000	$89,677,000
Cars	60,200,000	50,400,000	40,000,000	34,758,000	35,495,000
Buses		15,680,000	17,540,000	14,368,000	15,164,000
Power	17,000,000	5,150,000	7,640,000	3,561,000	7,380,000
Total	$133,200,000	$123,630,000	$116,380,000	$130,052,000	$147,716,000

Maintenance Materials and Supplies—Operating

Way and structures	$57,500,000	$56,900,000	$50,000,000	$40,517,000	$41,697,000
Cars	54,000,000	54,700,000	47,800,000	36,941,000	37,288,000
Buses		7,370,000	7,500,000	9,451,000	10,294,000
Power	18,000,000	22,650,000	11,370,000	8,310,000	9,147,000
Total	$129,500,000	$141,620,000	$116,670,000	$95,219,000	$98,426,000

Total of New Plant and Maintenance Materials and Supplies

Way and structures	$113,500,000	$109,300,000	$101,200,000	$117,882,000	$131,374,000
Cars	114,200,000	105,100,000	87,800,000	71,699,000	72,783,000
Buses		23,050,000	25,040,000	23,819,000	25,458,000
Power	35,000,000	27,800,000	19,010,000	11,871,000	16,527,000
Grand total	$262,700,000	$265,250,000	$233,050,000	$225,271,000	$246,142,000

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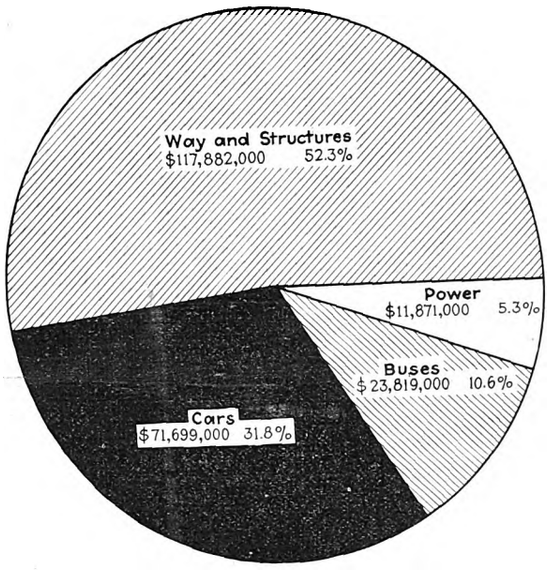


How the total of $225,271,000 expended in 1927 for new plant and maintenance materials and supplies was divided

former years was followed of obtaining from a survey of the industry the actual expenditures for 1927 and the proposed expenditures for this year from budget estimates and plans furnished by operating managements. The information included in these reports was prorated to cover the industry. Not only were the number of cars and miles of track considered, but a study of the individual returns was made to eliminate the influence of unusual circumstances.

Track Expenditures Large

Probably the most significant tendency shown by the figures is the large increase in expenditures for track. Actual expenditures in 1927 for track materials were 50 per cent greater than in 1926, which was but slightly below the amounts expended in the previous two years. Notwithstanding this, the expenditures for way and structures materials planned for 1928 exceed the 1927 total by another 19 per cent. With such a program for rehabilitation it is only natural that there should be some reduction in the expenditures for track maintenance. The total to be expended on way and structures for 1928 shows a large gain, both in 1927 and in the forecast for 1928. The indication is that there will be no let-down from the standard of track maintenance set in 1927, for those portions of existing lines not included in the rebuilding programs.

Not only were car purchases for 1927 considerably lower than in the previous year, but the expenditures definitely planted for 1928 show only a small increase. The total proposed is $35,495,000, which is far below the amount spent for cars in any one of the years 1924-1926.

This may logically be considered to reflect the present unsettled car situation and the inability of managements clearly to forecast their car purchases pending the outcome of the widespread experimentation in car design. It is probable that the forecast figure for car expenditures will be considerably exceeded in 1928 by stimulated buying following successful operating experience with some of the newer types of design.

Maintenance material purchases planned for this year, while slightly larger than for last year, are still much below those for previous years. An analysis of the total capital expenditures and a comparison with the reports of cars purchased shows that a considerable amount of rehabilitation and rebuilding work on present equipment was charged to capital account.

Bus purchases planned for 1928 are slightly greater than the record of 1927, indicating a normal growth of this branch of the industry. While the total of more than $15,000,000 is less than the expenditures in the period of most rapid expansion in the use of buses, it indicates that this vehicle continues to be looked on as a necessary part of the railway plant. Success being achieved in the use of buses by electric railways to give preferred forms of service at a distinctly higher level of fares may result in materially increased expenditures for new buses than are indicated in the budget figures. The success achieved by single-deck buses of increased seating capacity and the alertness of bus manufacturers to the improvement of their products may likewise bring about considerably increased buying.

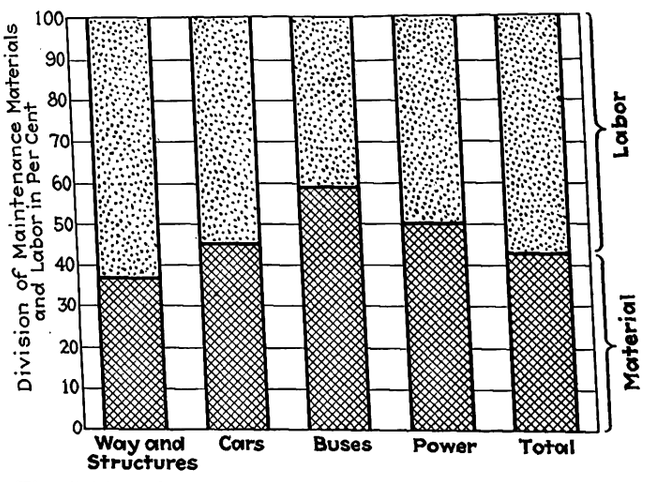
Bus maintenance materials show a considerable increase in 1927, and a still further increase is planned for 1928. The indication is that the need for heavy maintenance on buses purchased three or more years ago is becoming increasingly apparent and must be provided for.

The estimates for power expenditures on capital account were more difficult to make than for the other items, since there is some uncertainty in the replies as to the inclusion of purchased power. The returns this year enabled a better segregation to be made, so that the reduction in this item for 1927 as published does not necessarily mean a recession in the account. Since the forecast for 1928 was made on the same basis as the figure for 1927, a material increase in capital expenditures for power facilities can be expected.

Maintenance Materials and Labor Segregated

In previous budget surveys it has been exceedingly difficult to make a correct segregation of labor from the expenditures planned for materials. Although only materials were asked for, there always was some doubt as to whether the replies made proper allowance for this. In the forms which were used this year separate items of maintenance materials and maintenance labor were provided. The returns which were received were remarkably complete and the segregation was made with comparatively little difficulty.

Of the total maintenance expenditures for the year



The division of expenditures made in 1927 for maintenance into materials and labor is indicated for the elements of way and structures, cars, buses and power

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Maintenance Materials and Labor

		Way and Structures	Cars	Buses	Power	Total
1927 Expenditures	Material	$40,517,000	$36,941,000	$9,451,000	$8,310,000	$95,219,000
	Labor	66,874,000	44,952,000	6,592,000	8,244,000	126,662,000
	Total	$107,391,000	$81,893,000	$16,043,000	$16,554,000	$221,881,000
1928 Estimated expenditures	Material	$41,697,000	$37,288,000	$10,294,000	$9,147,000	$98,426,000
	Labor	68,232,000	45,680,000	7,471,000	8,144,000	129,527,000
	Total	$109,929,000	$82,968,000	$17,765,000	$17,291,000	$227,953,000

1927, amounting to $221,881,000, the amount paid out for maintenance materials was $95,219,000, or 42.9 per cent; $126,662,000, or 57.1 per cent, was for labor. Roughly, these amounts are respectively three-sevenths and four-sevenths of the total.

In the way and structures accounts, the proportion spent for materials is the lowest, being only 37.7 per cent. This was to be expected, on account of the low relative cost of track materials and the great amount of hand labor involved.

Car maintenance costs show that 45.1 per cent is spent for materials and 54.9 per cent for labor. Contrasted with this, bus maintenance requires an expenditure of 58.8 per cent of the total for materials and only 41.2 for labor. This difference is quite marked, varying but little throughout the individual returns.

Power maintenance requires an almost equal division of the items, 50.2 per cent going for materials.

Estimated labor and material figures for 1928 give practically the same relations between materials and labor as the figures for 1927, checking the proportions. Of the total of $227,953,000 to be spent, $98,426,000, or 43.2 per cent, will be for materials. The figures for way and structures maintenance show an increase of 3.6 per cent for materials.

The complete tables for the two years are included, and the proportions of labor and materials for the several items are given in the accompanying chart.

Statements from Leading Executives Give

High Spots of the Year's Operation

While traffic was somewhat less in 1927, better business is anticipated by many leading operators. Comments indicate that progressive measures have resulted advantageously to the companies adopting them

EXECUTIVES of electric railway companies all over the United States and Canada indicate that the present year bids fair to show revenues higher than those of 1927. While final figures for the entire country are not available, indications are that last year's traffic will be about 1 per cent under the 1926 record of sixteen billion passengers. Progress has been made, however. The reduction in general business has had only a minor effect on the transportation companies.

As Managing Director Storrs sees it, the industry enters upon 1928 with promise of a continued upward swing in its affairs. He considers the outstanding accomplishments of 1927 to be the service improvements that have been made, and the work that has been started in the development of modernized cars that are attractive, light-running and less noisy. He regards as very important the co-ordination under electric railway managements of all major local transportation facilities, including rail cars and buses and in some instances taxicabs. He also regards it as significant that many communities have, with public approval, adjusted fares to a point approximating compensation for good service rendered.

President Stevens anticipates a continuation of the substantial progress made by the electric railways during the year. In his opinion even more progress can be anticipated than in any other year for a long time, first, because of the general awakening of the public to the fact that electric railway transportation cannot be dispensed with; second, because experience in operating buses has determined their limitations as well as their advantages and, third, because the opportunity exists to take advantage of the great progress that has been made in car design and construction.

The opinion of these and other prominent executives on the results of last year's business and the prospects for the coming year are given on the following pages.

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American Electric Railway Association

CONDITIONS in the local transportation field throughout the United States and Canada improved during the last year. The industry enters upon the year 1928 with promise of a continued upward swing in its affairs.

Outstanding accomplishments during 1927 are service improvements, particularly in the installation of modernized cars that are comfortable, light-running and less noisy. Co-ordination of major transit facilities, including rail cars and buses and in some cases taxicabs under electric railway managements, has been made.

Rates of fare in many communities have been adjusted, with public approval, to a point approximating adequate compensation for good service rendered.

The industry is no longer merely waiting for "necessity riding." The managements realize that if the electric railways companies are going to compete successfully with their keenest competitor, the private automobile, they must render service that will attract those who have been using this personal means of conveyance. While the rail car is the most economical vehicle for mass transportation the bus also has shown that it is a great supplemental aid in a general transportation service. Co-ordinated under single managements these two vehicles give the best possible local transportation.

Because the industry is viewing its future usefulness with recognition of the changed conditions and requirements for its service, and is no longer allowing its expansion to be circumscribed by a mere statistical vision of its past history, the indications for 1928 are better than in any other recent year.

L. S. STORRS,
Managing Director.

American Electric Railway Association

FOR the year 1928, I can anticipate continuation of the substantial progress made by the electric railways in the past year. In my opinion, even more progress can be anticipated than in any other year for a long time; first, because of the general awakening of the public to the fact that electric railway transportation cannot and is not going to be dispensed with; second, because experience in operating buses has determined their limitations as well as their advantages; and third, because of the opportunity which exists to take advantage of the great progress that has been made in street car design and construction.

The purpose of every electric railway system is to supply its communities with a service that will meet the public needs; be so acceptable that the revenues will pay for that service and yield a proper return to those whose investments have made the service possible, thus inviting new capital at reasonable cost to meet ever-expanding requirements. With public consciousness awakened to the realization that electric railway transportation is essential to community progress, the electric railway situation has made rapid strides during the past year. It is true that during the last few years traffic has grown very little, and that even in some places the number of revenue passengers has decreased, but this is due no doubt to the intense competition of private and public automobiles, especially the former.

Notwithstanding this experience in the past, history furnishes no ground for the opinion that the street car is becoming obsolete. The bus lines are handling only a very small proportion of the total number of passengers carried and, as a general rule, are not giving indications that they may be expected to handle any material increase in the percentage of the total local transportation.

To me, the greatest progress in electric railway transportation the past year was the long stride taken in the development of the new types of cars and equipment which, although they are not fully developed and therefore do not yet accomplish the desired results, indicate a great awakening as to the necessity of real sales effort and attractive possibilities for the increase of railway revenues.

R. P. STEVENS,
President.

We believe the prospects for this year are good through better public understanding, through the ride sales campaign participated in by every employee and through the development of public opinion. Traffic congestion is still a problem, but with growing recognition of the efficiency of the street car it is becoming less acute. [B. J. YUNGBLUTH, Buffalo]

Houston Electric Company

Houston, Texas

WITH the fare increase which has been effective for the past six months, we will show a 10 per cent increase in our gross earnings for 1927. Our estimates will call for a further increase in gross revenue of 10 per cent for the coming twelve months. Seventy per cent of this should find its way to the net. The public is showing great interest and appreciation in the new equipment which was furnished during the past year, indicating that service to the patrons is more important than the cost. All signs point to an improved showing for 1928.

JEFF L. ALEXANDER,
Manager.

Southern Pacific Company and Pacific Electric Railway

Los Angeles, Cal

EARNINGS of the electric railways continue to be unsatisfactory although our principal interurban system, the Pacific Electric Railway, has made in 1927 a materially improved showing over 1926, largely due to freight traffic. The electric railways and street car systems in the smaller towns just about held their own where there were no unusual circumstances affecting results. So far as 1928 is concerned, it does not seem probable there will be any material change from 1927. There has been no increase in expenses except where extraordinary maintenance has been a factor.

PAUL SHOUP,
President Pacific Electric Railway; Vice-President Southern Pacific Company.

Cleveland Railway

Cleveland, Ohio

VOLUME of traffic of the Cleveland Railway was less in 1927 than in 1926, which had been slightly greater than the preceding year. In my opinion this reflected lessened industrial and trade conditions rather than competition from privately owned motor cars.

With declining traffic late in 1925 our rate of fare was advanced under our service-at-cost plan so that our passenger receipts last year were the largest in our history. This combination made possible improved service with lessened expense. Material reductions in maintenance, in power and in the cost of injuries and damages were effected. I believe we have touched the low of traffic recession and with service on a higher plane the coming year will bring us better results than the past year.

JOSEPH H. ALEXANDER,
President.

Chicago Rapid Transit Company

Chicago, Ill.

TRAFFIC on the Chicago Rapid Transit Company lines decreased about 1 per cent in 1927. Passenger and freight traffic on the interurban lines increased satisfactorily. Wages and other charges were somewhat higher on all properties. We look for normal improvement in both passenger and freight traffic for 1928.

BRITTON I. BUDD,
President.

International Railway

Buffalo, N. Y.

IMPROVED public relations resulting from a better understanding of the transit problem on the frontier is the outstanding achievement of last year in Buffalo. The need for a financially sound transit system providing efficient,

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courteous service is generally recognized and is resulting in a more sympathetic public attitude. Considerable track and paving reconstruction was done in 1927, equipment maintenance standards were raised and employee morale was greatly strengthened. The motorbus lines recently installed are well patronized, resulting in extensive improvements in this service. We believe the prospects for next year are good through better public understanding, through the ride sales campaign participated in by every employee and through the development of public opinion. Traffic congestion is still a problem, but with growing recognition of street car efficiency it is becoming less acute.

B. J. YUNGBLUTH,
President.

We are optimistic on next year's business. Atlanta's building program, with the city's natural growth, taken in connection with our recent fare increase, should give the Georgia Power Company the most prosperous year since 1920. [F. L. BUTLER, Atlanta]

Denver Tramway Corporation

Denver, Col.

OPERATING revenue of the Denver Tramway Corporation for 1927 continued to decline. It was necessary to pass most of the decrease down to the net, as the operating economies effected during the year were more than offset by the higher prices which had to be paid for fuel requirements on account of a strike in the Colorado coal fields. Expenses for 1928 will show no decreases unless one-man operation is further extended, while the trend of travel still seems to be downward. We trust that this year, however, will witness the satisfactory culmination of many years of litigation over franchises and rates, which may be the long-looked-for turning point for the better.

H. S. ROBERTSON,
President.

Birmingham Electric Company

Birmingham, Ala.

GROSS earnings of the Birmingham Electric Company during the past year decreased 3 per cent, due chiefly to part-time operations in local industrial plants. Operating expenses showed a small increase over 1926, due chiefly to the increased wage scale for platform men. The comprehensive rerouting plan effected in June, 1927, as a result of a traffic survey, has resulted in a substantial saving in car-hours, which will reduce the operating ratio in 1928.

J. S. PEVEAR.
Vice-President in Charge of Operation.

New Orleans Public Service, Inc.

New Orleans, La.

REVENUE for 1927 shows a decided decrease over last year. We are not able to predict for next year, owing to the uncertainty of the national program in connection with the Mississippi Valley.

H. B. FLOWERS,
President.

Indianapolis Street Railway

Indianapolis, Ind.

TOTAL gross earnings of the Indianapolis Street Railway for 1927 were $5,410,000 as compared with $5,518,000 for 1926. Total operating expenses in 1927 were $4,089,000, as compared with $4,269,000 for 1926. Net earnings less taxes for 1927 were $1,013,000, as compared with $594,700 for 1926. During 1927 five substations were built in Indianapolis, resulting in a substantial reduction in the cost of power. The entire stock of competitive bus lines was acquired at the close of 1927 and all buses will be jointly operated in 1928. The adoption of tokens has resulted in a more systematic method of collecting and accounting for fares. We are operating 100 one-man cars out of a total of 300. It is anticipated that these economies in operation will result in material saving for 1928.

ROBERT I. TODD,
President.

Boston Elevated Railway

Boston, Mass.

BOSTON Elevated Railway traffic slightly decreased during 1927 but the net revenue will be greater than a year ago. We look forward to a substantial year in 1928, both in traffic and operating efficiency.

EDWARD DANA,
General Manager.

I believe we have touched the low of traffic recession and with service on a higher plane the coming year will bring us better results than the past year, especially the latter part.

[JOSEPH H. ALEXANDER, Cleveland]

Portland Electric Power Company

Portland, Ore.

REVENUE on the Portland Electric Power Company city lines has shown a steady decrease since 1921, due to increasing inroads by automobiles. The year 1927 was no exception. Gross revenues on the city lines, including buses, decreased 2.62 per cent in spite of an increase of 2 per cent in car and bus-miles operated, largely occasioned by an increase in bus service. Operating expenses of cars and buses decreased 0.65 per cent, due to extension of one-man operation which more than offset increased cost of operating additional buses. Substantial sums spent in modernizing equipment and in extensive advertising campaigns apparently had no influence in retarding the steady drop in revenues. During 1928 we will attempt to provide necessary extensions of service, but we must make every effort to conserve expense and the general policy will be one of retrenchment.

W. H. LINES,
Vice-President in Charge of Railways.

The public is showing great interest and appreciation in the new equipment, . . . indicating that service to the patrons is more important than the cost. All signs point to an improved showing for 1928. [JEFF L. ALEXANDER, Houston]

Capital Traction Company

Washington, D. C.

TRAFFIC on the Capital Traction Company in 1927 was a great disappointment. Automobile competition was felt more severely than in any previous year and caused a falling off in revenue passengers of 4.25 per cent. As expenses and fixed charges were practically the same as in 1926, the net income was materially decreased. The determined drive for selling low-priced automobiles now apparent give little room for optimism in the future and increased rates of fare seem inevitable.

J. H. HANNA,
President.

Dallas Railway & Terminal Company

Dallas, Texas

THE business of the Dallas Railway & Terminal Company showed a falling off in 1927 compared with 1926 of approximately 7 per cent in the number of passengers carried. Due to operating economies, principally the employment of more one-man cars in service, we were able, however, to earn and pay our permitted return of 7 per cent on the property value. A great deal of replacement work has been done during 1927 on the property, but our reserves are in such a depleted condition we have found it necessary to apply to the City Commission for an increased fare. This application was presented on Jan. 9, asking for a 10-cent cash fare with five tickets for 35 cents. Should this re-

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quest be granted we feel that we will be able greatly to improve the condition of our property and our service to the public during 1928.

RICHARD MERIWETHER,
Vice-President and General Manager.

The outlook for 1928 is more encouraging as to gross business, with no apparent extraordinary burdens in operation. [J. P. BARNES, Louisville]

Washington Railway & Electric Company

Washington, D. C.

WASHINGTON Railway & Electric Company shows 1.36 per cent decrease in revenue passengers carried in 1927 compared with 1926. Operating revenues show a slight increase and operating expenses a slight decrease, leaving approximately 5 per cent increase in operating income. We look for further improvement in 1928.

WILLIAM F. HAM,
President.

Brooklyn City Railroad

Brooklyn, N. Y.

BEGINNING the year 1928, the electric railway industry in spite of the present turmoil over transportation matters in New York, never faced a brighter outlook. There will doubtless always be a golden calf that will receive a certain amount of worship, but the electric railway is and will continue to be the backbone of urban mass transportation, and this fact is being recognized to a greater degree each day.

The industry has passed through its most trying period.

C. E. MORGAN,
Vice-President and General Manager.

Toronto Transportation Commission

Toronto, Ont., Canada

TRAFFIC in 1927 on the Toronto Transportation Commission's system has been quite satisfactory and approximately 4,260,000 more passengers were carried on the street railway and motor bus lines than in 1926. At our average fare of 6.17 cents this results in about $260,000 improvement in gross revenue. In addition, our motor coach operations at separate fares and not in competition with the railway have shown remarkable growth and total $580,000, or 90 per cent more than last year. The total of operating expenses slightly increased in 1927 because of more business, but the unit per car-mile is reduced and is now 28 cents exclusive of depreciation. Our operating ratio is also reduced to 61.5. About 16 per cent of our car mileage is one-man operation. Business conditions appear favorable for 1928 and we hope for continued improvement in traffic in spite of the very serious competition from private automobiles.

D. W. HARVEY,
General Manager.

Philadelphia Rapid Transit Company

Philadelphia, Pa.

ALTHOUGH the latter portion of 1927 witnessed a definite falling off in street car riding in Philadelphia, there seems to be no occasion for grave alarm concerning prospects for the current year. It is probable that the decrease in riding was occasioned by a temporary slowing up of industry in this section. Excellent records have been established by the Philadelphia Rapid Transit Company during 1927 for accident reduction and for operating economies. In the current year we shall aim toward a further co-ordination of public transportation media in this city. It is not expected that traffic and operating expenses will fluctuate materially during 1928.

R. T. SENTER,
President.

We look forward to a substantial year in 1928, both in traffic and operating efficiency. [EDWARD DANA, Boston]

Georgia Power Company

Atlanta, Ga.

STATISTICS for 1927 are not available until next week, but the Georgia Power Company expects a decrease of 2½ per cent in operating revenue and 2 per cent in expenses. We are optimistic on next year's business. Atlanta is building two viaducts at a cost of $2,000,000, a new $1,000,000 city hall, and its school-building program calls for between three and four million. This program, with the city's natural growth, taken in connection with our recent fare increase, should give the Georgia Power Company the most prosperous year since 1920.

F. L. BUTLER,
Vice-President in Charge of Operation.

Louisville Railway

Louisville, Ky.

EARNINGS of the Louisville Railway fell off by about 1.23 per cent due to reduced riding. This is probably a reflection of rather quiet business conditions, especially during the summer. The net result of the year's operation is approximately one quarter million dollars applicable to common stock. A 3 per cent dividend was paid. The outlook for 1928 is more encouraging as to gross business, with no apparent extraordinary burdens in operation.

J. P. BARNES,
President.

TO ME, the greatest progress in electric railway transportation the past year was the long stride taken in the development of the new types of cars and equipment which, although they are not fully developed and therefore do not yet accomplish the desired results, indicate a great awakening as to the necessity of real sales effort and attractive possibilities for the increase of railway revenues.

—R. P. STEVENS.

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Marked Increase in
Track Construction in 1927

Mileage of electric railway track rebuilt exceeded that of any other recent year. Extensions were slightly less than in 1926. Amount of track abandoned was small compared with amount of new bus routes added

GREATER activity in track reconstruction was shown by the electric railways in the year just ended than in any other year since 1917. Reports received by this paper from more than 650 companies indicate that approximately 900 miles of track was rebuilt in 1927. This is the largest figure of any year for which records are available. At the same time, extensions to city and interurban trackage and electrified steam lines totaled more than 300 miles, making the sum total of all trackwork done by the electric railway industry last year about 1,220 miles.

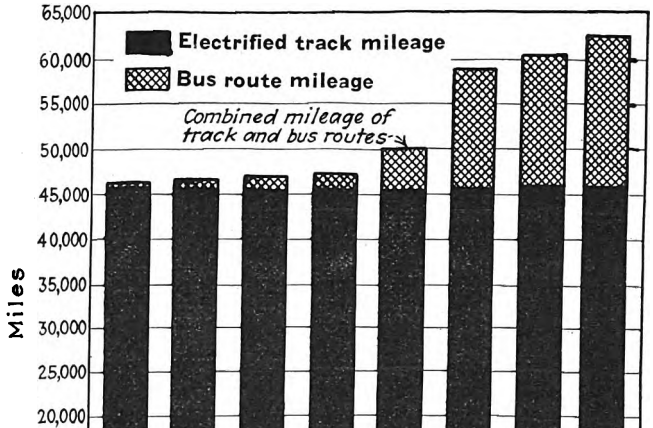
Altogether 217 electric railways reported track rebuilt during the past year. This was an increase over 1926, when 181 companies made such reports, and 1925, when the number was only 160. Approximately 700 miles of city track was rebuilt, as compared with 600 miles the preceding year. Reconstruction of interurban track totaled approximately 200 miles, or very nearly the same amount as was reported for the preceding year. Companies which rebuilt interurban track last year numbered 67, as compared with 63 in 1926 and 46 in 1925.

Extensions to city track last year totaled about 150 miles, or somewhat less than the total for the year before, which was about 200 miles. The number of companies making extensions to city track, however, was slightly larger than the year before, although it was less than two years ago, the figures being 80 in 1927, 75 in 1926 and 80 in 1925. Extensions to interurban track in 1927 were substantially less than the preceding year, due to the absence of any large extension programs. Nevertheless, 34 electric railways reported a total of approximately 40 miles of interurban trackage added during the year.

Comparison of Track Construction by Years

Year	No. of Companies	Track Extensions — Miles — City	Track Extensions — Miles — Interurban	Track Extensions — Miles — Total	Track Rebuilt — Miles — City	Track Rebuilt — Miles — Interurban	Track Rebuilt — Miles — Total	Electrified Steam Lines, Miles
1908	157	(a)	(a)	1174.5	(a)	(a)	(a)	84.00
1909	160	(a)	(a)	774.7	(a)	(a)	(a)	112.40
1910	217	(a)	(a)	1204.8	(a)	(a)	(a)	192.40
1911	223	(a)	(a)	1105.0	(a)	(a)	(a)	86.50
1912	171	(a)	(a)	869.4	(a)	(a)	(a)	80.80
1913	181	(a)	(a)	974.9	(a)	(a)	(a)	119.00
1914	163	(a)	(a)	716.5	(a)	(a)	(a)	229.00
1915	136	(a)	(a)	596.0	(a)	(a)	(a)	448.20
1916	104	115.40	240.90	356.30	(a)	(a)	(a)	388.00
1917	121	251.10	125.60	376.70	(a)	(a)	375.40	66.00
1918	80	216.41	97.41	313.82	(a)	(a)	155.43	275.70
1919	73	110.90	29.67	140.57	307.06	82.82	389.89	287.60
1920	87	145.69	30.87	176.56	246.21	115.56	361.77	8.92
1921	78	108.15	38.95	147.10	488.96	126.25	615.21	8.08
1922	104	126.27	85.11	211.38	584.75	154.95	739.70	12.35
1923	272	169.61	63.54	233.15	559.77	294.86	854.63	26.12
1924	243	218.09	93.99	312.08	585.51	178.82	764.33	83.39
1925	207	227.31	112.48	339.79	485.75	93.15	578.90	236.36
1926	236	193.20	124.76	317.96	594.35	208.17	802.52	169.52
1927	235	152.99	39.42	192.41	691.34	196.60	887.94	140.70

(a) Information not available.



Combined track and bus mileage of the electric railways has increased more than one-third since 1920

In 1926 companies which built new interurban track numbered 38 and in 1925 the number was 35. An accompanying chart shows graphically the comparative amount of reconstruction by years since 1919, as well as the annual additions to electric railway trackage.

First place among the city companies which rebuilt track last year is held by the Chicago Surface Lines with some 45 miles of reconstruction. The Pittsburgh Railways and the Philadelphia Rapid Transit Company come next in order, with about 30 miles of reconstruction apiece. Other electric railways which executed large programs of this kind during the past year include the Kansas City Public Service Company, Cincinnati Street Railway, Public Service Railway of New Jersey, St. Louis Public Service Company, Key System Transit Company, Los Angeles Railway and the Cleveland Railway. The Illinois Traction System holds first place in reconstruction of interurban track during the past year. Extensive work of a similar nature was done by the Texas Electric Railway and the Pacific Electric Railway.

Outstanding among the extensions to city trackage which occurred during the past year was the addition of more than 29 miles to the New York State Railways at Rochester. This came about through the conversion of a portion of the old Erie Canal into a rapid transit subway through the city. An extension of about 8 miles was made by the Twin City Rapid Transit Company and one

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Table I—Track Extensions and Reconstruction in 1927

Name of Company	Extension, Miles: City	Extension, Miles: Interurban	Rebuilt, Miles: City	Rebuilt, Miles: Interurban
Alabama				
Alabama Power Co.	....	....	2.50	....
Birmingham Electric Co.	2.37	0.38	10.31	0.22
Mobile Light & Railroad Co.	....	....	0.79	3.40
Arkansas				
Arkansas Power & Light Co.	....	....	6.31	....
Intercity Terminal Ry.	....	....	0.38	....
Southwestern Gas & Electric Co.	....	....	1.00	....
California				
Los Angeles Ry.	3.06	....	14.05	....
Key System Transit Co.	1.01	....	14.89	....
Market Street Ry.	0.37	....	3.11	2.82
Municipal Ry. of San Francisco	9.48	....	1.10	....
Pacific Electric Ry.	3.20	6.30	5.50	17.80
Sacramento Northern Ry.	....	2.62	....	0.67
San Diego Electric Ry.	....	....	2.61	....
Southern Pacific Co.	....	....	....	1.97
Colorado				
Denver Tramway	....	....	1.27	0.02
Denver & Intermountain R.R.	....	0.92	0.67	0.05
Ft. Collins Municipal Ry.	....	....	0.97	....
So. Colorado Power Co.	....	....	1.00	....
Connecticut				
Connecticut Co.	0.25	1.31	10.02	6.65
Groton & Stonington Traction Co.	....	....	....	0.50
Delaware				
Delaware Electric Power Co.	....	....	1.93	....
District of Columbia				
Capital Traction Co.	....	....	1.50	....
Washington Railway & Electric Co.	....	....	5.19	....
Florida				
Jacksonville Traction Co.	....	....	2.13	....
Miami Beach Ry.	....	0.85	....	0.85
Municipal Railways, St. Petersburg	2.20	....	0.33	....
Tampa Electric Co.	....	....	7.00	....
Georgia				
Georgia Power Co.	3.31	....	7.34	....
Macon Railway & Light Co.	1.17	....	1.64	....
Savannah Electric & Power Co.	....	....	0.48	0.33
Idaho				
Aurora Elgin & Fox River Electric Co.	....	....	2.77	0.68
Illinois				
Chicago & Joliet Electric Ry.	....	....	0.50	3.00
Chicago, North Shore & Milwaukee R.R.	....	2.61	....	....
Chicago Rapid Transit Co.	....	....	8.90	....
Chicago Surface Lines	2.46	....	44.76	....
Chicago & West Towns Ry.	....	....	5.00	....
East St. Louis & Suburban Ry.	....	....	....	1.52
Fox & Illinois Union Ry. Co.	....	....	0.50	....
Illinois Power Co.	....	....	2.27	....
Illinois Power & Light Corp.	....	....	3.56	....
Illinois Traction System	....	4.66	....	22.67
Indiana				
Chicago, South Bend & Northern Indiana Ry.	....	....	3.34	....
Gary Rys.	0.44	0.02	0.28	....
Hammond, Whiting & East Chicago Ry.	....	....	2.50	....
Indianapolis Street Ry.	0.27	....	5.14	....
Indiana Service Corp.	0.73	....	1.26	0.37
Interstate Public Service Co.	0.62	....	....	....
Northern Indiana Power Co.	....	....	0.30	....
Southern Indiana Gas & Electric Co.	0.50	....	2.56	....
Terre Haute Traction & Light Co.	....	....	1.70	....
Union Traction Co.	0.07	0.15	0.18	0.95
Iowa				
Cedar Rapids & Marion City Ry.	....	....	1.00	....
Des Moines City Ry.	0.06	....	....	....
Sioux City Service Co.	....	....	2.46	....
Tri-City Ry. of Iowa	....	....	0.90	....
Kansas				
Arkansas Valley Interurban Ry.	....	....	....	0.05
Joplin and Pittsburg Railway	....	....	2.00	....
Kansas City, Leavenworth & Western Ry.	....	0.10	1.50	....
Union Traction Co.	....	....	1.25	....
Kentucky				
Cincinnati, Newport & Covington Ry.	....	....	2.27	....
Kentucky Traction & Terminal Co.	....	....	0.63	....
Kentucky Utilities Co.	....	....	0.68	....
Louisville Ry.	0.86	....	2.29	1.53
Louisiana				
New Orleans Public Service, Inc.	0.26	....	4.93	....
Shreveport Rys.	....	....	1.29	....
Maine				
Biddeford & Saco. R.R.	....	....	0.25	....
Cumberland County Power & Light Co.	....	....	1.42	....
Maryland				
Potomac Edison Co.	....	....	0.50	....
United Rys. & Electric Co.	2.07	....	14.00	....
Massachusetts				
Berkshire Street Ry.	0.04	....	0.76	1.14
Boston Elevated Ry.	....	....	10.56	....
Eastern Massachusetts Street Ry.	0.09	....	9.73	4.84
Holyoke Street Ry.	....	....	2.42	....
Greenfield & Montague Transportation Area	....	....	0.08	....
Mass. Northeastern Street Ry.	....	....	....	3.00
Milford & Uxbridge Street Ry.	....	....	0.50	4.00
Springfield Street Ry.	1.62	....	6.29	1.00
Worcester Consolidated Street Ry.	1.10	....	4.89	....
Michigan				
Department of Street Rys., Detroit	5.16	....	9.33	....
Detroit United Ry.	3.66	0.13	4.22	....
Duluth Street Ry.	0.54	....	3.13	....
Grand Rapids R.R.	....	....	0.52	....
Michigan R.R.	....	....	....	0.57
Minnesota				
Twin City Rapid Transit Co.	8.28	0.10	1.87	....
Mississippi				
Mississippi Power & Light Co.	....	....	1.50	....
Missouri				
Kansas City Public Service Co.	1.02	....	21.18	....
Missouri and Kansas Ry.	0.15	....	....	....
Springfield Traction Co.	....	....	1.03	....
St. Francois County R.R.	....	....	1.00	....
St. Joseph Railway, Light, Heat & Power Co.	....	....	2.00	....
St. Louis Electric Terminal Ry.	....	0.04	....	0.16
St. Louis Public Service Co.	0.32	0.03	15.61	2.00
Montana				
Montana Power Co.	0.15	....	2.35	....
Nebraska				
Lincoln Traction Co.	....	....	0.37	....
Omaha & Council Bluffs Street Ry.	....	....	1.50	....
New Hampshire				
Manchester Traction, Light & Power Co.	....	....	1.80	....
New Jersey				
Atlantic City and Shore R.R.	....	....	1.21	....
Public Service Ry.	0.35	....	17.53	0.35
Trenton & Mercer County Traction Corp.	0.51	0.03	1.79	....
New York				
Binghamton Ry.	....	....	0.92	....
Brooklyn City R.R.	0.34	....	4.84	....
Brooklyn-Manhattan Transit Corp.	0.48	....	12.30	....
Fonda, Johnstown & Gloversville R.R.	....	....	0.37	....
Hudson Valley Ry.	....	....	2.23	....
Interborough Rapid Transit Co.	4.22	....	....	....
International Ry.	0.34	0.12	4.45	0.42
Jamaica Central Rys.	....	....	4.00	....
Jamestown Street Ry.	....	....	0.72	....
Manhattan & Queens Traction Corp.	....	....	4.73	....
New York & Queens County Ry.	....	....	3.24	....
New York Rys.	....	....	3.91	....
New York, Westchester & Boston Ry.	....	3.52	....	....
New York State Rys.	29.46	....	10.16	....
Richmond Ry.	....	....	0.32	....
Rochester, Lockport & Buffalo R.R.	....	....	....	0.27
Schenectady Ry.	....	....	2.98	....
Southern New York Ry.	....	....	....	1.00
Syracuse and Eastern R.R.	....	....	....	0.50
Third Ave. Ry.	0.39	....	8.31	....
United Traction Co., Albany	....	....	2.91	....
North Carolina				
Carolina Power & Light Co.	0.41	....	....	....
Durham Public Service Co.	....	....	0.45	....
Tidewater Power Co.	....	....	....	3.00
North Dakota				
Northern States Power Co.	....	....	0.27	0.57
Ohio				
Cincinnati, Hamilton & Dayton Ry.	....	1.72	....	0.70
Cincinnati Street Ry.	....	....	21.12	....
City of Ashtabula, Division of Street Rys.	....	....	0.54	....
Cleveland Ry.	6.08	....	12.04	....
Columbus, Delaware & Marion Electric Co.	....	....	1.30	....
Community Traction Co., Dayton	0.89	....	5.16	....
Indiana, Columbus and Eastern Traction Co.	....	....	....	0.90
Lima-Toledo R.R.	....	0.11	....	....
Nelsonville Athens Elec. Ry.	....	....	0.25	....
Northern Ohio Pwr. & Light Co.	....	....	3.71	1.80
Ohio Public Service Co.	....	....	0.80	....
Pennsylvania-Ohio Electric Co.	....	....	0.92	....
Peoples Ry., Dayton	1.10	....	5.00	5.00
Springfield Ry. Co.	0.14	....	1.70	....
Stark Electric R.R.	....	....	0.75	3.00
Steubenville, East Liverpool & Beaver Valley Traction Co.	....	....	....	3.00
Toledo, Bowling Green & Southern Tract. Co.	....	....	1.52	....
Toledo & Western Ry.	....	....	....	0.51
Western Ohio Ry.	....	....	....	2.30
Youngstown Municipal Ry.	....	....	0.57	....
Oklahoma				
Oklahoma Ry.	0.06	0.57	....	....
Oklahoma Union Ry.	1.25	....	....	....
Tulsa Street Ry.	0.45	....	0.42	....
Oregon				
Portland Electric Power Co.	....	0.68	3.00	0.50
Pennsylvania				
Altoona & Logan Valley Electric Ry.	....	....	2.27	4.00
Beaver Valley Traction Co.	....	....	....	2.65
Conestoga Traction Co.	....	....	1.00	....
East Penn Electric Co.	....	....	0.56	0.68
Erie Ry.	....	....	0.88	....
Harrisburg Ry.	0.17	....	2.50	....
Irwin, Herminie Traction Co.	....	....	....	2.00
Johnston Traction Co.	....	....	1.50	....
Lehigh Valley Transit Co.	....	1.06	2.45	0.44
Northwestern Elec. Service Co.	9.80	....	....	....
Philadelphia & West Chester Traction Co.	....	0.39	....	....
Philadelphia Rapid Transit Co.	1.87	0.24	29.82	4.65

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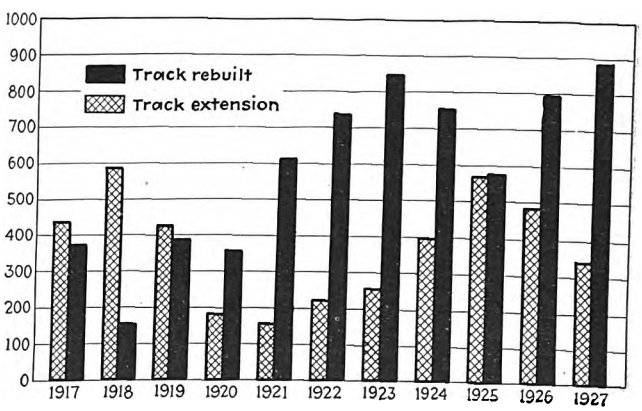
Table I—Track Extensions and Reconstruction in 1927—(Concluded)

Name of Company	Extension, Miles City	Extension, Miles Interurban	Rebuilt, Miles City	Rebuilt, Miles Interurban
Pennsylvania (Continued)				
Phillipsburg Transit Co.	....	....	0.57	....
Pittsburgh Ry.	2.30	0.38	30.56	0.54
Reading Transit Co.	....	....	2.97	2.50
Scranton Ry.	....	....	4.88	9.90
Shomokin & Mt. Carmel Transit Co.	....	....	....	6.00
Sunbury & Selinsgrove Ry.	....	....	0.36	....
Tarentum, Brackenbridge & Butler St. Ry.	....	....	1.10	....
Warren St. Ry.	....	....	0.37	....
West Penn Ry.	0.25	0.04	0.59	1.62
West Chester St. Ry.	....	....	0.50	....
Williamsport Ry.	....	..	0.74	....
York Rys.	....	....	1.25	....
Rhode Island				
United Electric Rys.	2.37	....	3.41	....
South Carolina				
South Carolina Power Co.	....	....	2.27	....
Tennessee				
Jackson Ry. & Light Co.	....	....	0.50	....
Knoxville Power & Light Co.	....	....	3.71	3.49
Memphis Street Ry.	3.02	0.12	0.54	....
Nashville Ry. & Lt. Co.	1.06	....	9.19	....
Texas				
Dallas Ry. & Terminal Co.	0.97	....	7.55	....
Eastern Texas Electric Co.	....	....	0.50	....
El Paso Electric Co.	....	....	2.32	....
Galveston Electric Co.	....	....	2.18	....
Houston Electric Co.	3.78	....	2.71	....
Northern Texas Tract. Co.	0.34	....	7.48	....
San Antonio Public Service Co.	0.46	....	2.26	....
Texas Electric Ry.	....	....	....	21.00
Wichita Falls Traction Co.	0.33	....	0.50	....
Utah				
Bamberger Electric R.R.	....	0.50	....	....
Utah-Idaho Central R.R.	....	....	1.00	....
Utah Light & Traction Co.	0.64	....	5.12	....
Vermont				
Burlington Traction Co.	....	....	0.75	....
Vergennes Power Co.	....	....	0.50	1.20
Virginia				
Arlington & Fairfax Ry.	....	....	....	2.24
Mt. Vernon Alexandria & Washington Ry.	....	....	2.00	3.00
Virginia Electric & Power Co.	5.76	....	6.12	....
Roanoke Railway & Electric Co.	0.40	....	0.27	....
Petersburg-Hopewell & City Point Ry.	1.25	....	....	....
Virginia Public Service Co.	....	....	0.85	....
Sandston Ry.	....	....	0.50	0.50
Washington				
Puget Sound Power & Light Co.	1.02	0.11	....	....
Seattle Municipal Street Ry.	1.67	....	4.39	....
Tacoma Municipal Belt Line.	1.00	....	4.00	....
Willapa Electric Co.	....	....	0.19	....
West Virginia				
Monongahela West Penn Public Service Co.	....	....	1.00	....
Wheeling Public Service Co.	....	....	....	0.30
Wheeling Traction Co.	....	....	....	6.72
Wisconsin				
Madison Rys.	....	....	0.33	....
Milwaukee Elec. Ry. & Light Co.	2.60	2.18	9.03	6.16
Milwaukee Northern Ry.	....	....	0.21	1.00
Wisconsin Gas & Electric Co.	0.91	....	0.72	....
Wisconsin Power & Light Co.	....	....	1.20	1.00
Wisconsin Valley Electric Co.	..	....	0.34	0.49
Northern States Power Co.	....	....	0.70	....
Wisconsin-Michigan Power Co.	0.10	....	0.58	....
Porto Rico				
Porto Rico Railway, Light & Power Co.	....	....	7.00	....
Canada				
British Columbia Electric Ry.	0.63	....	4.14	....
Calgary Municipal Ry.	....	....	1.50	....
Dominion Power Transmission Co.	....	....	4.00	....
Hull Electric Co.	....	....	1.30	....
Hydro-Electric Rys.	....	....	0.70	....
Levis Tramways Co.	0.09	....	0.19	....
London Street Ry.	....	....	1.50	....
Moose Jaw Electric Ry.	....	....	0.74	....
Montreal & Southern Counties Ry.	....	....	0.23	4.03
Montreal Tramways Co.	4.38	2.27	10.73	4.26
New Brunswick Power Co.	....	....	2.00	....
Niagara, St. Catharines & Toronto Ry.	....	1.73	0.63	....
Nova Scotia Tramways & Pwr. Co.	0.35	....	....	....
Ottawa Electric Ry.	....	....	0.64	....
Quebec Railway, Light, Heat & Power Co.	....	....	2.00	....
Regina Municipal Ry.	....	....	0.78	....
Sherbrooke Ry. & Power Co.	0.11	....	....	....
Saskatoon Municipal Ry.	0.45	....	....	....
Toronto Transportation Commission.	0.80	....	3.38	....
Winnipeg Electric Co.	0.75	0.33	4.10	....
	152.99	39.42	691.34	196.60

of 9½ miles by the Municipal Railway of San Francisco. Substantial extensions of city trackage were reported also by the Pacific Electric Railway, Los Angeles Railway, Detroit Department of Street Railways, Detroit United Railway, Interborough Rapid Transit Company, Cleveland Railway, Georgia Power Company, Houston Electric Company, Virginia Electric & Power Company, and the Montreal Tramways. The most notable extensions to interurban trackage were made by the Pacific Electric Railway, Illinois Traction System and the New York, Westchester & Boston Railway.

Another important branch was added to the rapid transit system of the Boston Elevated Railway, Boston, Mass., by the opening, on Nov. 5, of the first section of the Dorchester tunnel extension. This extension runs from Andrew Square, which has been the terminal for some years, to Fields Corner in Dorchester and cost $5,000,000. It is being carried to Mattapan as fast as the work can be done, at an expense of another $5,000,000. The new line is a heavy, rock-ballasted, third-rail road, smooth riding and quiet. The roadbed occupied is the former roadbed of the New Haven Railroad, purchased by the Boston Elevated. This development may lead to the abandonment of more short-haul business by the steam railroads entering Boston, in order that it may be more advantageously handled by the local railways, mainly the Boston Elevated.



Track reconstruction in 1927 was greater than in any other year of the past decade

The New York, Westchester & Boston Railway's extension of its eastern division to a new terminal at Harrison, N. Y., was completed on July 2 and opened for regular service on July 3. With the opening, Harrison became the eastern division terminal, which since March, 1926, had been at Mamaroneck. For fourteen years prior to that time the terminal was at Larchmont. A further extension to Rye is already under way. This makes another step toward the projected establishment of

Electrified Steam Railroad Extensions

	Single Track Miles
N. Y. Connecting R.R.	14.86
New York, New Haven & Hartford R.R.	8.55
Boston Elevated Ry.	5.24
Northeast Oklahoma R.R.	0.41
Canadian Nat'l. Railways (St. Clair Tunnel)	3.50
Pacific Electric Ry.	2.80
Long Island R.R.	93.70
New York & Harlem R.R.	4.86
New York Central R.R.	6.78
	140.70

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Table II—Partial Track Abandonments in 1927

	Miles of Track			
	Service Suspended	Abandoned	Removed	Type of Service
Alabama				
Birmingham Elec. Co.	1.07			City
Arizona				
Street Railway Dept.—City of Phoenix.	6.00			Interurban
Arkansas				
Fort Smith Light & Traction Co.			.45	City
California				
Key System Transit Co.		4.23		City
Market Street Ry.	3.68			City
Pacific Elect. Ry.			3.10	City
			8.40	Interurban
Sacramento Northern Railway		.54		Interurban
			.68	City
Southern Pacific Co.			18.77	City
	2.05			Interurban
Colorado				
Denver and Intermountain R.R.			.06	Interurban
Denver & Interurban R.R.			45.63	Interurban
Denver Tramway			.33	City
			.19	Interurban
Fort Collins Municipal Ry.			.19	City
Southern Colorado Ry.			.58	City
Connecticut				
Connecticut Co.		4.15	5.68	City
		16.23	23.72	Interurban
New Haven & Shore Line Ry.	9.25			Interurban
Waterbury & Milldale Tramway	3.00	3.00		Interurban
Delaware				
Delaware Elec. Pwr. Co.			.97	City
			2.18	Interurban
Dist. of Columbia				
Capital Traction Co.	1.03	1.03		City
Washington Ry. & Electric Co.	2.60			City
			2.94	Interurban
Florida				
Jacksonville Traction Co.			.17	City
Miami Beach Ry.	6.10			City
St. Augustine Co.	.39			City
Georgia				
Georgia Pwr. Co.			.50	City
Macon Ry. & Light Co.	.88	.88	.88	City
Savannah Elec. & Pwr. Co.			.59	City
Idaho				
Boise Valley Traction Co.	4.00			City
Illinois				
Central Illinois Public Service Co.	1.19			City
Illinois Power & Lt. Corp.	28.42			City
Indiana				
Indiana Service Corp.	18.97	18.97	18.20	Interurban
Indianapolis Street Ry.		.39	.11	City
Iowa				
Clinton Street Ry.	2.00			City
Iowa Southern Utilities Co.	3.75			City
Tri City Ry. of Iowa	1.10			City
Kansas				
Kansas City, Lawrence & Topeka Elec. R.R.	12.00		5.00	Interurban
Kansas City, Leavenworth & Western Ry.	2.07			City
	2.76			Interurban
Kansas City Pub. Service Co.	.65		.40	City
Kansas Elec. Pwr. Co.	1.50			City
Joplin & Pittsburg Ry.	9.30			Interurban
Kentucky				
Kentucky Utilities Co.	2.45		2.45	City
Louisville Ry.		1.65		City
Louisiana				
Louisiana Elec. Co.	7.55		2.65	City
New Orleans Pub. Service, Inc.	4.12		.83	City
Maine				
York Utilities Co.	31.50			Interurban
Maryland				
Cumberland & Westernport Transit Co.	11.20			Interurban
Potomac Edison Co.		.43	.83	City
United Railways & Elec. Co.		.82	2.66	City
Massachusetts				
Berkshire St. Ry.			.61	Interurban
Boston Elevated Ry.	1.49	7.71	9.11	City
Eastern Mass. Street Ry.	1.96		1.31	City
	11.42		11.87	Interurban
Lowell & Fitchburg St. Ry.	2.50			Interurban
Middlesex & Boston St. Ry.	9.88	9.88	13.29	Interurban
Milford & Uxbridge St. Ry.	6.00			Interurban
Springfield Street Ry.	1.23		1.23	City
	48.15	.57	27.17	Interurban
Worcester Consolidated St. Ry.	2.50			City
	87.63			Interurban
Michigan				
Dept. of Street Ry., Detroit			1.81	City
Detroit United Ry.	14.93	14.93	.24	City
	63.44	63.44	14.21	Interurban
Grand Rapids, Grand Haven & Muskegon Ry.	1.00			City
Menominee & Marinette Light & Traction Co.	.59			Interurban
Michigan Elec. Ry.		1.98		Interurban
Michigan Gas Elec. Co.	4.50			Interurban
Minnesota				
Twin City Rapid Transit Co.	.92			Interubran
Mississippi				
Mississippi Pwr. & Light Co.	2.30		2.30	City
Missouri				
Kansas City Pub. Service Co.	0.65		0.40	City
Missouri Pwr. & Light Co.	2.00		2.00	Interurban
St. Francois County R.R.		2.32		Interurban
St. Louis Pub. Service Co.		.05		City
			.23	Interurban
Nebraska				
Lincoln Traction Co.	10.67	4.28	1.55	City
New Jersey				
Coast Cities Ry.	1.40			City
New York				
Auburn & Syracuse Elec. R.R.		13.72		City
Brooklyn City R.R.			.29	City
Brooklyn-Man. Transit Corp.			2.29	City
Eastern N. Y. Utilities Corp.	2.00			City
Empire State R.R.		10.82		City
Hudson Valley Ry.	12.92	19.92		Interurban
International Ry.	2.81		.22	City
			1.46	Interurban
Jamestown Street Ry.			2.30	City
			2.60	Interurban
N. Y. & Stamford Ry. Co.	35.96	35.96		Interurban
Olean, Bradford & Salamanca Ry.	15.00	15.00		City
	70.00	70.00		Interurban
Staten Island Midland Ry.	18.79			City
Third Ave. Ry.			.22	City
Uuited Traction Co.		3.64	2.47	City
North Carolina				
Durham Pub. Serv. Co.	.21			City
Southern Pub. Utilities Co.		.50		City
North Dakota				
Northern States Pwr. Co.			1.33	City
Ohio				
Cleveland Ry.			.32	City
Community Traction Co.	3.41		3.23	City
Northern Ohio Pwr. & Light Co.		3.56	3.56	City
		.29	.29	Interurban
Ohio Public Service Co.	2.40			City
Pennsylvania-Ohio Elec. Co.		3.30		Interurban
Springfield Ry.		.25		City
Oklahoma				
Northeast Oklahoma R.R.			.47	Interurban
Oregon				
Portland Electric Pwr. Co.	12.90			Interurban
Portland & Troutdale Elec. Ry.	1.50		1.50	Interurban
Pennsylvania				
Erie Ry.	.78		3.79	City
Harrisburg Ry.	1.00			City
Indiana County Street Rys.		9.00	9.00	Interurban
Lehigh Valley Transit Co.	4.21			City
Philadelphia Rapid Transit Co.	1.13		4.90	City
Pittsburgh Rys.			4.59	City
Reading Transit Co.		1.33	.70	City
		9.42		Interruban
Shamokin & Edgewood Elec. Ry.		2.00		Interurban
Shamokin & Mt. Carmel Transit Co.	2.30			Interurban
Westchester Street Ry.		.75		City
	3.00			Interurban
West Penn Rys.	3.92			Interurban
Rhode Island				
Newport Elec. Corp.		4.50		City
		22.00		Interurban
United Elec. Rys.		1.84		City
		23.57	.77	Interurban
Tennessee				
Memphis Street Ry.		1.17	.16	City
Texas				
Dallas Ry. & Terminal Co.	.81			City
El Paso Elec. Co.	.50			City
Houston Elec. Co.		1.80		City
Texas Elec. Ry.	3.00			City
Utah				
Utah-Idaho-Central R.R.	2.50			City
Utah Light & Traction Co.	3.28	3.28	.75	City
	2.51	9.51	9.51	Intercity
Vermont				
Burlington Traction Co.	.50			Interurban
Vergennes Pwr. Co.		.80		City
Virginia				
Virginia Electric Pwr. Co.	21.06	.81	11.66	City
Washington				
Puget Sound Power & Light Co.	1.70			City
	1.37			Interurban
Seattle Municipal Street Ry.	2.79			City
West Virginia				
Monogahela West Penn Pub. Service Co.			1.10	City
Princeton Pwr. Co.	.25			City
Wheeling Traction Co.		2.28		City
	.25			Interurban
Wisconsin				
Milwaukee Elec. Ry. & Light Co.	.14			City
	.28		1.86	Interurban
Wisconsin Pwr. & Light Co.	38.85	1.70	1.70	Interurban
Wisconsin Pub. Service Corp.	2.50			City
	8.31			Interurban
Canada				
British Columbia Elec. Ry.	1.28			City
Hydro Elec. Rys.	7.64			City
Montreal & Southern Counties Ry.	1.08			City
Montreal Tramways Co.	4.91		3.54	City
	16.19			Interurban
Niagara, St. Catharines & Toronto Ry.		.24		Interurban
Winnipeg Elec. Co.		1.75		City
Total	772.68	432.19	313.05	

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a permanent terminal at Port Chester, at the Connecticut State line.

Electrification of steam railroad trackage totaled slightly more than 140 miles during the year just ended. Nine such projects were reported, the same number as the year before. Outstanding among these was the electrification of the Sea Beach branch of the Long Island Railroad. This company alone added more than 90 miles to its electrified trackage. Other electrification projects were comparatively small, but represent a substantial total.

Interchange of through freight traffic among the Long Island, the Pennsylvania and the New Haven Railroads, by means of electrically operated freight trains, commenced on July 8, when electric locomotives replaced steam locomotives in the movement of freight cars from Bay Ridge, Brooklyn, to Port Morris, in the Bronx, via the Bay Ridge division of the Long Island Railroad, and the Hell Gate Bridge Route of the New York Connecting Railroad.

This is the first step taken by the Long Island Railroad to electrify its freight lines in Greater New York. The estimated cost of electrifying the Bay Ridge division exceeds $4,000,000.

In conjunction with this electrification the New York Connecting Railroad electrified its freight tracks between Fresh Pond and Port Morris, known as the Hell Gate Bridge Route.

Another electrification project for which first steps were taken during the past year is that of the Boston, Revere Beach & Lynn Railroad, popularly known as the "Narrow Gage." The new management, recently installed, plans to electrify both the 12-mile double-track main line between Lynn and the East Boston Ferry terminal and the Winthrop loop line.

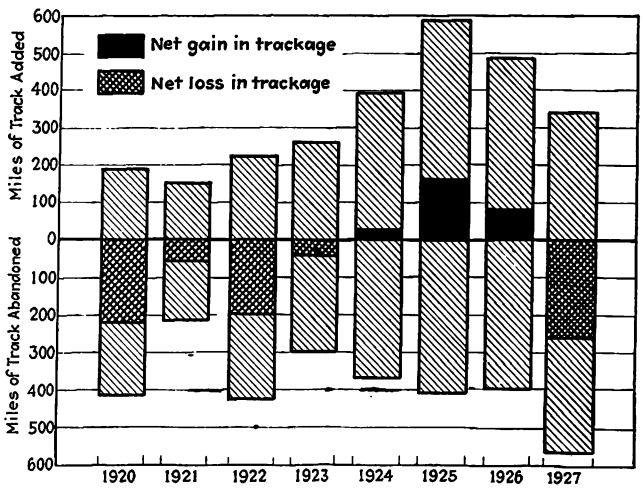
The 3-ft. gage will be retained on the entire system, totaling 34 miles of single track. The complete program will cost more than $1,000,000 and includes the purchase of new car equipment, remodeling of all stations, installation of an overhead system and the construction of substations.

Electric operation will provide not only a faster ride but also a cleaner ride. This feature will be appreciated particularly in the tunnels on the road, where the smoke from the steam locomotives has proved in the past a nuisance to the patrons and a problem to the owners.

In order to finance the proposed improvements the directors have recommended to the stockholders that they authorize immediate application to the Department of Public Utilities for authority to issue 1,700 additional shares of stock and $1,000,000 of general mortgage bonds of the company.

During the past year ten electric railways with a total trackage of approximately 160 miles abandoned all rail operation. Two of these installed bus service in place of car service. Bus service under different management replaced the transportation service formerly given by five of these railways. In the three remaining instances it appears that no service of any kind is now being given.

Car operation was replaced by bus operation on trackage totaling about 450 miles by electric railways which continued to operate the major parts of their systems. A total of approximately 600 miles of track was definitely abandoned. Extensions to bus routes to the extent of more than 3,000 miles were made by the electric railways and the combined track and bus mileage of the local transportation systems therefore showed a substantial gain for the year. Details of the additions to bus routes are given in an article published elsewhere in this issue.



Net gain or loss of trackage by years

Entire Abandonments in 1927

	Miles
Louisiana Electric Company, Lake Charles (*A*)	7.55
Shawnee-Tecumseh Traction Company (*A*)	9.51
Mesaba Railway (*B*)	38.00
New Bedford & Onset Street Railway (*B*)	21.24
Reno Traction Company (*B*)	7.50
Chicago & Interurban Traction Company (*B*)	41.00
Hoosick Falls Railroad (*B*)	7.55
Allen Street Railway (*C*)	5.42
Jefferson Traction Company (*C*)	18.00
Lewisburg & Ronceverte Electric Railway (*C*)	6.20
Total	161.97

(*A*) Complete substitution of buses under same management.
(*B*) Complete substitution of buses under new management.
(*C*) Complete abandonment—no service now given.

Looking back over the record of the electric railways during the past decade it is noteworthy that additions to the trackage of the industry have been considerably greater than the abandonments. A total of 4,060 miles of new track has been added, while the abandonments have amounted to only 3,800 miles. Of this latter figure 1,380 miles represent parts of railway systems where the bus has replaced the electric car. Nearly all of these abandonments were interurban or suburban track where traffic was extremely thin. In many instances it is extremely doubtful if there ever was any economic justification for its construction.

Substitution of buses under the same management over the entire system has occurred on 46 properties with 460 miles of track, or about 10 miles apiece. The majority of these railways were local lines in towns of less than 20,000 population. Complete abandonment and substitution of buses operated by other agencies has occurred on 1,180 miles of track. Included in this figure are a few medium-sized interurbans and a considerable number of small railways with less than 10 miles of track. Approximately 630 miles of track has been entirely abandoned and no service of any kind is now given. In this classification also the average size of the properties abandoned is less than 10 miles.

Summarizing the situation as it exists today, there has been a net gain of several hundred miles in the trackage of the electric railway industry since the beginning of 1917. During this period about 18,000 miles of bus route has been added. Thus the present total for track and bus together is approximately 64,000 miles, or nearly 50 per cent greater than the pre-war mileage of the local transportation industry.

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Passenger Car Purchases Low in 1927

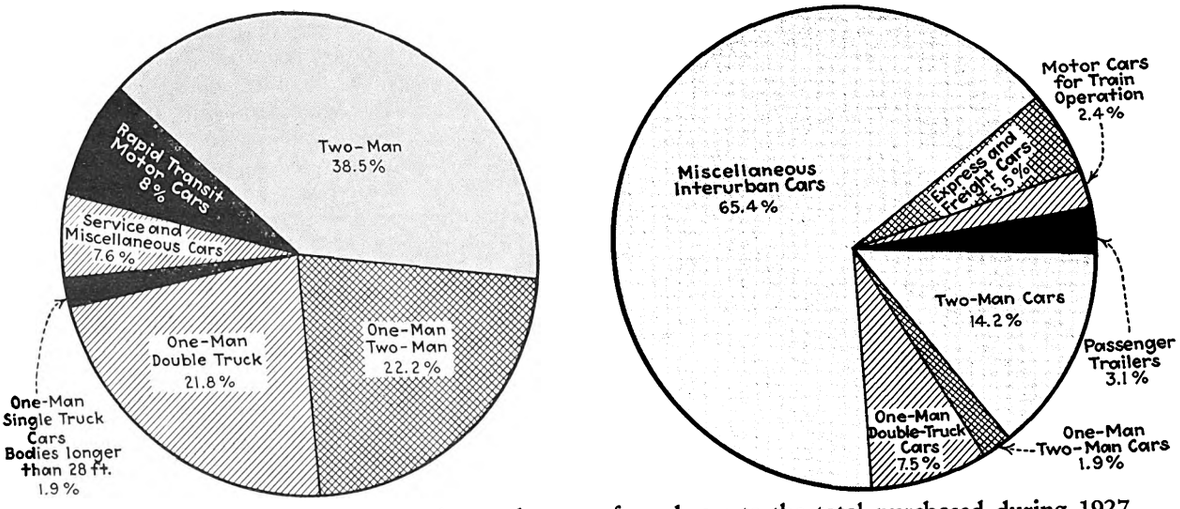
Table I—Number and Types of Cars Purchased During 1927

	U.S.	Extraterritorial	Canada	Total
Number of companies reporting purchases of new cars	53	2	6	61
CITY SERVICE				
One-man cars, 28 ft. body	...	...	...	...
One-man cars with bodies longer than 28 ft.:				
Single truck	16	..	1	17
Double truck	191	..	4	195
One-man, two-man cars	170	8	20	198
Two-man cars (surface)	252	6	86	344
Motor cars for rapid transit lines	70	..	...	70
Trailers	...	..	...	...
Service and miscellaneous cars.	68	..	...	68
Total cars for city service	767	14	111	892
INTERURBAN SERVICE				
One-man, single-truck cars	...	..	...	...
One-man, double-truck cars	31	..	...	31
One-man, two-man cars	8	..	...	8
Two-man cars	59	..	...	59
Passenger trailers	13	..	...	13
Motor cars for train service	10	..	...	10
Express and freight cars	23	..	...	23
Miscellaneous cars	271	..	1	272
Total for interurban service.	415	..	1	416
Electric locomotives	38	1	1	40
Total cars and electric locomotives	1,220	15	113	1,348

Much attention was given during the year to experimental development of passenger cars and trucks. There were 824 city type passenger cars, 121 interurban passenger cars, 40 electric locomotives and 363 freight and miscellaneous cars ordered during 1927. This is a low volume for new electric railway rolling stock

ORDERS for a total of 1,348 cars and electric locomotives were placed during 1927. Except for the year 1921, when only 1,276 cars and electric locomotives were bought, the number for 1927 is the lowest for any year since 1907, when ELECTRIC RAILWAY JOURNAL began first to compile these statistics. The buying was confined to a comparatively few railways, there being only 61 properties that reported purchases of new rolling stock. These are divided 53 in the United States, two extraterritorial and six in Canada.

There were seventeen railways that purchased twenty or more passenger cars. These seventeen railways account for nearly 72 per cent of the total passenger car orders. The number of railways is the same as for 1925, but a decrease of five from 1926, when 22 railways reported purchases of twenty or more cars. The largest order during 1927 was that of the Department of Street Railways for the city of Detroit, which purchased 125 double-truck two-man cars for city service. The work of building these cars was divided among three car plants. The Springfield Street Railway, Springfield, Mass., bought 51 double-truck one-man cars and the St. Louis Public Service Company built the same number of double-truck, two-man cars. Four railways purchased 50 passenger cars. The Eastern Massachusetts Street Railway and the Worcester Consolidated Street Railway each bought 50 double-truck one-man, two-man cars; the Montreal Tramways 50 double-truck two-man cars and the New York Rapid Transit Corporation 50 triplex units for subway service and one supply car. These triplex units consist of three car bodies mounted on four trucks. The end bodies are each 47 ft. 11⅛ in. long and the center section is 41 ft. 1¾ in. long. The combined length is 137 ft. 3 in. over all and seats are provided for 160 passengers. Companies purchasing twenty or more cars are listed in Table III.



Diagrams showing the proportion that each type of car bears to the total purchased during 1927
At left, city cars; at right, interurban cars.

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Table II—Special Comparison of New Rolling Stock Ordered by Years

	1927	1926	1925	1924	1923	1922	1921	1920	1919	1918	1917	1916
Number of railways reporting new cars	61	108	94	119	167	145	94	172	160	140	182	250
CITY SERVICE												
Number of one-man cars (28-ft. body S. T.)	....	66	55	103	312	772	565	1,699	1,383	644	280	187
Number of one-man cars other than 28-ft. body	212	144	74	96	183	227	....	....	....	....	....	....
Number of one-man, two-man cars	198	574	512	1,224	1,076	471	....	....	....	....	....	....
Number of two-man passenger motor cars*	414	456	405	537	1,097	1,290	383	847	635	1,068	1,316	2,731
Number of passenger trailers	....	9	8	25	247	150	111	343	111	130	402	128
Service cars	68	52	70	44	121	103	47	104	31	(a)	(a)	(a)
Total cars city service	892	1,301	1,124	2,029	3,036	3,015	1,106	2,993	2,160	1,842	1,998	3,046
INTERURBAN SERVICE												
Number of one-man cars	31	43	3	61	56	40	....	....	....	....	....	....
Number of one-man, two-man cars	8	45	70	38	38	9	....	....	....	....	....	....
Number of two-man motor cars*	69	172	207	435	330	122	103	195	96	200	158	303
Number of passenger trailers	13	49	40	4	3	16	26	32	32	55	27	71
Number of freight, express and miscellaneous cars	295	212	168	1,494	474	302	34	361	141	(a)	(a)	(a)
Total cars interurban service	416	521	488	2,032	901	489	163	588	269	255	185	374
Total number of cars	1,308	1,822	1,612	4,061	3,937	3,538	1,269	3,581	2,429	2,375	2,406	3,911
Number of electric locomotives	40	60	47	31	92	34	7	17	18	44	49	31

*Includes motor and trail cars for subway, elevated and train service. (a) Not available.

The statistics of new rolling stock given in the tables and charts herewith when analyzed in detail show decreases for all types except one-man double-truck passenger cars for city service, two-man cars for city operation and service, freight, express and miscellaneous cars. There were 363 cars in the latter class, divided 68 service and miscellaneous cars for city service, 23 express and freight cars and 272 miscellaneous cars for interurban service. The total of these classes for 1926 was 264 cars, so there is an increase of 99 cars for 1927. This increase is due to an order for 250 dump cars and ten flat cars placed by the Illinois Traction, Inc.

Interest naturally centers in passenger car purchases. Comparison of the years 1925, 1926 and 1927 shows a total of 945 passenger cars ordered during 1927, as compared with 1,558 in 1926 and 1,374 in 1925. There were 754 city surface passenger cars bought in 1927, as compared with 932 in 1926; 70 rapid transit motor cars purchased in 1927, as compared with 317 in 1926, and 121 interurban passenger cars bought during 1927, as compared with 309 in 1926. The only classes of passenger cars that show an increase for 1927 over 1926 are double-truck one-man cars for city service and two-man cars for city service, there being 195 double-truck one-man cars purchased in 1927, as compared with 121 for 1926, and 344 two-man city cars bought in 1927, as compared with 139 in 1926. Comparative numbers of the various types of cars purchased during the last twelve years are given in Table II.

Special comparisons of new cars purchased during 1927 are given at the beginning of this article in Table I and the diagrams on page 56 show at a glance just what types of cars are being bought in greatest proportion. Of cars purchased for city service 344, or nearly 39 per cent, are of the two-man type. The number of double-truck one-man cars and one-man, two-man cars are nearly the same, there being 195 of the former and 198 of the latter. The number of each type constitutes approximately 22 per cent of the total cars for city service. These three types of city passenger cars constitute 82.5 per cent of the total, the remainder being made up of seventeen single-truck one-man cars, 70 motor cars for rapid transit lines and 68 miscellaneous cars.

Of the interurban cars, miscellaneous service cars constitute more than 65 per cent of the total. The two-man type for interurban passenger service predominated, there being 59 of these bought, or slightly more than 14 per cent of the total. There were purchased 31 one-man interurban cars, 7.5 per cent of the total; 23 express and freight cars, 5.5 per cent; thirteen passenger trailers, 3.1 per cent, and ten motor cars for train operation, 2.4 per cent. Of the cars reported for interurban service, eight,

Table III—Railways Purchasing 20 or More Passenger Cars

Department of Street Railways, Detroit	125 City, double-truck, 2 man
Springfield Street Railway	51 City, double-truck, 1 man
St. Louis Public Service Company	51 City, double-truck, 2 man
Eastern Massachusetts Street Railway	50 City, double-truck, 1-2 man
Montreal Tramways	50 City, double-truck, 2 man
New York Rapid Transit Corporation	50 Triplex units, 3 bodies on 4 trucks 1 Supply car
Worcester Consolidated Street Railway	50 City, double-truck, 1-2 man
Georgia Power Company	40 City, double-truck, 1 man
Chicago, North Shore & Milwaukee Railroad	15 Interurban double-truck motor cars 10 City, double-truck, 1-2 man 2 Interurban dining cars 1 Interurban parlor car 10 Freight trailers
Dominion Power and Transmission Company	36 City, double-truck, 2 man
Market Street Railway	26 City, double-truck, 2 man
Twin City Rapid Transit Company	25 City, double-truck, 1-2 man
Chicago, South Shore & South Bend Railroad	10 Interurban double-truck motor cars 10 Interurban double-truck trailers 5 Cabooses
Houston Electric Company	20 City, double-truck, 1 man
Hudson & Manhattan Railroad	20 Rapid transit motor cars
New Orleans Public Service, Inc.	20 City, double-truck, 2 man
Ottawa Electric Railway	20 City, double-truck, 1-2 man

Table IV—Electric Locomotives Ordered in 1927

Name of Railway	Number	Weight Tons	Length Over All Ft.	In.
Chicago, North Shore & Milwaukee R.R.	2	65	40	0
Chicago, South Shore & South Bend R.R.	2	80	39	0
	2	50	35	6
Cincinnati, Hamilton & Dayton Ry.	1	51	50	0
Great Northern Ry.	2	205	73	9
Hershey Cuban Ry. (Cuba)	1	60	37	4
Houston, North Shore Ry.	1	50	35	6
Long Island R.R.	15	160	64	11
	2	25	13	6
	1	100	45	10
	1	80	40	0
Montreal & Southern Counties Ry.	1	60	36	0
New York, New Haven & Hartford R.R.	5	170	68	6
New York State Rys.	1	50	37	4
Sacramento Northern Ry.	2	60	....	
Terre Haute, Indianapolis & Eastern Traction Co.	1	45	35	6
Total	40			

Table V—New Rolling Stock Ordered Since 1907

Year	Passenger Cars—City	Passenger Cars—Interurban	Freight and Miscellaneous Cars	Electric Locomotives	Total
1907	3,483	1,327	1,406	(a)	6,216
1908	2,208	727	176	(a)	3,111
1909	2,537	1,245	1,175	(a)	4,957
1910	3,571	990	820	(a)	5,381
1911	2,884	626	505	(a)	4,015
1912	4,531	783	687	(a)	6,001
1913	3,820	547	1,147	(a)	5,514
1914	2,147	384	479	(a)	3,010
1915	2,072	336	374	(a)	2,782
1916	3,046	374	491	31	3,942
1917	1,998	185	223	49	2,455
1918	1,842	255	278	44	2,419
1919	2,129	128	172	18	2,447
1920	2,889	227	465	17	3,598
1921	1,059	129	81	7	1,276
1922	2,912	187	405	34	3,538
1923	2,915	427	595	92	4,029
1924	1,985	538	1,538	31	4,092
1925	1,054	320	238	47	1,659
1926	1,249	309	264	60	1,882
1927	824	121	363	40	1,348

(a) Included in "Freight and Miscellaneous Cars."

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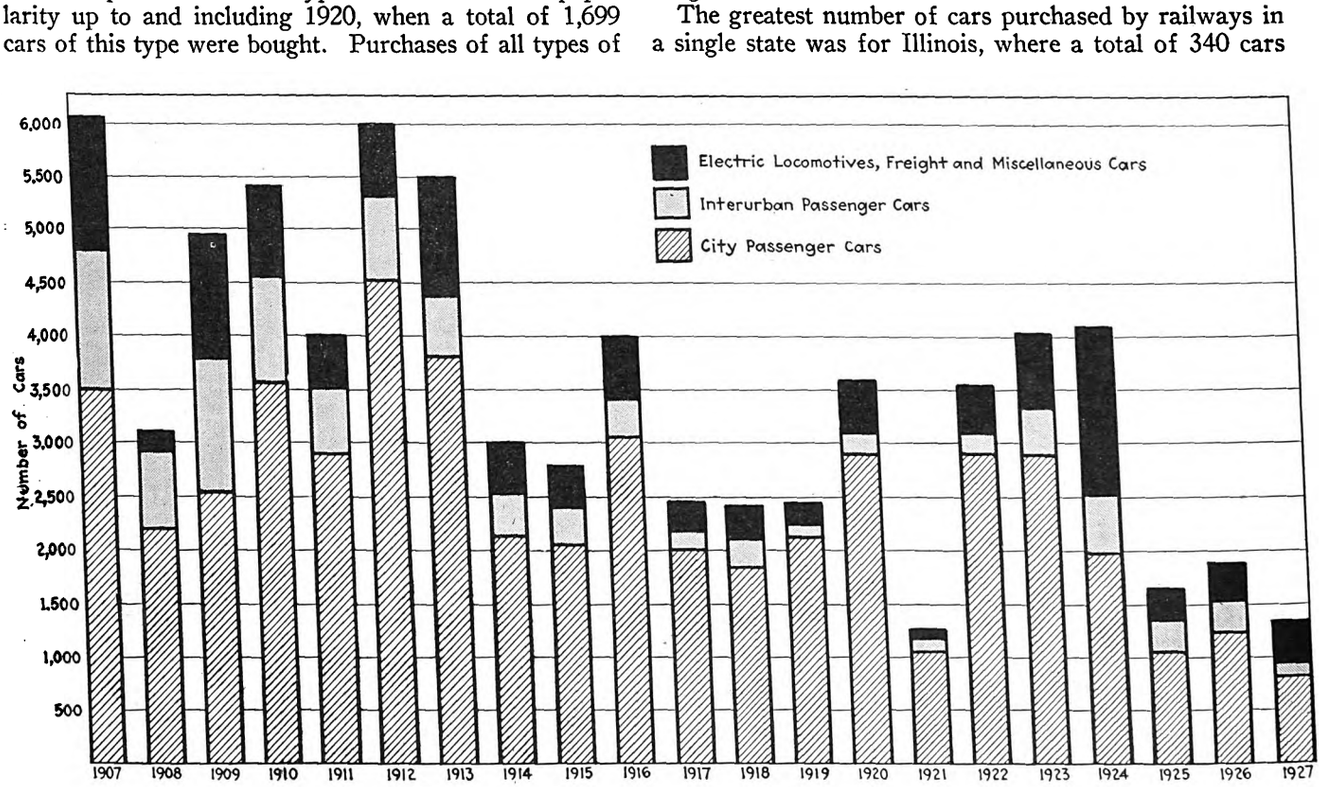
or about 2 per cent of the total, were classified as one-man two-man type.

The trend toward one-man operation, which was introduced with the Birney safety car and later through the purchase of double truck one-man cars and one-man, two-man cars, is shown in the chart on page 59. One-man single-truck cars with 28-ft. bodies, the original safety cars, made their first appearance in 1916, when 187 were purchased. This type of car increased in popularity up to and including 1920, when a total of 1,699 cars of this type were bought. Purchases of all types of adopted this year will make it more convenient to locate a particular electric railway for detailed information than with the other arrangement. Reports from railways in the Dominion of Canada and districts outside continental United States are grouped separately. In addition to listing the number of cars ordered by the individual companies, the table shows the class of car and type of service. It also gives data as to length, seating capacity, weight and number of motors for the cars.

The greatest number of cars purchased by railways in a single state was for Illinois, where a total of 340 cars



Graphical analysis of city cars, interurban cars and total cars and electric locomotives purchased during the past 21 years

cars in 1921 took a decided drop and the number of single-truck one-man cars purchased in that year was but 565. However, they constituted nearly 60 per cent of the total motor cars purchased for city service during that year. During the year 1922 there was a reaction away from the use of single-truck cars and double-truck one-man and one-man, two-man cars made their first appearance. There were 772 single-truck one-man cars with 28-ft. bodies, 227 one-man cars with bodies longer than 28 ft. and 471 one-man, two-man cars purchased in 1922. Since that time the number of single-truck one-man cars bought each year has decreased and their place has apparently been taken by one-man and one-man, two-man double-truck cars. The greatest number of one-man, two-man cars was purchased during the year 1924, when a total of 1,224 were reported. Since then purchases of all types of cars have fallen off. Of the motor-passenger cars purchased for city service during 1927, 45.6 per cent were two-man cars, 26.3 per cent were classified as one-man, two-man cars, 25.8 per cent one-man double-truck cars, 2.3 per cent one-man single-truck cars.

Details of rolling stock ordered by individual companies are given in Table IX. In this table the railways are arranged alphabetically for each state and the states in turn are arranged alphabetically. This arrangement is somewhat different than the method followed in previous years of grouping the states according to geographical divisions. It is believed, however, that the grouping were purchased. Of these, however, 260 were miscellaneous dump and flat cars for interurban service. The largest purchases of passenger cars were in the state of Massachusetts, there being a total of 161 passenger cars for city service reported. The total of all types of cars for the state was 194. The state of Michigan was brought into third place in the number of car purchases by the order of 125 cars by the Department of Street Railways for the city of Detroit. The total number of new cars reported by railroads in Michigan was 136. New York State is in fourth place, with a total of 93 new cars reported. Pennsylvania and Ohio, which in previous years have been leaders in the number of cars purchased, were far behind during 1927, there being but 34 cars reported by railways in Pennsylvania and but fifteen for the railways in Ohio.

For convenience in comparing rolling stock purchases during the past 21 years, and to show at a glance the number of cars purchased as divided between city and interurban passenger cars and freight, express service and miscellaneous cars, Table V has been prepared. This gives the total number of cars ordered each year beginning with 1907. Rolling stock purchases are divided into four classes: First, city passenger cars; second, interurban passenger cars; third, freight, express and miscellaneous cars, and, fourth, electric locomotives. In this classification cars for electrified steam railroad suburban service are included with interurban cars. The miscel-

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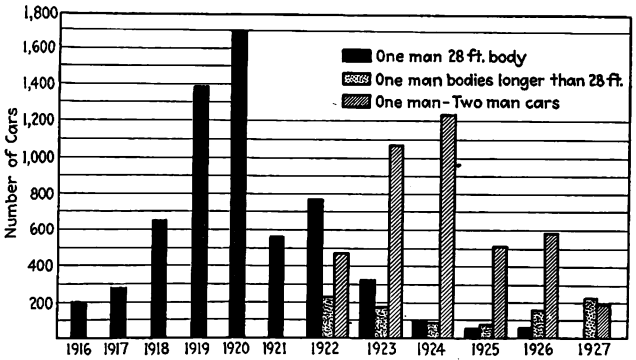
laneous cars include service cars, snow plows, sweepers, work cars, etc.

In addition to this table, the trend of purchases is shown by diagrams. The total rolling stock purchased for each year is divided into city passenger cars, interurban passenger cars and miscellaneous express, freight, service and electric locomotives. High points of purchases are shown by the chart for the years up to and including 1913, again for 1916, 1920, and for the years 1922, 1923 and 1924.

A special comparison of cars ordered during the last twelve years is given in Table II. Cars are listed separately for city and interurban service and each class divides the various cars according to type. It is interesting to note how the number of single-truck cars purchased yearly increased up to 1920. Since then the swing in car purchases has been toward the use of longer bodies with double trucks. The trend for each class of car has been discussed in connection with each individual classification.

Purchases of electric locomotives during 1927 are listed in Table IV. The total number of electric locomotives bought is 40, as compared with 60 for 1926 and 47 for 1925. The Long Island Railroad was the largest purchaser with fifteen 160-ton, one 100-ton, one 80-ton and two 25-ton locomotives. The New York, New Haven & Hartford Railroad purchased five 170-ton locomotives, and the remaining sixteen locomotives purchased during 1927 are divided among ten electric railways.

The last column of Table IX shows the number of cars junked during the year. During 1927 a total of 1,597 cars were reported by electric railways as being junked. By grouping these into classes it is found that they consisted of 1,374 city passenger cars, 81 interurban passenger cars and 142 miscellaneous service, freight work and snow plows. There were 1,626 cars junked during 1926, and of these 1,402 were city passenger cars.



Relative purchases of one-man and one-man, two-man cars for the last twelve years

An accompanying diagram shows graphically the number of cars junked during the past six years. Comparison of the figures shown in this diagram indicates that the number of cars junked during 1927 exceeded those for the years 1922 and 1925. The greatest number of cars reported junked during any one year was in 1924, when a total of 1,853 cars were reported. New cars purchased for replacements during that year, however, were more than three times the number for 1927.

In analyzing the various one-man, one-man, two-man and two-man cars ordered for city service during 1927 it is found that they run quite uniform in length, weight and seating capacity. Detailed figures are given in Tables VI, VII and VIII. The length of the one-man double-truck cars ordered for city service varies from 39 ft. 11 in. to 46 ft. 4 in. The weighted average length for all cars of this type is 43 ft. 8 in.

Weights of this class of cars vary from 12 tons to 20.1 tons. The 12-ton car is the Chicago & Joliet car with aluminum body. The Springfield car with worm drive is reported as weighing 12.65 tons. Aside from these two cars the minimum weight is 14.7 tons. The weighted average for all cars of the one-man double-truck type is 17.7 tons. Seating capacities of one-man double-truck cars ordered for city service vary from 36 to 54, with a weighted average of 47 seats.

Cars reported as of the one-man, two-man type are of the same average size as one-man cars. Weights are just a little greater. Lengths vary from 40 ft. 8 in. to 51 ft. and the weighted average length for all cars of this type ordered in 1927 is the same as for one-man cars, namely, 43 ft. 8 in. Weights of one-man, two-man cars varied from 14 tons to 20 tons, with a weighted average for all cars of this class of 18 tons. Seating capacities varied from 44 to 56 and the weighted average was 47 seats, the same as for the one-man class.

Table VI—Dimensions of One-Man Double-Truck City Cars Built in 1927

Railway	No. Cars Ordered	Length, Ft. In.	Weight, Tons	Number Seats
Washington Railway & Electric Co.	12	42— 3	20.10	49
Georgia Power Co.	40	46— 4	18.90	48
Macon Railway & Light Co.	12	42—10	15.00	40
Chicago & Joliet Electric Ry.	1	41— 0	12.00	50
Gary Rys.	9	44— 0	18.50	52
Springfield Street Ry.	50	40— 8	18.25	45
Springfield Street Ry.	1	40— 8	12.65	44
Detroit United Ry.	10	42—10	14.90	49
Butte Electric Ry.	3	44—10	16.00	44
Brill 1928 Model Car	1	40— 8	15.00	45
Pittsburg Rys.	2	45— 0	15.00	36
El Paso Electric Co.	7	39—11½	16.25	49
Galveston Electric Co.	4	45— 0	18.00	48
Houston Electric Co.	20	44—11½	18.00	57
Northern Texas Traction Co.	10	39—11	17.00	40
Milwaukee Electric Ry. & Light Co.	10	45— 0	17.88	54
Saskatoon Municipal Ry.	4	39—11	14.67	41
	196			
Maximum		46— 4	20.10	54
Minimum		39—11	12.00	36
Weighted average		43— 8	17.70	47

Table VII—Dimensions of One-Man, Two-Man City Cars Ordered in 1927

Railway	No. Cars Ordered	Length, Ft. In.	Weight, Tons	Number Seats
Chicago, North Shore & Milwaukee R.R.	10	51— 0	20.00	56
East St. Louis & Suburban Ry.	5	46— 7	17.00	48
Boston Elevated Ry.	10	45— 0	15.75	48
Eastern Massachusetts Street Ry.	50	43—11	19.45	44
Worcester Consolidated Street Ry.	50	40— 8	17.65	44
Twin City Rapid Transit Co.	25	45— 6	14.00	50
Beaver Valley Traction Co.	8	44— 4	18.50	50
Knoxville Power & Light Co.	12	43— 2	19.00	48
Honolulu Rapid Transit Co.	8	42— 9	16.00	48
Ottawa Electric Ry.	20	45— 0	19.25	47
	198			
Maximum		51— 0	20.00	56
Minimum		40— 8	14.00	44
Weighted average		43— 8	18.00	47

Table VIII—Dimensions of Two-Man City Cars Ordered in 1927

Railway	No. Cars Ordered	Length, Ft. In.	Weight, Tons	Number Seats
Market Street Ry.	26	47— 0	19.00	50
Municipal Railway of San Francisco.	10	47— 1	25.50	50
Chicago & West Towns Ry.	14	45— 0	17.50	48
Interstate Public Service Co.	6	45— 6	20.00	52
New Orleans Public Service, Inc.	20	48— 2	19.50	52
Department of Street Railways, Detroit.	125	48— 5½	18.37	52
St. Louis Public Service Co.	50	50— 8	20.60	60
St. Louis Public Service Co.	1	50— 8	16.00	60
Porto Rico Ry., Light & Power Co.	6	45—11	15.00	57
Dominion Power & Transmission Co.	36	40—11	18.50	48
Montreal Tramways.	50	46— 2	16.00	42
	344			
Maximum		50— 8	25.50	60
Minimum		40—11	15.00	42
Weighted average		47— 6	18.61	48

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Table IX—Details of Rolling Stock Ordered During 1927

Name of Company	No.	Class	City or Interurban	Motor or Trailer	Single or Double Truck	Length Over All Ft. In.	Total Wt. Light Tons	No. Motors	Seating Capacity	One or Two Man	No. Cars Junked During Year
Alabama											
Alabama Power Co.											14 CM
Birmingham Electric Co.											10 CDT 13 CDM
Mobile Light & R.R. Co.											1 CDM
Arkansas											
Southwestern Gas & Electric Co.											1 CSM
California											
Bakersfield & Kern Electric Ry.											3 CDM 2 CSM
Key System Transit Co.											23 CM 1 CS
Market Street Ry.	26	Passenger	City	Motor	Double	47—10	19.00	4	50	Two	21 CDM
Municipal Ry. of San Francisco	10	Passenger	City	Motor	Double	47— 1	25.50	4	50	Two	
Pacific Electric Ry.											24 IM 16 IS 28 IF
Southern Pacific Co.											7 CDM 5 CSM
Colorado											
Colorado Springs & Interurban Ry.											3 CDM
Denver & Interurban R.R.											8 IM 5 IT
District of Columbia											
Washington Railway & Electric Co.	12	Passenger	City	Motor	Double	42— 3	20.10	4	49	One	40 CDM 1 CS
Georgia											
Georgia Power Co.	40	Passenger	City	Motor	Double	46— 4	18.90	4	48	One	
Macon Railway & Light Co.	12	Passenger	City	Motor	Double	42—10	15.00	4	40	One	
Illinois											
Aurora, Elgin & Fox River Electric Co.											31 CSM 9 CDM 1 IDM
Chicago, Aurora & Elgin R.R.	15	Passenger	Interurban	Motor	Double	55— 3½	56.00	4	54	One	
Chicago & Joliet Electric Ry.	1	Passenger	City	Motor	Double	41— 0	12.00	4	50	One	
Chicago, North Shore & Milwaukee R.R.	15	Passenger	Interurban	Motor	Double	55— 3½	51.00	4	52	Two	1 IDM
	10	Passenger	City	Motor	Double	51— 0	20.00	4	56	Both	5 IDOT
	2	Dining	Interurban	Trailer	Double	55— 3½	42.50	.....	24	Train	
	1	Parlor	Interurban	Trailer	Double	55— 3½	40.00	.....	17	Train	
	10	Freight	Interurban	Trailer	Double	60— 0	25.00	.....	.....	.....	
Chicago & West Towns Ry.	14	Passenger	City	Motor	Double	45— 0	17.50	4	48	Two	
East St. Louis & Suburban Ry.	5	Passenger	City	Motor	Double	46— 7	17.00	4	48	Both	1 IDM
Illinois Power Co.											2 CSM 2 CSOM 2 CST
Illinois Power & Light Co.											30 CSM 4 CSO 4 CS
Illinois Traction, Inc.	250	Dump	Interurban	Trailer	Double	42—10	25.50	.....	.....	.....	
	10	Flat	Interurban	Trailer							
Rockford & Interurban Ry.	7	Passenger	Interurban	Motor	Double	45— 6	.....	4	52	One	
Indiana											
Chicago, South Shore & South Bend R.R.	10	Passenger	Interurban	Motor	Double	60— 0	65.00	4	48	Two	5 IM
	10	Passenger	Interurban	Trailer	Double	60— 0	48.50	.....	46	.....	1 IT
	5	Caboose	Interurban	Trailer	Double	30— 0	19.00	.....	.....	.....	8 F
Evansville & Ohio Valley Ry.											5 IDM
Gary Rys.	9	Passenger	City	Motor	Double	44— 0	18.50	4	52	One	9 CDM
	2	Passenger	Interurban	Motor	Double	44— 8½	20.00	4	46	Both	
Interstate Public Service Co.	6	Passenger	City	Motor	Double	45— 6	20.00	4	52	Two	
Union Traction Co.	10	Freight	Interurban	Trailer	Double	41— 1½	15.50	.....	.....	.....	
	3	Work	Interurban	Motor	Double	45— 0	35.00	4	.....	.....	
Iowa											
Des Moines City Ry.	2	Dump	City	Trailer	Double	37— 6	.....	.....	.....	.....	
Kansas											
Joplin & Pittsburg Ry.											11 CSM 2 IDM
Kansas City, Leavenworth & Western Ry.	4	Passenger	Interurban	Motor	Double	45— 6	17.50	4	52	One	6 CM
Louisiana											
Louisiana Electric Co.											10 CSM
Municipal Street Ry. (Monroe)											1 CSM
New Orleans Public Service, Inc.	20	Passenger	City	Motor	Double	48— 2	19.50	4	52	Two	
Shreveport Rys.											3 CSM
Maryland											
United Railways & Electric Co.											2 CSM 49 CDM
Massachusetts											
Boston Elevated Ry.	10	Passenger	City	Motor	Double	45— 0	15.75	4	48	Both	
	19	Snow plow	City	Motor	Double	46— 2¾	34.00	4	.....	.....	
	7	Dump	City	Motor	Double	40— 0	25.00	4	.....	.....	
Eastern Massachusetts Street Ry.	50	Passenger	City	Motor	Double	43—11	19.45	4	44	Both	67 CDM 13 CSM 11 SP 12 CS
Fitchburg & Leominster Street Ry.	6	Passenger	Interurban	Motor	Double	36—10	16.05	4	40	Both	
Springfield Street Ry.	50	Passenger	City	Motor	Double	40— 8	18.25	4	45	One	
	1	Passenger	City	Motor	Double	40— 8	12.65	4	44	One	
Union Street Ry. (New Bedford)	1	Snow plow	City	Motor	Double	43— 4½	20.87	4	.....	.....	
Worcester Consolidated Street Ry.	50	Passenger	City	Motor	Double	40— 8	17.65	4	44	Both	
Michigan											
Detroit United Ry.	10	Passenger	City	Motor	Double	42—10	14.90	4	49	One	
	1	Freight	Interurban	Trailer	Double	48— 8	21.43	.....	.....	.....	
Department of Street Rys. (Detroit)	125	Passenger	City	Motor	Double	48— 5¼	18.37	4	52	Two	4 CDM
Menominee & Marinette Light & Traction Co.											1 CSM
Michigan Electric Ry.											3 CM 11 IM

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Table IX—Details of Rolling Stock Ordered During 1927—(Continued)

Name of Company	No.	Class	City or Interurban	Motor or Trailer	Single or Double Truck	Length Over All Ft. In.	Total Wt. Light Tons	No. Motors	Seating Capacity	One or Two Man	No. Cars Junked During Year
Minnesota											
Duluth Street Ry.											
Twin City Rapid Transit Co.	25	Passenger	City	Motor	Double	45— 6	14.00	4	50	Both	1 CM
Missouri											
Kansas City, Leavenworth & Western Ry.	4	Passenger	Interurban	Motor	Double	45— 6		4	52	One	
Kansas City Public Service Co.	2	Dump	City	Motor	Double	40— 0	26.00	4			
	2	Dump	City	Motor	Double	30— 0	24.00	4			
	5	Dump	City	Trailer	Double	40— 0	16.00				
	2	Dump	City	Trailer	Doulbe	30— 0	16.45				
	1	Crane	City	Motor	Double	44— 0	37.00	4			
Missouri Power & Light Co.											5 CSM
St. Louis Public Service Co.	50	Passenger	City	Motor	Double	50— 8	20.60	4	60	Two	9 CM
	1	Passenger	City	Motor	Double	50— 8	16.00	4	60	Two	1 CT
Southwest Missouri R.R.	1	Passenger	Interurban	Motor	Double	40— 4		4	42	One	
Montana											
Butte Electric Ry.	3	Passenger	City	Motor	Double	44—10	16.00	4	44	One	
Nebraska											
Lincoln Traction Co.											15 CDM, 1 IE
New Jersey											
Coast Cities Ry.											19 CO
Public Service Ry.	10	Sweeper	City	Motor	Single						86 CM, 14 CS
New York											
Fonda, Johnstown & Gloversville R.R.	1	Sweeper	City	Motor	Double	41— 0	18.00	4			
Hudson & Manhattan R.R.	20	Passenger	City	Motor	Double	51— 0	37.00	2	44	Train	
Jamestown Street Ry.											1 CM
Long Island R.R.											6 IDM
New York Central R.R.	10	Passenger	Interurban	Motor	Double	69— 3	63.85	2	100	Train	
	1	Baggage	Interurban	Motor	Double	63— 5	63.50	2		Train	
New York Rys.											8 CDM
New York & Queens County Ry.											12 CSM
New York Rapid Transit Corp.	50‡	Passenger	City	Motor	‡Four	137— 0	103.60	4	160	Train	
	1	Supply	City	Motor	Double	48— 3	35.00	4			
New York, Westchester & Boston Ry.	10	Passenger	Interurban	Motor	Double	72— 6	63.45	2	80	Two	
Richmond Rys., Inc.											10 CO
Third Avenue Ry.											37 CSM
United Traction Co. (Albany)											9 CSM
North Carolina											
Carolina Power & Light Co.	6	Passenger	City	Motor	Single	32—10	7.00	2	40	One	6 CM, 1 CS
Tide Water Power Co.											1 CDM
North Dakota											
Fargo-Moorhead Street Ry.											8 COT
Ohio											
Cincinnati Street Ry.											190 CSM
Cleveland Ry.	8	Dump	City	Motor	Double	40— 0	25.00	4			5 CDM
	4	Dump	City	Trailer	Double	40— 0	17.00				
	1	Sweeper	City	Motor	Single	27— 0	10.00				
New Castle Electric Street Ry.											1 CM, 1 CS
Northern Ohio Power & Light Co.	2	Dump	City	Trailer	Double	40— 0	17.00				25 CM
Portsmouth Public Service Co.											1 CDM
Oklahoma											
Shawnee-Tecumseh Traction Co.											9 CSM, 1 IF, 1 CS
Pennsylvania											
Beaver Valley Traction Co.	8	Passenger	City	Motor	Double	44— 4	18.50	4	50	Both	8 CDM
Philadelphia Rapid Transit Co.											25 CDM, 1 IF, 10 SP
Philadelphia & Western Ry.	5	Passenger	Interurban	Motor	Double	50— 6	32.00	4	55	Two	
Pittsburgh Rys.	2	Passenger	City	Motor	Double	45— 0	15.00	4	36	One	
	15	Passenger	Interurban	Motor	Double	52—10	23.00	4	52	Two	
West Penn Rys.	1	Freight	Interurban	Motor	Double	50— 0	22.50	4			4 CSM
	2	Flat	Interurban	Trailer	Single	20— 0	14.00				
	1	Line	Interurban	Motor	Double	48— 8	21.00	4			
Rhode Island											
United Electric Rys. (Providence)											280 CM, 12 CS
South Carolina											
South Carolina Power Co.											22 CM
Tennessee											
Johnson City Traction Corp.											2 CM
Knoxville Power & Light Co.	12	Passenger	City	Motor	Double	43— 2	19.00	4	48	Both	
Memphis Street Ry.											48 CSM
Texas											
El Paso Electric Co.	7	Passenger	City	Motor	Double	39—11½	16.25	4	49	One	5 CSM
Galveston Electric Co.	4	Passenger	City	Motor	Double	45— 0	18.00	2	48	One	
Galveston-Houston Electric Ry.											1 IDM
Houston Electric Co.	20	Passenger	City	Motor	Double	44—11½	18.00	4	57	One	
Northern Texas Traction Co.	10	Passenger	City	Motor	Double	39—11	17.00	4	40	One	10 CSM
Utah											
Utah Light & Traction Co.											10 CDM
Vermont											
Burlington Traction Co.											4 CSM
Virginia											
Virginia Electric & Power Co.	10	Passenger	City	Motor	Single	29— 0	18.00	4	44	One	5 CSM
Washington											
Puget Sound Power & Light Co.											4 CM, 8 IF
Tacoma Municipal Belt Line											4 CSM

‡ Three section articulated units.

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Table IX—Details of Rolling Stock Ordered During 1927—(Concluded)

Name of Company	No.	Class	City or Interurban	Motor or Trailer	Single or Double Truck	Length Over All Ft. In.	Total Wt. Light Tons	No. Motors	Seating Capacity	One or Two Man	No. Cars Junked During Year
West Virginia											
Wheeling Traction Co.											4 CSM 1 IDM 1 IDS
Wisconsin											
Milwaukee Electric Ry. & Light Co.	10	Passenger	City	Motor	Double	45— 0	17.88	4	54	One	
	4	Passenger	Interurban	Motor	Double	53— 5	46.00	4	48	Two	
Wisconsin Power & Light Co.											5 CSM 1 IDM 3 CM 3 IM
Wisconsin Public Service Corp.											
Extraterritorial											
Hawaii											
Honolulu Rapid Transit Co.	8	Passenger	City	Motor	Double	42— 9	16.00	4	48	Both	
Porto Rico											
Porto Rico Ry., Light & Power Co.	6	Passenger	City	Motor	Double	45—11	15.00	4	57	Two	17 CDM
Dominion of Canada											
British Columbia											
British Columbia Electric Ry.	1	Port. Sub. Stn.	Interurban	Trailer	Double						10 IF
Ontario											
Dominion Power & Transmission Co.	36	Passenger	City	Motor	Double	40—11	18.50	4	48	Two	16 CSM 10 CM
Hydro-Electric Rys.											
International Transit Co.	1	Passenger	City	Motor	Single	33— 0		2	40	One	
Ottawa Electric Ry.	20	Passenger	City	Motor	Double	45— 0	19.25	4	47	Both	
Quebec											
Montreal Tramways Co.	50	Passenger	City	Motor	Double	46— 2	16.00	4	42	Two	23 CSM 3 CSM 1 CSM
Quebec Ry., Light, Heat & Power Co.											
Sherbrooke Ry. & Power Co.											
Saskatchewan											
Saskatoon Municipal Ry.	4	Passenger	City	Motor	Double	39—11	14.67	4	41	One	

ABBREVIATIONS FOR TYPES OF CARS JUNKED

C—City cars
CS—City, single truck
CD—City, double truck
CM—City, motor cars
CT—City, trailer
CO—City, open
COT—City, open, trailer
CSM—City, single truck, motor
CST—City, single truck, trailer
CDM—City, double truck, motor
CDT—City, double truck, trailer
CSO—City, single truck, open
CSOM—City, single truck, open, motor
SP—Snow plow
I—Interurban cars
IS—Interurban service cars
IE—Interurban, express
IF—Interurban, freight
IM—Interurban, motor
IT—Interurban, trailer
IDM—Interurban, double truck, motor
IDOT—Interurban, double truck, open trailer

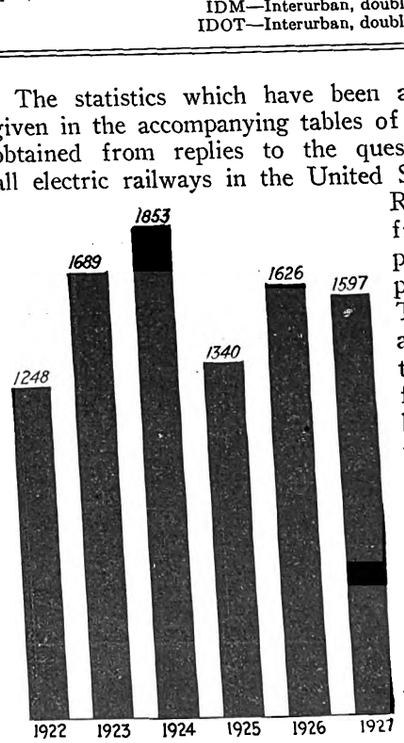
The two-man passenger cars ordered for city service in 1927 were larger than the two other types. Lengths of two-man city cars varied from 40 ft. 11 in. to 50 ft. 8 in. and the weighted average length for all cars of the class is 47 ft. 6 in. Weights of two-man city cars varied from 15 to 25½ tons and the weighted average is 18.6 tons. Seating capacities varied from 42 to 60 with an average of 48. The accompanying summary shows weighted averages for the three types of city passenger cars purchased in 1927 compared with average city cars purchased in 1926.

Average Double-Truck Passenger Cars Purchased for City Service in 1927

	Length	Weight, Tons	Seats
One-man double-truck	43 ft. 8 in.	17.7	47
One-man, two-man	43 ft. 8 in.	18.0	47
Two-man	47 ft. 6 in.	18.6	48
Average of city cars purchased in 1926	43 ft. 5 in.	17.36	44

In general design cars ordered during 1927 have been particularly distinctive and have shown a decided tendency toward de luxe appearance and accommodations. Never before in the history of the industry has so much attention been devoted to improving car appearance and the attractiveness of furnishings. The various car manufacturers have spent large sums of money in developing improved types of cars and trucks, and several have built experimental cars without orders. Trucks with worm and double reduction drive are being tried to permit the use of small high-speed motors and to reduce weight and noise. Particular attention has been given to increasing rates of acceleration and braking.

The statistics which have been assembled and are given in the accompanying tables of rolling stock were obtained from replies to the questionnaires sent to all electric railways in the United States and Canada. Replies were received from more than 90 per cent of all the properties addressed. Through the courtesy and co-operation of the various car manufacturers, lists of cars built by them during the year were furnished so that the replies received from railways could be checked very carefully. In a few cases where replies were not received from electric railways themselves the information furnished by the car manufacturers has been used. Replies were received from all car manufacturers. In addition to the information obtained from these two sources the files of ELECTRIC RAILWAY JOURNAL have been gone over carefully to check and verify figures. These include car orders contemplated as well as actually placed. Particular care has been used to verify figures which appeared doubtful.



Number of cars reported as junked during the last six years

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Expansion of Bus Operation

Continued During Past Year

Number of buses operated by electric railways increased nearly 20 per cent. Purchases of new equipment were slightly less than the year before. Bus route extensions made in 1927 total more than 3,000 miles

GROWTH of bus operation by the electric railways continued during 1927 at about the same rate as in the preceding year. The number of buses increased from 7,749 at the beginning of the year to 9,229 at its close. This was an expansion of approximately 20 per cent. The number of electric railways engaged in bus operation increased from 333 a year ago to 351 at the present time. Extensions of nearly 3,200 miles in the length of bus routes operated by the railways occurred during the past year, bringing the total to more than 18,000 miles. This increase was substantially larger than that of 1926, and represented a growth of slightly more than 20 per cent.

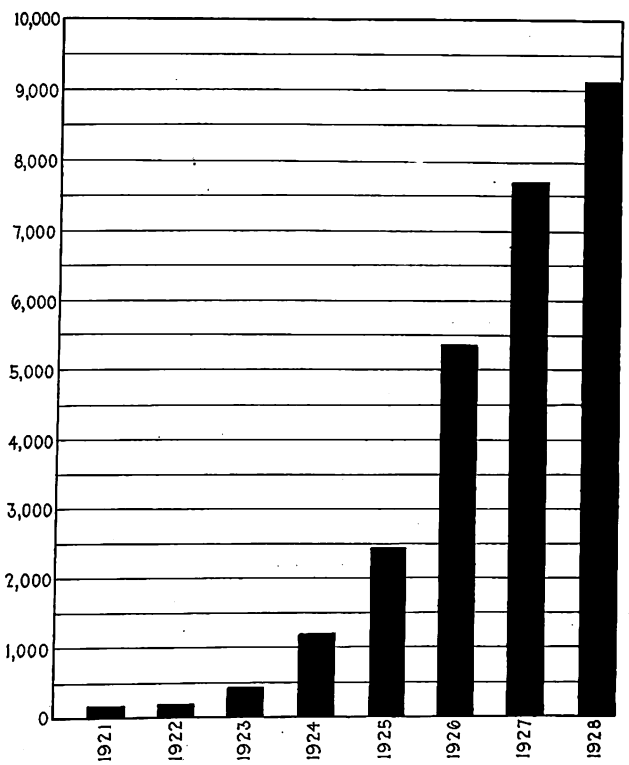
Buses purchased by the electric railways in 1927 totaled 1,801. Of this number about 95 per cent were bought new, while the remainder were second-hand vehicles acquired with the purchase of bus lines already in operation. In all, 147 electric railways reported the purchase of additional bus equipment last year. The number of railways making such purchases as well as the number of vehicles bought was slightly less than in 1926. A general tendency toward smaller and lighter vehicles was evident in the orders last year.

During the past year about 400 buses were scrapped compared with 160 scrapped in 1926. These figures included buses sold, traded in, converted to other uses and disposed of in various ways. While the net increase during the year in the number of buses operated is approximately equal to the difference between the number purchased and the number scrapped, exact calculations are impossible, because of the time which elapsed between the placing of orders for bus equipment and its actual delivery. For example, buses ordered in 1926 and delivered in 1927 appear on the record as an increase in the number of vehicles owned, although they are not included in the purchases for the year just ended.

The largest purchaser was the Public Service Railway of New Jersey and the affiliated Public Service Transportation Company, which bought a total of 316 buses during 1927. The next largest addition was that of 205 buses by the Philadelphia Rapid Transit Company. Other large purchasers include the Toronto Transportation Commission, 70; Cleveland Railway, 50; New York & Stamford Railway, 50; the associated Shore Line and Southwestern Michigan Motor Coach Companies, 43; the United Railways & Electric Company of Baltimore, 37; Monongahela West Penn Public Service Company, 37; International Railway, 33; Montreal Tramways, 31; Worcester Consolidated Street Railway, 30; Los Angeles Railway, 29; United Traction Company of Albany, 27; Virginia Electric & Power Company, 25; Illinois Power & Light Company, 24; Connecticut Company, 23, and the Pittsburgh Railways, 23.

Approximately 85 per cent of the buses bought last year were equipped with mechanical drive. The figures show that about 280 vehicles, or 15 per cent of the total, were equipped with gas-electric drive. This ratio is very nearly the same as that which prevailed in 1926.

De luxe and semi-de luxe buses were prominent among the purchases last year. A total of approximately 250 such vehicles was ordered. The largest purchaser of this type of equipment was the Philadelphia Rural Transit Company, subsidiary of the Philadelphia Rapid Transit Company. The Toronto Transportation Commission, which has been very successful in the operation of de luxe buses under the auspices of its subsidiary, the Gray Coach Lines, Ltd., bought 30 more vehicles of this type. The Pittsburgh Railways bought 23 de luxe buses for use in express service at a higher fare. Other large purchasers of de luxe bus equipment include the Shore Line Motor Coach Company, 21; Charleston Interurban Railway, 16; Wisconsin Power & Light Company, 13. In



Number of buses operated by electric railways

(*Continued on page 68*)

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Table I—Bus Operation by Electric Railways and Subsidiary Companies

	No. Bus Jan. 1, 1928
Alabama	
Birmingham Electric Co.	8
Selma Electric Ry.	5
Arizona	
Tucson Rapid Transit Co.	4
Arkansas	
Arkansas Power & Light Co.	10
Hot Springs Street Ry.	2
Intercity Terminal Ry.	7
California	
Bakersfield & Kern Electric Ry.	6
Eureka Street Ry.	1
Key System Transit Co.	48
Los Angeles Ry.	121
Los Angeles Motor Bus Co.	
Market Street Ry.	6
Municipal Ry. of San Francisco	19
Pacific Electric Ry.	170
Los Angeles Motor Bus Co.	
Pacific Gas & Electric Co.	6
Peninsular Ry.	4
San Diego Electric Ry.	20
San Francisco, Napa & Calistoga Ry.	2
Napa Valley Bus Co.	
San Francisco—Sacramento R. R.	1
San Jose Railroads	4
Santa Barbara & Suburban Ry.	9
Southern Pacific Co. (Electric Division)	59
Union Traction Co., Santa Cruz	5
Colorado	
Colorado Springs & Interurban Ry.	8
*Denver & Interurban Motor Co.	18
*Denver & South Platte Transportation Co.	2
Denver Tramway	4
Bus Transportation Co.	
Grand River Valley Ry.	4
Connecticut	
Connecticut Co.	124
*Danbury Power & Transportation Co.	16
Groton & Stonington Traction Co.	3
*Hartford & Springfield Coach Co.	22
*Lordship Ry.	6
New Haven & Shore Line Ry.	13
Delaware	
Delaware Electric Power Co.	48
Delaware Bus Co.	
Southern Pennsylvania Bus Co.	
District of Columbia	
Capital Traction Co.	31
Washington & Old Dominion Ry.	1
Washington Ry. & Electric Co.	71
Florida	
*Key West Electric Co.	10
Miami Beach Ry.	50
Municipal Ry. of St. Petersburg	8
Tampa Electric Co.	12
Georgia	
Augusta—Aiken Ry. & Electric Co.	1
Columbus Electric & Power Co.	22
Columbus Transportation Co.	
*Fairburn & Atlanta Ry. & Electric Co.	4
Georgia Power Co.	32
Atlanta Coach Co.	
Savannah Electric & Power Co.	4
Idaho	
*Boise Street Car Co.	4
Illinois	
Aurora, Elgin & Fox River Electric Co.	5
Central Illinois Public Service Co.	9
Chicago, Aurora & Elgin R.R.	2
Chicago & Joliet Electric Ry.	9
Chicago & Joliet Transportation Co.	
Chicago, North Shore & Milwaukee R.R.	47
Chicago Surface Lines	5
Chicago & West Towns Ry.	28
East St. Louis & Suburban Ry. East St. Louis Ry. Co. *Blue Goose Motor Coach Co.* *Red Line Motor Bus Co.*	43
Evanston Ry.	15
Evanston Bus Co.	
Illinois Power Co.	18
Illinois Power & Light Corp.	104
Illinois Traction System	22
*Joliet, Plainfield & Aurora Transportation Co.	5
Rockford City Traction Co.	27
Rockford & Interurban Ry.	6

	No. Bus Jan. 1, 1928
Indiana	
Chicago, South Bend & Northern Indiana Ry.	25
Railway Transit Lines	
Chicago, South Shore & South Bend R.R. Gary Railways *Shore Line Motor Coach Co.* *Southwestern Mich. Motor Coach Co.*	148
Evansville & Ohio Valley Ry.	2
Indianapolis & Cincinnati Traction Co.	4
Indianapolis Street Ry.	33
Indiana Service Corp.	25
Interstate Public Service Co.	43
Northern Indiana Power Co.	2
Southern Indiana Gas & Electric Co.	10
Terre Haute, Indianapolis & Eastern Trac. Co.	38
Indiana Motor Transit Co.	
Terre Haute Traction & Light Co.	16
Union Traction Co. of Indiana	40
Iowa	
Cedar Rapids & Iowa City Ry.	7
Des Moines & Central Iowa R.R.	3
Des Moines City Ry.	6
Des Moines Electric Light Co.	6
Fort Dodge, Des Moines & Southern R.R.	32
Fort Dodge, Des Moines & Southern Transportation Co.	
Interstate Power Co.	7
Iowa Railway & Light Co.	2
Iowa Southern Utilities Co	
(Burlington)	16
(Centerville)	3
(Ottumwa)	6
Mississippi Valley Electric Co.	3
Waterloo, Cedar Falls & Northern Ry.	8
Tri-City Ry.	12
Kansas	
Arkansas Valley Interurban Ry.	12
Arkansas Valley Transportation Co.	
Kansas City, Leavenworth & Western Ry.	13
Leavenworth Transportation Co.	
Kansas Electric Power Co.	9
Kansas Public Service Co.	2
*Salina Street Ry.	1
Topeka Ry.	29
United Power & Light Corp.	1
Wichita Railroad & Light Co.	13
Kentucky	
Kentucky Traction & Terminal Co.	21
Kentucky Coach Co.	
Kentucky Utilities Co. (Paducah)	10
Louisville Ry.	23
Kentucky Carriers, Inc.	
Louisiana	
*Alexandria Municipal Railway	12
Baton Rouge Electric Co.	3
*Louisiana Elec. Co.	9
New Orleans Public Service, Inc.	30
Maine	
York Utilities Co.	8
Maryland	
Cumberland & Westernport Electric Ry.	9
Cumberland & Westernport Transit Co.	
Potomac Edison Co.	61
Blue Ridge Transportation Co.	
United Rys. & Electric Co.	112
Baltimore Coach Co.	
East Fayette Street Bus Co.	
Washington, Baltimore & Annapolis Elec. R.R	3
Massachusetts	
Boston Elevated Ry.	241
Boston, Worcester & New York Street Ry.	15
Eastern Massachusetts Street Ry.	74
Fitchburg & Leominster Street Ry.	5
*Gardner—Templeton Street Ry.	7
Holyoke Street Ry.	3
Interstate Street Ry.	8
Middlesex & Boston Street Ry.	70
Plymouth & Brockton Street Ry.	3
Springfield Street Ry.	36
Union Street Ry.	13
Worcester Consolidated Street Ry.	47
Michigan	
City of Detroit, Department of Street Rys.	310
Detroit United Ry.	218
Peoples Motor Coach Co.	
Grand Rapids, Grand Haven & Muskegon Ry.	6
Grand Rapids Ry.	10
Michigan Electric Ry.	44
Michigan R.R.	15
Muskegon Traction & Lighting Co.	3
Saginaw Transit Co.	28

	No. Bus Jan. 1, 1928
Minnesota	
Duluth Street Ry.	14
Duluth-Superior Coach Co.	
Twin City Rapid Transit Co.	109
Twin City Motor Bus Co.	
Mississippi	
Mississippi Power Co.	
(Gulfport Division)	20
*(Hattiesburg Division)	7
*(Meridian Division)	7
Mississippi Power & Light Co	
(Jackson Division)	1
*(Vicksburg Division)	3
Missouri	
Hannibal Transportation Co.	11
Kansas City, Clay County & St. Joseph Ry.	13
Kansas City, Clay County & St. Joseph Auto Transit Co.	
Kansas City Public Service Co.	69
Missouri Power & Light Co.	2
Springfield Traction Co.	12
St. Louis Electric Terminal Ry.	6
St. Louis Public Service Co.	42
St. Louis Bus Co.	
*West Missouri Power Co.	2
Montana	
Butte Electric Ry.	5
Nebraska	
Lincoln Traction Co.	14
Omaha & Council Bluffs Street Ry.	10
Omaha, Lincoln & Beatrice Ry.	3
Omaha & Lincoln Railway & Light Co.	6
New Hampshire	
*Exeter, Hampton & Amesbury Street Ry.	6
*Keene Electric Ry.	6
*Laconia Street Ry.	11
Laconia Transit Co.	
*Manchester & Derry Street Ry.	3
Nashua Street Ry.	3
*Portsmouth Electric Ry.	12
*Portsmouth Power Co.	6
New Jersey	
Central Passenger Ry., Atlantic City	7
Coast Cities Ry.	25
Atlantic Coast Transportation Co.	
Cumberland Traction Co.	15
Cumberland Transit Co.	
Maurice River Transportation Co.	
Morris County Traction Co.	9
*New Jersey Inter-Urban Co.	8
New Jersey Interurban Coach Co.	
Ocean City Electric R.R.	1
Public Service Ry.	1276
Public Service Transportation Co.	
Penn-Jersey Transit Co.	
Trenton & Mercer County Traction Corp.	29
Central Transportation Co.	
New Mexico	
City Electric Co., Albuquerque	1
New York	
Auburn & Syracuse Electric R.R.	8
Mid-State Coach Lines	
Binghamton Ry.	18
Brooklyn-Manhattan Transit Corp.	10
Buffalo & Erie Ry.	3
Buffalo & Erie Coach Corp.	
Cortland County Traction Co.	3
Cortland County Bus Lines	
Eastern New York Utilities Corp.	3
Empire State R.R.	6
Mid-State Coach Lines.	
Fonda, Johnstown & Gloversville R.R.	1
Sacandaga Valley Transportation Corp.	
Geneva, Seneca Falls & Auburn R.R.	3
Hamburg Railway	2
Huntington Traction Co.	4
International Ry.	86
International Bus Corp.	
Jamestown Street Ry.	18
Jamestown Motor Bus Transportation Co.	
Kingston Consolidated R.R.	5
Kingston City Transportation Corp.	
*Newburgh Public Service Co.	27
New York & Stamford Ry.	50
County Transportation Co., Inc.	

* No rail operation.

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Table I—Bus Operation by Electric Railways and Subsidiary Companies—(Concluded)

	No. Bus Jan. 1, 1928
New York State Rys. (Rochester) *Darling Bus Line* *East Avenue Bus Co.* *Rochester Interurban Bus Co.* *Rochester Railways Co-ordinated Bus Lines*	64
New York State Rys. (Syracuse) *Syracuse Railway Co-ordinated Bus Line*	17
New York State Rys. (Utica) *Utica Railway Co-ordinated Bus Line*	9
Niagara Gorge R.R. *Niagara Gray Bus Lines*	4
Olean, Bradford & Salamanca Ry. *Olean, Bradford & Salamanca Bus Line*	6
*Peekskill Lighting & R.R. Co. *Peekskill Motor Bus Corp.*	29
*Port Jervis Transit Co.	2
Poughkeepsie & Wappingers Falls Ry.	2
Rochester & Syracuse R.R. *Mid-State Coach Lines*	1
Syracuse & Eastern R.R. *Syracuse & Eastern Bus Lines*	3
Third Avenue Ry. *Eastchester Transportation Corp.* *North Street Transportation Corp.* *Westchester Street Transportation Co.*	41
United Traction Co. *Capital District Transportation Co.*	80
*Walkill Transit Co.	8
Watertown Transportation Co.	16
North Carolina	
Carolina Power & Light Co.	19
Durham Public Service Co.	17
North Carolina Public Service Co. *Greensboro Bus Co.*	2
Southern Public Utilities Co.	20
Tidewater Power Co. *Coast City Transit Co.*	3
North Dakota	
Northern States Power Co. *Northern Transit Co.*	3
Ohio	
Cincinnati, Lawrenceburg & Aurora Electric Street Ry.	7
Cincinnati Street Ry.	68
City of Ashtabula—Division of Street Rys.	3
Cleveland Ry.	161
Cleveland, Southwestern Ry. & Light Co. *Southwestern Bus Co.*	14
Columbus, Delaware & Marion Elec. Co.	4
Columbus Railway, Power & Light Co.	3
*Columbus, Urbana & Western Electric Ry.	2
Community Traction Co Dayton	36
Dayton Street Ry.	3
Dayton, Springfield & Xenia Southern Ry.	2
Indiana, Columbus & Eastern Traction Co. *Dayton & Columbus Transportation Co.*	34
Lake Shore Electric Ry.	7
Maumee Valley Co. *Maumee Valley Transportation Co.*	13
Nelsonville-Athens Electric Ry. *Nelsonville Transportation Co.*	1
Northern Ohio Power & Light Co.	217
Ohio Public Service Co.	3
Ohio Service Co.	5
Penn Ohio Elec. Co Youngstown Municipal Ry. *West End Traction Co.* *Akron Youngstown Co.* *Penn Ohio Coach Lines* *Cleveland Mahoning Valley Coach Lines* *New Castle Elec. St. Ry.* *H. A. K. Bus Co.* *Penn Ohio Tourist Co.*	116
Portsmouth Public Service Co.	9
Southern Ohio Public Service Co. *Columbus & Zanesville Transportation Co.*	33
Springfield Ry.	1
Steubenville, East Liverpool & Beaver Valley Traction Co.	1
Toledo & Indiana R.R.	1
Youngstown & Ohio River R.R.	4
Youngstown & Suburban Ry.	14
Oklahoma	
Northeast Oklahoma R.R.	5
Oklahoma Ry.	26
Oklahoma Union Ry. *Union Transportation Co.*	80
*Okmulgee Traction Co.	3
*Shawnee-Tecumseh Traction Co.	7
Tulsa Street Ry.	5
Oregon	
Oregon Electric Ry.	6
Portland Electric Power Co.	39
*Southern Pacific System (Salem)	3
Pennsylvania	
Altoona & Logan Valley Electric Ry. *Logan Valley Bus Co.*	20
Bangor & Nazareth Transit Co.	3
Bangor & Portland Transit Co. *Paul R. La Bar*	2
Beaver Valley Traction Co. *Beaver Valley Motor Coach Co.*	19
*Berwick & Nescopeck Street Ry.	2
Chambersburg & Shippensburg Ry. *Cumberland Valley Transit Co.*	4
Citizens Traction Co. *Citizens Transit Co.*	13
Conestoga Traction Co. *Conestoga Transportation Co.*	4
*Duquesne & Dravosburg Street Ry.	2
East Penn Electric Co.	5
Erie Ry. *Erie Coach Co.*	8
Johnstown & Somerset Ry.	1
Johnstown Traction Co. *Traction Bus Co.*	12
Lackawanna & Wyoming Valley R.R. *Laurel Line Bus Co.*	5
Lehigh Traction Co. *Hazleton Auto Bus Co.*	10
Lehigh Valley Transit Co. *Lehigh Valley Transportation Co.*	19
Lewiston & Reedsville Electric Ry. *Lewiston & Reedsville Transportation Co.*	5
*North Branch Bus Co.	9
Northumberland County Ry. *Sunbury Transit Co.*	3
Northwestern Electric Service Co. *Penn Public Motor Transportation Co.*	9
Philadelphia Rapid Transit Co. *Philadelphia Rural Transit Co.* *Penn-Jersey Transit Co.*	569
Philadelphia & Westchester Traction Co. *Aronimink Transportation Co.*	24
Pittsburgh, Mars & Butler Ry. Pittsburgh, Harmony, Butler & New Castle Ry. *Harmony Short Line Motor Transportation Co.*	8
Pittsburgh Rys. *Pittsburgh Motor Coach Co.*	46
Reading Transit Co.	6
Schuylkill Ry.	11
Scranton Montrose & Binghamton R.R.	2
Scranton Ry. *Scranton Bus Co.*	15
Shamokin & Edgewood Electric Ry. *Shamokin & Trevorton Bus Line*	6
Shamokin & Mt. Carmel Transit Co. *Ashland & Centralia Bus Co.*	3
Southern Cambria Ry. *Southern Cambria Bus Co.*	4
Stroudsburg Traction Co. *East Stroudsburg Bus Co.*	3
*United Traction Street Ry. *Du Bois Transit Co.*	2
West Chester Street Ry. *Peoples Transportation Corp.*	65
Westmoreland County Ry. *Chestnut Ridge Transportation Co.*	5
West Penn Rys. *Penn Bus Lines*	3
Westside Electric Street Ry. *Westside Motor Transit Co.*	3
Wilkes-Barre Ry.	28
Williamsport Railways. *Williamsport Transportation Co.*	2
York Rys. *York Transit Co.*	4
Rhode Island	
*Newport Electric Corp.	21
*Newport & Providence Ry.	22
United Electric Rys.	60
South Carolina	
South Carolina Gas & Electric Co. *Sparta"snburg Bus Co.*	8
South Dakota	
Sioux Falls Traction System	18
Tennessee	
Nashville Interurban Ry. *Interurban Bus Co.*	9
Nashville Railway & Light Co.	13
Tennessee Electric Power Co.	5
Union Traction Co.	1
Texas	
Abilene Traction Co.	3
Austin Street Ry.	2
Dallas Ry. & Terminal Co.	7
Eastern Texas Electric Co.	9
El Paso Electric Co.	6
Galveston Electric Co. *Texas Bus Lines, Inc.*	4
Houston Electric Co.	44
*Marshall Traction Co.	3
Northern Texas Traction Co.	9
*Nueces Ry.	2
*Rio Grande Valley Traction Co.	5
San Antonio Public Service Co.	45
*Southwestern Transit Co.	4
Texas Electric Ry.	6
Wichita Falls Traction Co.	8
Utah	
Bamberger Electric R.R.	2
Utah-Idaho Central R.R.	4
Utah Light & Traction Co.	9
Vermont	
Burlington Traction Co.	3
*Twin State Gas & Electric Co.	4
Virginia	
Lynchburg Traction & Light Co.	2
Norfolk Southern R.R.	3
Roanoke Railway & Electric Co.	7
Virginia Electric & Power Co.	216
Virginia Public Service Co. *Citizens Rapid Transit Co.*	4
Washington	
Grays Harbor Ry. & Light Co. *Twin City Transit Co.*	8
Lewiston-Clarkston Transit Co.	2
Pacific Northwest Traction Co.	20
Puget Sound International Ry. & Pwr. Co.	16
Puget Sound Power & Light Co.	120
Seattle Municipal St. Ry.	33
Seattle & Rainier Valley Ry.	2
Tacoma Municipal Belt Line	1
Yakima Valley Transportation Co.	3
West Virginia	
Charleston Interurban R.R.	49
Monongahela-West Penn Public Service Co. *Monongahela Transport Co.*	41
Ohio Valley Electric Ry. *Ohio Valley Bus Co.*	23
Wheeling Public Service Co.	5
Wheeling Traction Co. *Ohio Valley Transit Co.*	12
Wisconsin	
Madison Rys.	10
Milwaukee Electric Ry. & Light Co. *Wisconsin Motor Bus Lines*	160
Wisconsin Gas & Electric Co.	10
Wisconsin Michigan Power Co. *Intercity Bus Co.*	16
Wisconsin Power & Light Co. *The Orange Line*	52
Wisconsin Public Service Corp. *Riverview Motor Bus Co.*	13
Wisconsin Valley Electric Co.	4
Wyoming	
*Cheyenne Motor Bus Co.	5
Canada	
British Columbia Electric Ry. *British Columbia Transit Co.*	22
Dominion Power & Transmission Co.	23
Grand River Ry. *Canadian Pacific Transport Co., Ltd.*	3
Hydro-Electric Rys.	18
Levis Tramways.	1
London Street Ry.	6
Montreal Tramways.	86
New Brunswick Power Co.	1
Ottawa Electric Ry.	12
Pictou County Electric Co.	2
Quebec Railway, Light & Power Co.	11
Toronto Transportation Commission. *Gray Coach Lines, Ltd.*	137
Winnipeg Electric Ry.	38
*Woodstock, Thames Valley & Ingersoll Electric Ry.	3
Hawaii	
Honolulu Rapid Transit Co.	6
Panama	
Panama Electric Co.	2
Porto Rico	
Ponce Electric Co.	4

*No rail operation.

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Table II—Buses Bought by Railways During 1927

Name of Company	Total	Total Type	Type Chassis	Body Builder	Seating Capacity
Alabama					
Birmingham Electric Co.	4	4	Graham	Graham	21
Selma Elec. Ry.	2	2*	Reo	Reo	15
California					
Key System Transit Co.	1	1	Twin Coach	Twin Coach	40
Los Angeles Ry.	29	8	Yellow	Yellow	29
		11	Fageol-Cal.	Fageol	29
		4	Yellow	Yellow	21
		1	Twin Coach	Twin Coach	45
		1	Fageol-Cal.	Fageol	58
		4	Yellow	Yellow	63
Market Street Ry.	3	3	Single Motor Co.	Fageol	29
Municipal Ry. of San Francisco	4	3	Mack	California Motor Coach	25
		1	Fageol-Cal.	Fageol	29
Pacific Elec. Ry.	8	8	Yellow	Yellow	29
San Diego Elec. Ry.	3	1	A.C.F.	A.C.F.	31
		1	Fageol-Cal.	Fageol	31
		1	Twin Coach	Twin Coach	40
San Francisco, Napa & Calistoga Ry.	2	2	Yellow	Yellow	21
Southern Pacific Co.—Electric Lines	45	2	Mack	Mack	25—35
		1	Mack	Mack	29
		16	Yellow	Yellow	29
		7	Yellow	Yellow	21
		1	Graham	Graham	21
		2	A.C.F.	A.C.F.	23
		1	A.C.F.	A.C.F.	21
		3*	Mack	Mack	23
		1*	Reo	Reo	12
		3*	Moreland	Moreland	16
		8*	White	White	20
Colorado					
Colorado Springs & Interurban Ry.	2	2	Yellow	Yellow	21
Denver & Interurban Motor Co.	10	6	Yellow	Yellow	30
		2	International	Lang	29
		2	Yellow	Yellow	21
Grand River Valley Ry.	2	2	Graham	Graham	21
Connecticut					
Connecticut Co.	23	11	Mack	Mack	29
		12	Yellow	Yellow	29
Delaware					
Delaware Elec. Pwr. Co..	3	3*	.....	.....	..
District of Columbia					
Capital Traction Co.	11	1	A.C.F.	A.C.F.	23
		6	Yellow	Yellow	21
		2	Yellow	Yellow	29
		1	A.C.F.	A.C.F.	29
		1	Twin Coach	Twin Coach	37
Washington Ry. & Elec. Co.	20	10	Yellow	Yellow	29
		10	Yellow	Yellow	21
Idaho					
Boise Street Car Co.	1	1*	Mack	Mack	29
Illinois					
Central Illinois Public Service Co.	4	4	Studebaker	Studebaker	21
Chicago Surface Lines	5	5	Twin Coach	Twin Coach	40
Chicago & West Towns Ry.	6	6	Mack	Mack	..
East St. Louis & Suburban Ry.	8	2	Pierce Arrow	Buffalo	29
		3	Mack	Mack	29
		3*	Reo	Reo	21
Evanston Ry.	3	3	Yellow	Yellow	21
Illinois Power Co.	6	5	Mack	Mack	29
		1	Mack	Mack	25
Illinois Power & Light Co.	24	10	Dodge	Graham	21
		14	Yellow	Yellow	21
Illinois Traction System.	7	4	Studebaker	Studebaker	21
		1	A.C.F.	A.C.F.	27
		2	Mack	Mack	29
Indiana					
Shore Line Motor Coach Co.:					
Southwestern Michigan Motor Coach Co.	43	10	A.C.F.	A.C.F.	28
		6	A.C.F.	A.C.F.	26
		22	Yellow	Yellow	29
		3	White	Bender	25
		1	Yellow	Yellow	21
		1*	Twin Coach	Twin Coach	37
Union Traction Co.	2	2	Mack	Mack	25
Iowa					
Cedar Rapids & Iowa City Ry.	1	1	Studebaker	Studebaker	14
Fort Dodge, Des Moines & Southern R.R.	5	2	Yellow	Yellow	29
		3	A.C.F.	A.C.F.	29
Iowa Southern Utilities Co.	8	8	Mack	Mack	25
Tri-City Ry.	5	5	Mack	Mack	29
Kansas					
Arkansas Valley Interurban Ry.	2	2	Studebaker	Studebaker	18
Kansas City, Leavenworth & Western Ry.	6	6	Mack	Mack	25
Kansas Electric Power Co.	4	3	Yellow	Yellow	21
		1	G.M.C.	Lang	21
Topeka Ry.	6	6	Yellow	Yellow	21
Kentucky					
Kentucky Traction & Termina. Co.	1	1	Yellow	Yellow	21
Kentucky Utilities Co. (Paducah)	4	4	Yellow	Yellow	21
Louisville Ry.	6	6	Reo	Reo	21
Louisiana					
Louisiana Electric Co..	9	9	Yellow	Yellow	21
New Orleans Public Service, Inc.	11	2	A.C.F.	St. Louis Car. Co.	28
		9	Yellow	Yellow	28
Maryland					
Cumberland & Western-port Transit Co.	5	4	Mack	Mack	29
		1	White	Leonhardit	14
Potomac Edison Co.	18	4	Studebaker	Superior	21
		4	International	Lang	28
		10	International	Lang	18
United Rys. & Elec. Co.	37	10	Mack	Mack	24
		2	Mack	Mack	29
		4	Brockway	Brockway	16
		20	Mack	Wolfington	29
		1	Nash	Nash	7
Washington, Baltimore & Annapolis Electric R.R.	3	3	Yellow	Yellow	29
Massachusetts					
Boston Elevated Ry.	12	7	White	Brown	29
		2	Mack	Mack	29
		1†	Mack	Mack	29
		1†	Fageol-A.C.F.	Fageol-A.C.F.	29
		1†	Versare	Versare	35
Eastern Massachusetts Street Ry.	11	4	A.C.F.	Brown	29
		1	A.C.F.	A.C.F.	29
		1	Fageol-A.C.F.	Fageol	29
		4	White	Brown	29
		1†	Fageol-A.C.F.	Fageol	29
Gardner-Templeton Street Ry.	3	1	Pierce Arrow	Paterson	24
		1	Wachusett	Wachusett	25
		1	White	Bender	29
Holyoke Street Ry.	1	1†	Mack	Mack	25
Middlesex & Boston Street Ry.	18	18	White	Bender	29
Springfield Street Ry.	9	6	Mack	Mack	29
		3	Yellow	Yellow	29
Union Street Ry.	1	1	White	Wason	29
Worcester Consolidated Street Ry.	30	7	Yellow	Lang	29
		4	White	Brown	29
		5	Fageol-A.C.F.	.....	29
		14	Yellow	Farnham Nelson	29
Michigan					
City of Detroit—Dept. of Street Rys.	1	1	Graham	Graham	12
Detroit United Ry.	12	5	A.C.F.	A.C.F.	27
		6*	White	Bender	28
		1*	White	Bender	18
Grand Rapids, Grand Haven & Muskegon Ry.	6	6	A.C.F.	A.C.F.	27
Muskegon Traction & Lighting Co.	1	1	Reo	Reo	21
Minnesota					
Duluth Street Ry.	4	4	Yellow	Yellow	21
Twin City Rapid Transit Co.	18	8	Mack	Eckland	29
		5	Mack	Eckland	25
		2†	Yellow	Eckland	29
		1	Fageol-A.C.F.	Eckland	29
		2	Twin Coach	Twin Coach	40
Mississippi					
Mississippi Power & Light Co. (Vicksburg Div.)	1	1	Yellow	Yellow	21

* Second hand. † Gas-electric.

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Table II—Buses Bought by Railways During 1927—(Continued)

Name of Company	Total	Total Type	Type Chassis	Body Builder	Seating Capacity
Missouri					
Kansas City, Clay County & St. Joseph Ry.	2	2	.....	.....	24
St. Louis Electric Terminal Ry.	4	4	Studebaker	Studebaker	21
St. Louis Public Service Co.	2	2	White	.....	21
Montana					
Butte Electric Ry.	2	2	Fageol-A.C.F.	Fageol	29
New Hampshire					
Laconia Street Ry.	6	4	Reo	Reo	21
		1	Stewart	Stewart	21
		1	Studebaker	Studebaker	20
New Jersey					
Central Passenger Ry.	7	6	Yellow	Yellow	21
		1	Yellow	Yellow	29
Coast Cities Ry.	2	2	Yellow	Yellow	21
Public Service Ry.	316	65†	A.C.F.	P.S.	31
		17	A.C.F.	A.C.F.	30
		38	A.C.F.	A.C.F.	29
		40	Mack	Mack	29
		107†	Mack	Mack	29
		10	White	Bender	29
		16	White	Bender	22
		20	Yellow	Yellow	29
		3	Mack	Mack	25
New York					
Binghamton Ry.	6	4	Mack	Mack	25
		2	Larrabee	Larrabee	23
Buffalo & Erie Rv.	3	3	Mack	Mack	21
Hamburg Ry.	2	1	Mack	Special	29
		1	Mack	Lang	25
Huntington Trac. Co.	4	1	Mack	Mack	29
		1*	Mack	Mack	29
		2*	Mack	Mack	25
International Ry.	33	23†	Yellow	Yellow	33
		10†	Yellow	Yellow	27
Jamestown Street Ry.	11	11	Reo	Fitzjohn	21
Newburgh Public Service Corp.	6	1	Mack	Mack	25
		5*	Guilder	Guilder	25
New York & Stamford Ry.	50	50	Mack	Mack	29
New York State Rys.	8	5	Mack	Bender	29
		3	White	Bender	25
Orlean, Bradford & Salamanca Ry.	1	1	A.C.F.	Baker Ranlang	18
Poughkeepsie & Wappingers Falls Ry.	2	2	A.C.F.	A.C.F.	23
Third Avenue Railway	21	14	A.C.F.	A.C.F.	29
		4	Mack	Mack	29
		3	Mack	Mack	25
United Traction Co.	27	20†	Mack	Mack	29
		3†	Mack	Mack	41
		4†	Versare	Versare	37
North Dakota					
Northern States Power Co.	1	1	Reo	Fitzjohn	21
Ohio					
Cincinnati Street Railway	1	1	Mack	Mack	29
Cleveland Railway	50	10	White	Lang	22
		20	White	Lang	29
		10	Yellow	Yellow	29
		8	Six Wheel	Hoover	61
		1†	Versare	Versare	39
		1†	Versare	Versare	37
Cleveland Southwestern Ry. & Light Co.	11	4	White	Bender	29
		7*	White	Bender	29
Columbus, Delaware & Marion Electric Co.	4	3	Buick	Flexible Co	12
		1	Buick	Buick	7
Community Traction Co.	6	6	Yellow	Yellow	21
Indiana, Columbus & Eastern Traction Co.	3	2	Buick	Buick	14
		1	White	Bender	20
Northern Ohio Power & Light Co.	16	3	White	Lang	29
		5	A.C.F.	A.C.F.	30
		2	N.O.P. & L. Co.	Lang	29
		1	Yellow	Yellow	30
		3*	Garford	Garford	19
		1*	Stroughton	Stroughton	20
		1*	Dodge-Graham	.....	18
Pennsylvania-Ohio Electric Co.	6	6	White	Bender	29
Oklahoma					
Oklahoma Ry.	6	4	Yellow	Yellow	21
		2	Graham	Graham	21
Oklahoma Union Ry.	8	8	Mack	Lang	25
Shawnee-Tecumseh Traction Co.	7	7	Yellow	Yellow	21
Pennsylvania					
Beaver Valley Traction Co.	3	3	Gen. Motors	Gen. Motors	21
Citizens Traction Co.	2	2	Yellow	Yellow	..
East Penn Electric Co.	5	3	Mack	Mack	29
		1*	White	.....	21
		1*	White	.....	16
Erie Rys.	2	2	Yellow	Yellow	21
Johnstown Traction Co.	2	1	Yellow	Yellow	21
		1	Yellow	Yellow	21
Lehigh Valley Transit Co.	5	3	Mack	Mack	29
		2	Mack	Mack	20
Lewistown & Reedsville Electric Ry.	4	4	White	.....	29
North Branch Bus Co.	1	1	Mack	Mack	25
Northwestern Electric Service Co.	4	4	.....	.....	21
Philadelphia Rapid Transit Co.	205	52	Yellow	Yellow	29
		103	Yellow	Yellow	33
		50	Yellow	Yellow	50
Philadelphia & West Chester Traction Co.	5	5	White	Bender	21
Pittsburgh Rys.	23	20	Yellow	Yellow	19
		1	White	Bender	16
		1	Six-Wheel	Wolfington	29
		1	Twin Coach	Twin Coach	35
Reading Transit Co.	6	2	White	Bender	29
		3	White	Bender	25
		1	White	Bender	21
Schuylkill Transportation Co.	3	2	Yellow	Yellow	33
		1	Yellow	Yellow	29
Scranton, Montrose & Binghampton R.R.	2	2	.....	.....	..
Scranton Ry.	4	4	A.C.F.	A.C.F.	29
Shamokin & Edgewood Elec. Ry.	1	1	Mack	Mack	25
Shamokin & Mt. Carmel Transit Co.	3	1	Yellow	Yellow	21
		1	Assemble	Hahn	17
		1*	Reo	Reo	12
Westmoreland County Ry.	1	1*	Studebaker	Studebaker	..
West Penn Rys.	1	1	International	Lang	18
Wilkes Barre Ry.	7	7	Yellow	Yellow	29
Rhode Island					
United Electric Rys.	4	4	Mack	Mack	25
South Dakota					
Sioux Falls Traction System	4	1	White	Eckland	17
		1	White	Eckland	19
		1	Studebaker	Superior	15
		1	Studebaker	Superior	19
Texas					
Abilene Traction Co.	1	1	Reo	Fitzjohn	21
Eastern Texas Electric Co.	4	1	Graham	Graham	21
		3	Yellow	Yellow	21
El Paso Electric Co.	2	1	Yellow	Yellow	21
		1*	Reo	Reo	21
Houston Electric Co.	7	2	Yellow	Yellow	33
		2	Mack	Mack	33
		1	A.C.F.	A.C.F.	29
		2	Twin Coach	Twin Coach	40
Northern Texas Traction Co.	5	2	Yellow	Yellow	21
		3	Reo	Reo	21
San Antonio Public Service Co.	2	2	Yellow	Yellow	21
Southwestern Transit Co.	1	1	Reo	Bender	18
Utah					
Utah Light & Traction Co.	6	1	Mack	Alumi. Products	29
		1	Mack	Mack	29
		1	Graham	Graham	21
		3*	Mack	Mack	21
Vermont					
Burlington Traction Co.	2	1	Studebaker	Studebaker	21
		1	Reo	Reo	16
Twin State Gas & Electric Co.	1	1	White	Brown	21
Virginia					
Roanoke Ry. & Electric Co.	1	1	Graham	Graham	21
Virginia Electric & Power Co.	25	10	Mack	Amer. Car Co.	29
		5	White	Bender	21
		10	Twin Coach	Twin Coach	40
Washington					
Puget Sound Pwr. & Lt. Co.	28	28	.....	.....	..
Seattle Municipal Street Ry.	2	2	Studebaker	Studebaker	21
Tacoma Municipal Belt Line	1	1	White	.....	24

* Second hand. † Gas-electric.

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Table II—Buses Bought by Railways During 1927—(Concluded)

Name of Company	Total	Total Type	Type Chassis	Body Builder	Seating Capacity
West Virginia					
Charleston Interurban R.R. Co.	17	7	Yellow	Yellow	17
		9	.....	.....	..
Monongahela West Penn Public Service Co.	37	9	International	Lang	18
		15*	Dodge	Dodge	18
		3*	White	.....	25
		3*	Reo	Reo	16
		4*	Studebaker	Studebaker	20
		2*	Menominee	Menominee	20
		1*	Garford	Garford	..
Wheeling Public Service Co.	1	1	Yellow	Yellow	21
Wheeling Traction Co.	5	5	International	Lang	18
Wisconsin					
Milwaukee Electric Ry. & Light Co.	19	2	Twin Coach	Twin Coach	40
		7	Yellow	Yellow	29
		7	International	Auto Body Co.	25
		2	International	Eckland	25
		1	Reo	Reo	17
Wisconsin Michigan Power Co.	5	5	.....	.....	..
Wisconsin Power & Light Co.	14	8	Fageol-A.C.F.	Fageol	29
		2	Menominee	Badger	21
		1	Menominee	Badger	16
		3	International	Eckland	26
Wisconsin Public Service Corp.	7	7	Yellow	Yellow	21

Name of Company	Total	Total Type	Type Chassis	Body Builder	Seating Capacity
Canada					
Dominion Power & Transmission Co.	13	6	Yellow	National Steel Car	21
		4	Gotfredson	Gotfredson	25—29
		2	White	.....	25—29
		1	Mack	Mack	25—29
Hydro-E.ectric Rys.	1	1	Gotfredson	Gotfredson	20
Levis Tramways.	1	1	Chevrolet	Chevrolet	10
Montreal Tramways.	31	1	Yellow	Can. Car & Fdry.	21
		1	Yellow	Can. Car & Fdry.	29
		25	Yellow	Yellow	33
		1†	Versare	Versare	40
		3†	Versare	Versare	35
New Brunswick Power Co.	1	1	Studebaker	Superior	20
Ottawa Electric Ry.	5	5	Reo	Ottawa Car Mfg. Co.	21
Toronto Transportation Commission	70	15	Mack	Bender	29
		3	Studebaker	Studebaker	21
		6	White	.....	29
		20	Ye.low	Yellow	29
		10	Mack	Mack	29
		3	Gotfredson	Gotfredson	18
		8	Mack	Mack	25
		2	Pierce Arrow	Pierce Arrow	29
		3	Buick	Buick	7
Winnipeg E.ectric Co.	16	10	Mack	Winnipeg Elec.	25
		3	Studebaker	Winnipeg Elec.	21
		3	Reo	Winnipeg Elec.	21
Total	1,801				

all, 27 electric railways were reported as ordering equipment of this type last year.

Only 63 double-deck buses were purchased in 1927 by the electric railways. This figure is smaller than that of any of the preceding three years. All three of the purchasers were large city companies which already had double-deck equipment in service. They were the Philadelphia Rapid Transit Company, which bought 50, the Cleveland Railway, eight, and Los Angeles Railway, five.

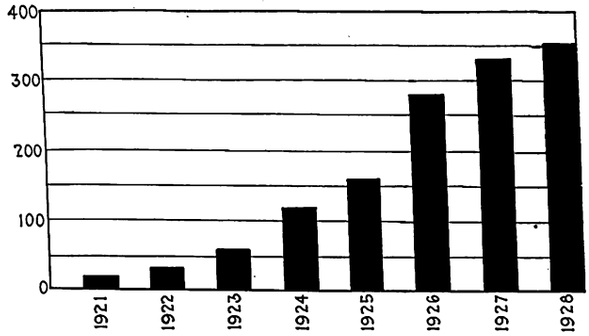
The increase in the number of electric railways operating buses from 333 at the beginning of the year to 351 at its close was proportionately smaller than the increase in the number of buses operated. This was a natural development, however, because a large majority of the railways situated where buses can be used to advantage had already undertaken bus operation at the beginning of the year. Because of operations carried on jointly with other railways, however, and because operations sometimes are carried out by holding companies in the name of their subsidiaries and in other instances by subsidiaries in the name of holding companies, the total number of railways operating is more a matter of opinion than of exact calculation.

Among the railways now operating buses which were not so listed a year ago are the Chicago Surface Lines, Washington, Baltimore & Annapolis Electric Railroad, Central Passenger Railroad at Atlantic City, N. J., New York and Stamford Railway, Poughkeepsie & Wappingers Falls Electric Railway, Oregon Electric Railway and Levis Tramways. The Reading Transit Company reappears on the list after having been dropped when bus operation was discontinued some time ago. The Louisiana Electric Company at Lake Charles and the Shawnee-Tecumseh Traction Company in Oklahoma discontinued all rail operation and now operate only buses.

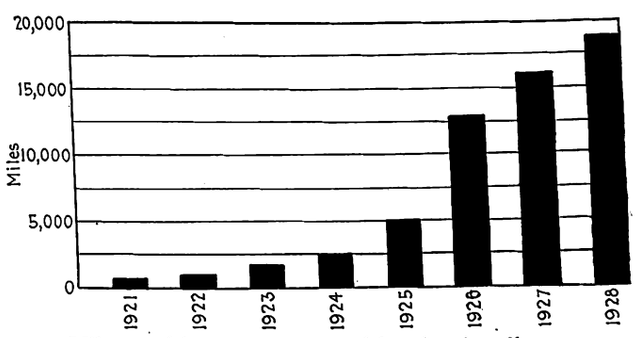
A number of companies which reported bus service a year ago are no longer on the list. The Waterbury & Milldale Tramway sold its buses to an independent operator, but continued its rail operation. The New Bedford & Onset Street Railway suspended all operation and bus service is now furnished by an independent agency. The Menominee & Marinette Light & Traction Company sold its bus equipment, as did the Philadelphia & Western Railway. The Mesaba Railway in Minnesota sold its buses to the Northern Pacific Railroad. In Canada the Windsor, Essex & Lake Shore Rapid Railway discontinued its bus operation altogether.

Nearly 3,200 miles of extensions were made last year to the bus route mileage of the electric railway systems. This was the largest increase in any recent year. Intercity bus route extensions were made by 53 electric railways and amounted to 2,840 miles. This was greatly in excess of the intercity bus route mileage added in 1926, which was only 1,830 miles. City bus extensions were made by 82 electric railways totaling 560 miles. This was somewhat less in 1926 when city bus route extensions totaled 840 miles.

From the foregoing figures it will be seen that the gross increase in route mileage for the year was approximately 3,400. Slightly more than 200 miles, however, was reported as having been abandoned during the year. Eighteen electric railways found it advisable to



Number of electric railways operating buses



Mileage of bus routes operated by electric railways

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Table III—Bus Route Extensions During 1927

Name of Railway	City Miles	Intercity Miles	Replaced Miles
California			
Bakersfield & Kern Electric Ry.	0.50	.....	.....
Key System Transit Co.	3.65	.....	.....
Market Street Ry.	7.06	.....	.....
Municipal Ry. of San Francisco	3.87	.....	.....
Pacific Electric Ry.	6.40	24.40	.....
San Francisco, Napa & Calistoga Ry.	.....	41.60	.....
Santa Barbara & Suburban Ry.	2.00	.....	.....
Southern Pacific Co.	.....	146.00	18.77
Connecticut			
Connecticut Co.	9.31	29.02	13.28
New Haven & Shore Line Ry.	.....	9.25	9.25
District of Columbia			
Capital Traction Co.	10.08	.....	1.13
Washington Ry. & Electric Co.	6.77	.....	.....
Florida			
Miami Beach Ry.	17.00	.....	6.10
Idaho			
Boise Street Car Co.	4.00	.....	4.00
Illinois			
Aurora, Elgin & Fox River Electric Co.	.....	22.00	.....
Central Illinois Public Service Co.	2.50	.....	1.19
Chicago Rys.	1.50	.....	.....
Chicago & West Towns Ry.	18.00	.....	.....
East St. Louis & Suburban Ry.	.....	32.40	.....
Gary Rys.	6.40	.....	.....
Illinois Power Co.	1.57	.....	.....
Illinois Power & Light Corp.	24.12	.....	24.12
Indiana			
Indianapolis Street Ry.	13.23	.....	.....
Iowa			
Cedar Rapids & Iowa City Ry.	.....	33.00	.....
Fort Dodge, Des Moines & Southern R.R.	.....	300.00	.....
Iowa Southern Utility Co.	4.65	.....	3.75
Tri-City Ry.	0.35	.....	.....
Kansas			
Kansas City, Lawrence & Topeka Electric R.R.	.....	7.00	7.00
Kansas City, Leavenworth & Western Ry.	1.07	1.58	4.83
Kansas Electric Power Co.	4.00	.....	1.50
Kentucky			
Kentucky Traction & Terminal Co.	1.55	.....	.....
Kentucky Utilities Co.	2.45	.....	2.45
Louisiana			
Louisiana Electric Co.	9.05	.....	10.20
New Orleans Public Service, Inc.	2.75	.....	.....
Maine			
York Utilities Co.	.....	19.00	31.50
Maryland			
Cumberland & Westernport Transit Co.	.....	11.20	11.20
Potomac Edison Co.	3.05	131.05	1.26
United Rys. & Electric Co.	4.80	.....	.....
Washington, Baltimore & Annapolis Elec. R.R.	9.00	29.00	.....
Massachusetts			
Boston Elevated Ry.	5.03	.....	.....
Boston, Worcester & New York Street Ry.	1.50	.....	1.50
Eastern Massachusetts Street Ry.	.....	46.00	.....
Gardner-Templeton Street Ry.	.....	8.50	.....
Middlesex & Boston Street Ry.	.....	16.10	10.65
Springfield Street Ry.	1.23	68.32	41.23
Worcester Consolidated Street Ry.	.....	69.00	58.23
Michigan			
City of Detroit, Department of Street Rys.	53.68	.....	.....
Detroit United Ry.	12.70	.....	.....
Grand Rapids, Grand Haven & Muskegon Ry.	.....	44.00	.....
Michigan Electric Ry.	0.77	.....	0.77
Minnesota			
Duluth Street Ry.	9.00	.....	.....
Twin City Rapid Transit Co.	1.10	.....	.....
Mississippi			
Mississippi Power & Light Co.	2.30	.....	2.30
Missouri			
Kansas City Public Service Co.	2.55	.....	.....
Missouri Power & Light Co.	.....	2.00	2.00
St. Louis Public Service Co.	2.04	.....	.....
Nebraska			
Lincoln Traction Co.	14.44	.....	10.67
New Jersey			
Public Service Ry.	.....	259.77	.....
New York			
Binghamton Ry.	2.60	.....	.....
Buffalo & Erie Ry.	.....	91.00	.....
United Traction Co.	9.21	.....	6.46
Eastern New York Utility Corp.	2.00	.....	2.00
Jamestown Street Ry.	4.00	.....	2.30
New York & Stamford Ry.	.....	43.17	23.13
North Carolina			
Durham Public Service Co.	0.21	.....	0.21
Ohio			
Cincinnati Street Ry.	13.80	*56.00	.....
Cleveland Ry.	3.60	.....	.....
Columbus, Delaware & Marion Electric Co.	9.80	7.50	5.00
Community Traction Co.	10.05	3.20	.....
Ohio Public Service Co.	2.75	.....	2.40
Oklahoma			
Oklahoma Ry.	3.50	.....	.....
Oklahoma Union Ry.	3.25	31.00	.....
Shawnee-Tecumseh Traction Co.	.....	9.51	9.51
Oregon			
Portland Electric Power Co.	12.00	.....	.....
Pennsylvania			
Altoona & Logan Valley Electric Ry.	0.60	1.60	.....
Erie Ry.	5.80	.....	.....
Johnstown Traction Co.	8.00	.....	.....
Lehigh Traction Co.	5.50	.....	.....
Lewistown & Reedsville Electric Ry.	3.00	.....	.....
Northwestern Electric Service Co.	9.80	.....	.....
Philadelphia Rapid Transit Co.	1.50	126.22	.....
Philadelphia & West Chester Traction Co.	.....	7.50	.....
Pittsburgh Rys.	1.80	*100.00	.....
Reading Transit Co.	.....	11.30	10.12
Scranton, Montrose & Binghampton R.R.	.....	41.00	.....
Scranton Ry.	7.30	*50.00	.....
Shamokin & Edgewood Electric Ry.	.....	2.00	2.00
Shamokin & Mt. Carmel Transportation Co.	.....	2.30	2.30
Westmoreland County Ry.	.....	13.00	.....
West Penn Rys.	.....	4.00	3.92
Rhode Island			
United Electric Rys.	3.45	38.33	27.01
South Dakota			
Sioux Falls Traction System	.....	280.00	.....
Texas			
Austin Street Ry.	10.10	.....	.....
Dallas Ry. & Terminal Co.	8.20	.....	0.81
Eastern Texas Electric Co.	8.90	19.84	.....
Houston Electric Co.	2.63	.....	.....
Northern Texas Traction Co.	7.44	.....	.....
Wichita Falls Traction Co.	0.50	.....	.....
Utah			
Utah Idaho Central R.R.	2.50	.....	2.50
Utah Light & Traction Co.	.....	10.21	9.51
Vermont			
Burlington Traction Co.	3.60	.....	0.50
Virginia			
Roanoke Ry. & Electric Co.	3.00	1.00	.....
Virginia Electric & Power Co.	64.38	.....	10.00
Washington			
Seattle Municipal Street Ry.	2.60	.....	.....
Tacoma Municipal Belt Line	8.00	.....	.....
West Virginia			
Charleston Interurban R.R.	.....	190.00	.....
Monongahela West Penn Public Service Co.	16.80	54.60	1.10
Wheeling Traction Co.	.....	40.00	.....
Wisconsin			
Wisconsin Power & Light Co.	.....	85.80	40.55
Wisconsin Public Service Corp.	1.50	10.40	10.81
Canada			
Montreal Tramways	5.97	.....	1.79
Toronto Transportation Commission	8.78	158.00	.....
Winnipeg Electric Co.	2.30	.....	1.75
Porto Rico			
Ponce Electric Co.	1.50	.....	1.10
Total	561.94	2,838.67	455.66

* Sightseeing or touring.

discontinue certain bus routes or parts of routes for various reasons, usually because of lack of adequate patronage to make the line profitable.

Adding the net increase of 3,200 miles to the 15,000 miles of bus route operated by electric railways at the beginning of the year a total mileage of considerably more than 18,000 is indicated today. Of this total, however, only a comparatively small amount represents replacement of electric railway service. The cumulative total of track on which car service had been replaced by bus service was 1,400 miles on Jan. 1, 1927. During the past year bus service replaced car service on approximately 470 miles of track, making the present total of track which has been abandoned in favor of the bus about 1,900 miles.

Other automotive equipment bought during the past year totaled 207 vehicles, including freight and express trucks, service trucks, tower trucks, dump trucks and snow handling equipment. For 1926 this total was 347. The biggest purchaser of automotive service equipment in 1927 was the Milwaukee Electric Railway & Light Company, which bought 40 such vehicles. The British Columbia Electric Railway purchased 23 vehicles, including freight and express and service cars, the Boston Elevated bought 17 vehicles and the Public Service Railway sixteen.

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$39,676,000 of Bonds Placed

Bulk of financing was done by city systems at prices that compare favorably with those to other borrowers under present conditions. Maturities for year much lower than for 1927

WITH one exception the financing done in the electric railway field in 1927 was for amounts running into large figures. The outstanding issue was, of course, the offering of $18,000,000 of Twin City Rapid Transit Company first and refunding 5½ per cent gold bonds, placed with investors at a price to yield about 5.70 per cent. Next in importance in the order of size came the Cincinnati Street Railway issue, placed in April with investors at an even 5 per cent yield. Next in size came the two Boston issues, one for $4,626,000, placed in January, to yield 5 per cent, and the other for $1,885,000, placed in April, to yield 4.936 per cent.

The $2,000,000 Omaha & Council Bluffs Railway & Bridge issue was placed in November, to yield 6 per cent. The Chicago Rapid Transit issue of $1,795,000 was placed in May, to yield 6.565 per cent. The Denver Tramway issue of $1,750,000, placed in March, to yield 6,304 per cent, and the Philadelphia Rapid Transit Company equipment trust issue, placed in February, to yield 5 per cent, were somewhat different in character from the others. The total of $39,676,000 was greatly in excess of the total for the previous year, as the nine-year comparative record shows. That record also shows that the preponderance of the financing was done by the large city companies. Of course, there were some issues smaller in size that are not included in the table, which only shows amounts of $500,000 publicly offered. Their inclusion, however, would not make any material difference in the total. All the issues were placed at an average yield to the investor of approximately 5.5 per cent.

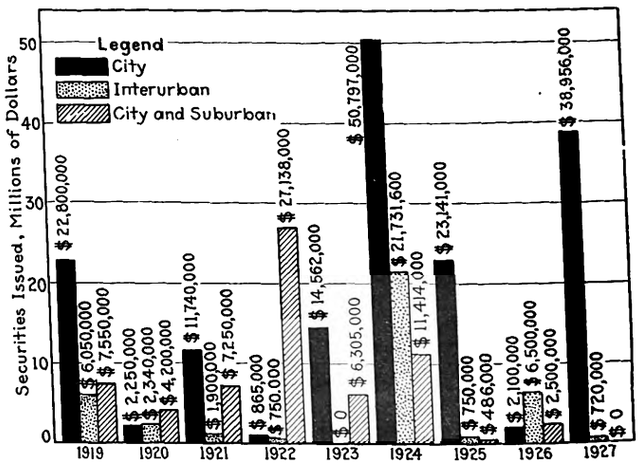
Table I—Nine-Year Record of New Electric Railway Financing Involving Bond or Note Issues of More Than $500,000

	City Railway	Interurban	City and Suburban
1919	$22,800,000	$6,050,000	$7,550,000
1920	2,250,000	2,340,000	4,200,000
1921	11,740,000	1,900,000	7,250,000
1922	865,000	750,000	27,138,000
1923	14,562,000	.....	6,305,000
1924	50,797,000	21,731,600	11,414,000
1925	23,141,000	750,000	486,000
1926	2,100,000	6,500,000	2,500,000
1927	38,956,000	720,000	0

Maturities for this year are way below the figure for 1927, being $47,577,200, compared with $180,798,000 in 1927. Of this $47,577,200 the two Omaha issues account for $10,918,000 and the two Minneapolis issues for $15,000,000. One of the Omaha maturities has already been arranged, and the Minneapolis issues are taken care of by that company's recent financing. This leaves a total of only a little more than $21,000,000 of maturities to be arranged in a period of easy money.

The amount of bonds in default has increased materially during the year, being more than $260,000,000, compared with more than $180,000,000 during the previous year. This is accounted for largely by the various Chicago issues, totaling more than $85,000,000. The interest on these issues is being paid, but the bonds were not refunded because of the failure of the city of Chicago to work out a new operating arrangement with the railway. In the table in which this subject is covered there is a default as to principal as well as to interest only where the maturity date appears after the issue. Technical defaults are not included in this tabulation.

This year it has been possible, with the aid of the American Electric Railway Association, to publish an additional table showing the disposition which was made of the issues that matured during 1927. The column which records the information that was available is self-revealing. It is significant in its showing of issues retired. Some of the large issues were refunded, and there appears to have been little trouble in negotiating this outcome or in arranging for the extension of the issue where that was deemed desirable. As a matter of fact, eighteen of the issues maturing were retired, against less than a dozen issues either refunded or extended. It is significant that the issues that were retired totaled more than $6,000,000.



The securities issued for electric railway properties last year reflect the large amount of refinancing necessary

One of the most interesting events of the year was the readjustment of finances by the Grand Rapids Railway as a result of which that company was succeeded by the Grand Rapids Railroad. It will be recalled that a plan of readjustment was suggested for the Grand

Table II—Comparison of Maturities in the Electric Railway Field

1928	$47,577,200	1923	$94,851,800
1927	180,798,000	1922	160,015,860
1926	26,644,790	1921	207,617,530
1925	28,224,000	1920	80,466,100
1924	73,051,600		

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Table III—Statement of Disposition of Principal Electric Maturities in 1927

	Rate	Amount	Disposition
January			
Chicago City & Connecting Railways clt.	5	$20,616,000	Default
Winnipeg Electric Street Railway 1st..	5	579,000	Retired
Interborough Rapid Transit equipment trust B	6½	450,000	Retired
Springfield & Eastern Street Railway 1st	7	330,000	Retired
Eastern Massachusetts Street Railway serial	6	300,000	Retired
New Bedford & Onset Street Railway 1st	6	280,000	Retired
Peoples Railway 1st	5	200,000	Retired
Wayne & Fifth Street Railroad 1st	5	200,000	Retired
Brooklyn City Railroad equipment trust	5	375,000	Retired
		$23,330,000	
February			
Chicago Railways 1st	5	$55,655,000	Principal in default but interest being paid.
Chicago City Railway 1st	5	33,926,000	
Chicago Railways Consolidated B	5	17,164,470	
Chicago Railways Consolidated A	5	16,703,800	
Calumet & South Chicago 1st	5	5,458,000	
Chicago Railways purchase money	5	3,969,300	
West End Street Railway debenture	6½	2,700,000	Refunded
Chicago Railways income	4	2,500,000	Defaulted
Philadelphia Rapid Transit equipment trust G	5½	237,500	Retired
Hagerstown & Northern Railroad 1st	5	200,000	Retired
Pittsburgh Railways car trust	6	200,000	Retired
		$138,714,040	
March			
Interborough Rapid Transit equipment trust A	6	$280,000	Retired
		$280,000	
April			
Denver City Tramway extended	6	$2,000,000	Refunded
Denver Tramway Power extended	6	693,000	Retired
Des Moines City Railway 5-year	7	618,000	Defulated
Enid City Railway 1st	5	235,000	
		$4,403,000	
May			
West End Street Railway 5-year	6	$1,956,000	Refunded
Jacksonville Electric (now traction) 1st	5	1,245,000	.....
New Castile Traction 1st	5	470,000	Retired
		$3,271,000	
June			
Galveston-Houston Electric 2-year	7	$1,200,000	Refunded
Berkshire Street Railway	7	777,000	Extended
Buffalo, Bellevue & Lancaster 1st	5	215,000	.....
		$2,192,000	
July			
Lorain & Cleveland Railway 1st	5	$750,000	$450,000 retired and $300,000 extended.
		$750,000	
August			
United Railways & Electric Company of Baltimore 5-year	6	$2,500,000	Refunded
Philadelphia Rapid Transit equipment trust G	5½	237,500	Retired
New Albany (Ind.) Street Railroad 1st	5	234,000	Retired
		$2,971,500	
September			
Worcester & South Bridge Street Ry	7	$500,000	Extended to Aug. 1, 1930 at 6 per cent.
		$500,000	
October			
South Bend & Southern Michigan Railway 1st	5	$750,000	Extended
Pittsburgh Traction 1st	5	684,000	Extended
Citizens Traction, Pittsburgh 1st	5	657,000	Extended
		$2,091,000	
November			
Worcester Consolidated Street Railway debenture	5	$1,200,000	Extended
Interborough Rapid Transit equipment trust C	6	570,000	Retired
		$1,770,000	
December			
Philadelphia Rapid Transit equipment trust H	5½	$270,000	Retired
Scranton Railway guaranteed notes	6	458,690	Extended
Altoona & Logan Valley Railway guaranteed	6	247,560	.....
		$975,560	
Total 1927		$180,798,000	

Rapids Railway, Grand Rapids, Mich., which contemplated the organization of a new company to take over the assets of the old company and the cancellation of all of its common stock and extinguishment of $600,000 of its indebtedness through the issue of common stock of the new company, and the exchange of preferred stock on the basis of two shares of new company common stock for one share of old preferred stock, the depositors of which were also offered subscription rights. The plan also provided for the authorization of additional preferred stock by the new company to provide funds further to reduce existing indebtedness and for other corporate purposes. It was explained that the changes suggested were deemed advisable at the time because

Table IV—Principal Electric Railway Maturities in 1928

(Based on Dow, Jones & Company's Compilation)

	Rate	Amount
January		
Omaha & Council Bluffs Street Railway consolidated	5	$8,995,000
Omaha & Council Bluffs Railway & Bridge consolidated	5	1,923,000
Oklahoma Railway collateral H notes	8	825,000
Stark Electric Railroad 1st	5	730,000
Los Angeles & Pasadena Electric Railway 1st	5	628,000
Interborough Rapid Transit equipment trust B	6½	450,000
Milford & Uxbridge Street Railway 1st	7	335,000
Eastern Massachusetts Street Railway serial	6	300,000
Pennsylvania & Maryland Street Railway 1st	5	216,000
Brooklyn City Railroad equipment trust	5	375,000
		$14,777,000
February		
Atlantic City & Shore Company collateral	4	591,000
Pittsburgh Railways four-year	6	500,000
Philadelphia Rapid Transit equipment trust G	5½	237,500
Pittsburgh Railways car trust	6	200,000
		$1,528,500
March		
Interborough Rapid Transit equipment trust A	6	280,000
		$280,000
May		
New York City Interborough Railway 1st	4	$2,164,000
		$2,164,000
June		
Blue Ridge Transportation Company (Maryland)	5	200,000
Monongahela Street Railway 1st	5	998,000
		$1,198,000
July		
North Hudson County Railway consolidated	5	$2,998,000
Chicago, North Shore & Milwaukee five-year	..	2,684,200
Lake Street Elevated Railroad 1st	5	1,598,000
Pittsfield Electric Street Railway 1st	7	242,000
		$7,522,200
August		
Philadelphia Rapid Transit equipment trust G	5½	237,500
Minneapolis Street Railway 1st	5½	5,000,000
		$5,237,500
September		
Southwest Missouri Electric refunding	6	1,150,000
		$1,150,000
October		
Minneapolis Street Railway & St. Paul City Railway joint consolidated	5	$10,000,000
		$10,000,000
November		
Dayton, Springfield & Urbana Electric Railway 1st	5	1,500,000
Interborough Rapid Transit equipment trust C	6	570,000
		$2,070,000
December		
Buffalo & Lackawanna Traction 1st	5	$1,160,000
Philadelphia Rapid Transit equipment trust H	5½	270,000
Hamilton Railway 1st	5	220,000
		$1,650,000
Total 1928		$47,577,200
Total 1927		$180,798,000

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Table V—Details of New Bond and Note Financing in Amounts of More than $500,000 Offered Publicly in 1927

Issue	Price	Maturity	Yield	Amount
January				
Boston Elevated Railway ten-year gold 5's	100	1937	5	$4,626,000
February				
Philadelphia Rapid Transit Company series K 5's	100	1927–36	5	1,900,000
March				
Denver Tramway first consolidated sinking fund 6's	98.50	1933	6.304	1,750,000
April				
Cincinnati Street Railway first general 5's, series "A"	100	1952	5	7,000,000
Boston Elevated Railway ten-year gold 5's	100.75	1937	4.936	1,885,000
May				
Chicago Rapid Transit first and refunding 6's	93	1953	6.565	1,795,000
November				
Omaha & Council Bluffs Railway & Bridge Company first (closed) mortgage 6 per cent sinking fund gold bonds	100	1947	6	2,000,000
December				
Twin City Rapid Transit Company first lien and refunding 5½ per cent gold bonds, series "A"	97	1952	5.70	18,000,000
Chicago, North Shore & Milwaukee Railroad Equipment Trust 5½ per cent gold certificates	101.266 to par	1942	5½–5½	720,000
Total				$39,676,000

of the large floating indebtedness of the old company and its lack of a medium for doing any financing other than through first mortgage bonds which could not be issued and sold in sufficient amount or at advantageous prices in view of the company's condition. The former floating debt position dated back to June 1, 1919, when three-year bonds amounting to $3,700,000 became due, which bonds were in turn isued to refund the long term 5 per cent bonds originally issued in 1900. The details of this plan were reviewed in the ELECTRIC RAILWAY JOURNAL for April 16, page 718.

Progress is also reported on the plan of readjustment of the capitalization of the many companies comprising the Pittsburgh Railways system intended to bring all of these properties into the ownership of one company with a simplified financial structure. It is hoped that some definite workable arrangement will develop in the near future.

In 1928 there will be a material reduction in maturities following the unusually large number last year

Table VI—Outstanding Electric Railway Bonds in Default of Interest

(Compiled by Dow, Jones & Company)

	Amount	Defaulted	
Auburn & Syracuse Elec. R.R. 5's	$1,752,000	April,	1926
Binghamton Railway cons 5's	1,833,000	May,	1926
general & refunding 6's	426,200	July,	1925
Binghamton Railroad 6's, 1925	452,000	July,	1925
Binghamton, Lestershire & Union 5's, 1925	147,000	June,	1925
Boise Valley Traction 5's, 1925	750,000	Jan.,	1923
Boise & Interurban Ry. 1st 5's	964,000	April,	1923
Buffalo & Lackawanna Traction 5's	1,150,000	Dec.,	1918
Calumet & South Chicago 5's, 1927	5,532,000	Feb.,	1927
Chatham, Wallace & Lake Erie 5's, 1925	694,500	July,	1925
Chicago & Interurban Traction 5's	1,816,000	Jan.,	1922
Chicago City & Connecting Railways 5's, 1927	20,616,000	Jan.,	1927
Chicago City Railway 5's, 1927	33,926,000	Feb.,	1927
Chicago Railways, 1st 5's, 1927	55,655,000	Feb.,	1927
consolidated A 5's, 1927	16,703,800	Feb.,	1927
consolidated B 5's, 1927	17,164,475	Feb.,	1927
purchase money 5's, 1927	4,073,000	Feb.,	1927
adjustment income 4's, 1927	2,500,000	Feb.,	1927
Clinton Street Ry., Clinton, Ia., 1st 5's, 1926	400,000	April	1926
Columbus, London & Springfield 5's, 1920	1,260,000	Oct.,	1920
Detroit, Altmont & Northern 6's	400,000	Aug.,	1925
Detroit, Jackson & Chicago 5's	881,000	July,	1925
Detroit, Monroe & Toledo Short L. 5's	3,000,000	July	1925
Detroit & Port Huron Shore Line 5's	2,500,000	July	1925
Detroit United Ry. coll. tr. 6's	8,472,000	July,	1925
2-year clt. notes 6's, 1926	640,000	Aug.,	1925
Detroit, Ypsilanti, Ann Arbor & Jackson 5's, 1926	1,610,000	Aug.	1925
Geneva, Seneca Falls & Auburn 5's	497,000	Jan.,	1926
Grand Rapids, Grand Haven & Muskegon 5's, 1926	1,500,000	Jan.,	1926
Indianapolis, Columbus & East Trac. 5's, 1926	6,400,000	Nov.,	1919
Indiana Northern Traction 5's	500,000	April,	1925
Indiana Union Traction 1st 5's	1,126,000	April,	1925
Indianapolis & Cincinnati Trac. 5's	1,400,000	July,	1923
Indianapolis, Newcastle & East 6's	1,200,000	June,	1925
Indianapolis Northern Traction 5's	5,000,000	Jan.,	1925
Indianapolis, Shelbyville & S. E. 5's	413,000	July,	1923
Indianapolis & Southeastern Tr. 5's	586,000	July,	1923
Inter-Urban Railway, Des Moines, 1st 7½'s	652,500	April,	1927
debenture 6's	250,000	Jan.,	1923
Ithaca Street Ry. 1st 6's, 1922	175,000	July,	1922
Ithaca Traction ref. 5's	488,000	April,	1922
Jackson Consol. Traction 5's	790,000	May,	1925
Jefferson Traction 6's, 1925	343,000	Jan.,	1925
Kansas City, Lawrence & Topeka 5's	$400,000	Sept.,	1919
Kansas-Oklahoma Traction 6's	250,000	Nov.,	1924
Lakeside Railway 1st 6's	150,000	May,	1926
Lima, Findlay & Toledo 5's, 1925	324,000	July,	1925
Lowell & Fitchburg St. Ry. 5's, 1926	275,000	Jan.,	1926
Michigan Electric Ry. ref. 5's	7,190,500	Jan.,	1925
Michigan Railroad 1st 6's, 1924	4,050,000	May,	1924
Milford, Holliston & Framingham St. Ry. 7's	165,000	July,	1925
Milford & Uxbridge St. Ry. 7's	335,000	July,	1925
Minneapolis, Anoka & Cuyuna Range Ry. 5's	380,000	Nov.,	1925
Mississippi Valley Ry. & Pwr. 5's	800,000	July,	1917
Morris County Traction, Newark, N. J., 1st 5's	3,000,000	June,	1922
Muncie, Hartford & Ft. Wayne 5's	916,000	Jan.,	1925
Muncie & Union City Traction 5's	925,000	Jan.,	1925
New York & Queens County Ry. cons. 4's	1,300,000	April,	1922
Ogdensburg Street Railway 6's	150,000	Sept.,	1925
Olean, Bradford & Salamanca Ry. 7's	264,000	Sept.,	1926
Penn Street Ry., Pittsburgh 1st 5's, 1922	250,000	June,	1922
Pittsburgh, Crafton & Mansfield 5's, 1924	171,000	July,	1924
Pittsburgh & W. End Pass. Ry. 5's, 1922	313,000	July,	1922
Puget Sound Electric Ry. cons. 5's	2,427,000	Aug.,	1927
Rochester & Syracuse R.R. 1st 5's	2,448,500	May	1927
Salt Lake & Utah 1st 5's	1,431,900	Oct.,	1925
convertible notes 7's	150,000	Oct.,	1925
Schuylkill Railway 1st 5's	180,000	April,	1926
Schuylkill Traction 1st 5's	500,000	April,	1926
consolidated 4½'s	105,000	July,	1926
Second Avenue R.R., New York, cons. 5's	5,682,000	Aug.,	1908
receivers' certificates 6's, 1914	3,140,000	Oct.,	1914
Steinway Railway, Long Island City 6's, 1922	1,500,000	July,	1922
South Bend & So. Mich. Ry. 5's, 1927	750,000	Oct.,	1927
Southwest Missouri Electric 6's	1,150,000	Sept.,	1926
Southwest Missouri R.R. 5's	1,034,000	Sept.,	1926
Syracuse, Lake Shore & Nor. 5's	2,500,000	May,	1927
Trenton, Bristol & Phila. Ry. 5's	413,800	March,	1925
Union Traction of Indiana gen. 6's	4,623,000	Jan.,	1925
Union Traction, Coffeyville, Kan. 5's	900,000	Jan.,	1925
Waterloo, Cedar Falls & Northern 5's	5,773,000	Jan.,	1922
Webb City Northern El. Ry., Joplin, Mo., 5's, 1923	125,000	Sept.,	1923
Youngstown & Ohio River 1st 5's	1,200,000	April,	1927
Total in default	$264,371,175		

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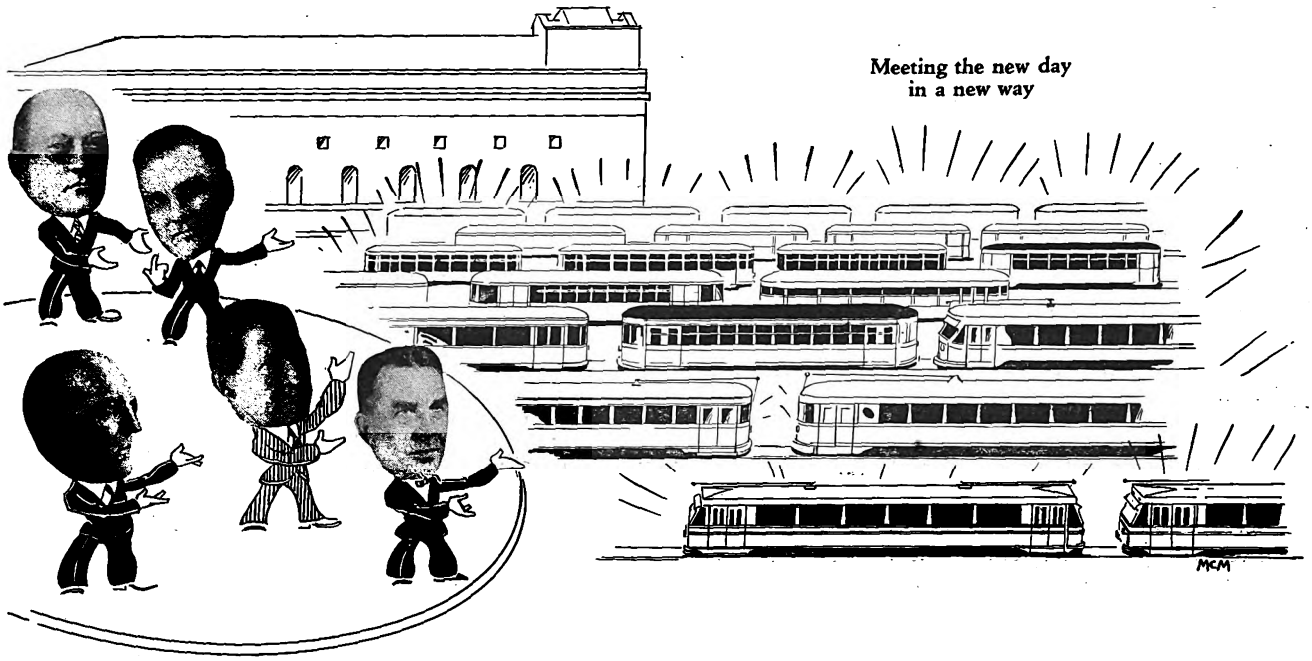

Meeting the new day in a new way

Only a Mint

Doesn't Need to Merchandise

There are no dusty answers here. A new day is being greeted in a new way by the railways in the work of finding the open sesame to the future

By G. J. MacMurray
News Editor *Electric Railway Journal*

KIN HUBBARD was all wrong. It's not so difficult to write a recommendation for some one you know. As a matter of fact, this industry is like the tea kettle. It may have been up to its neck in hot water, but it has continued to sing. And its song is not the song that *Liberty* thought it was. Nor is it by any means the song that Mr. Chrysler sang when he wrote "The Trolley Car Is Doomed" in *Collier's* for July 16. He and the others who have sprung to the bedside of the electric railways, fountain pens in hand, ready to write the obituary of this industry are to be forgiven for their absurdities. They need to be reminded that a shrill note from the whistle of a peanut wagon can always be counted upon to cause a stream of people to turn their heads as they rush along the street.

Returning to a study of this industry after a year's vacation, my curiosity was at first mild, but after I'd looked over statistics put out by Messrs. Storrs, Murphy and Dell, had sat down with Mr. Wickwire's little brochure "The Autobiography of a Thin Dime," read the speeches made at Cleveland and gone through 2,342 pages of the JOURNAL for 1927 the matter became scientific and intense. So, scientific and intense we are for the moment.

The revenue passengers carried during the first nine months of 1927 by 217 companies which report monthly to the American Electric Railway Association vary from 1.44 per cent increase in January to 3.85 decrease in July. For the whole nine months there is a decrease of 0.7 per cent.

Prof. Albert S. Richey's figures for street railway fares and electric railway materials and wages appear elsewhere in this issue. The fare tendency has been upward in recognition of good service, the national average being 8 cents. Some 116 major cities in the United States have a 10-cent cash fare. This group represents a large majority of the nation's mileage.

As if that were not enough in the way of figures to give this recital an authoritative touch, Freddie Dell, whose diet is figures, "conventionally speaking," supplied the statement on the next page just before he left on Jan. 3 for a vacation in Havana.

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These are merely high spots. They are almost as succinct as the reply of the little boy at school who when asked to tell who Patrick Henry was and what he did, replied that "Patrick Henry was a young man and he lived in Virginia. He had blue eyes and light hair. He was married, and he said: 'Give me liberty or give me death.'"

The Biggest Room Is the Room for Improvement

Well, anyway, the electric railways are finding out that the biggest room in the world is the room for improvement. It is not all sunshine and roses, but the best news is that many properties, small as well as large, with few exceptions are coming back. Look at the moderate-sized properties, other than Grand Rapids, which entered the contest for the Coffin Award. Consider Little Rock! Take a look at Durham! St. Louis came out of receivership. The Chicago, North Shore & Milwaukee Railroad again hung up new records. In Chicago 1,574,969,902 people rode the Surface Lines in a year. As for the reorganized Cincinnati, Hamilton & Dayton road, the balance remaining for that property after fixed charges and depreciation was 55 per cent in excess of the estimates made by the reorganization committee. Pittsburgh also did well despite a decrease of $113,998 in gross earnings for the year due to the economic situation there.

Money Is a Boomerang; Turn It Loose

Best of all, the electric railways are learning that money is a boomerang. To go over all rehabilitation programs would be impossible. Aside from the program of the New Haven for its Springfield and Worcester properties, there was the rehabilitation of the South Shore Line, the completion of the $4,000,000 job of electrifying the Bay Ridge division of the Long Island Railroad, the $1,500,000 expenditure of the Cincinnati, Hamilton & Dayton Railway, the extensive program of the Cincinnati Street Railway, the $175,000 cut-off of the Milwaukee Electric Railway & Light Company, the work on the properties at Norfolk and Williamsport and the $680,000 program at Minneapolis, not forgetting the $3,000,000 program for Kansas City, all in the way of special expenditures. Certainly no shop installation exceeded in magnitude that of the B.-M. T.

The instances cited do not, of course, run the gamut of all the work done, but they indicate the willingness of the companies to spend money in order to make it. Detroit will not get its downtown dips, but there is no telling about the billion dollar plan of Henry A. Blair to develop and co-ordinate the surface cars, elevated lines and buses in Chicago. The new plan of rapid transit in northern New Jersey has been advanced, and co-ordination has been recommended for St. Louis and rapid transit for Cincinnati under the Beeler plan. Engineer Smith sees waste in the building of city-owned lines in New York City and suggests a fare increase with a unified system, but Samuel Untermyer wants New York City to recapture the lines built with city money but privately operated so as to tie them into the new lines being built by the city. In the matter of transit Mayor Walker and Comptroller Berry have stopped calling each other names.

Some progress has been made on the plan to have the Public Service Company of New Jersey use the old canal bed in Newark. The $12,000,000 Dorchester Rapid Transit extension at Boston was placed in service and Rochester's new rapid transit line was opened. Again, at Boston there was unusual interest in the plan of the Wells interests to take over and electrify the narrow-gage line. M. M. O'Shaughnessy, city engineer of San Francisco, told about the $3,500,000 expansion program for the municipal system with track extensions totaling 11.6 route-miles and 47 additional cars and 26 buses. J. Rowland Bibbins contributes to the history of the year with his article "Problems of Mass Transportation" in the issue for April 23 and with his recommendations for Philadelphia. Also in Philadelphia Expert Simmons advised an agreement for Broad Street tube operation only and Dr. Snow suggested the expenditure of $77,000,000. The program of the Piedmont & Northern for carrying out its $50,000,000 expenditure has been frowned upon by the I. C. C. examiners, but that case is not yet off the docket.

Municipal Operation No Panacea

San Francisco's municipal road is having hard sledding and Seattle doesn't seem to know whether it is coming or going. As for the Detroit Municipal system, it is in the cards that something heroic in the way of fare changes must be done soon.

In Chicago political bickering prevented the consummation of a new franchise deal and the whole matter is again the subject of conferences. One cannot pass the wonderful record of the Surface Lines without mentioning that the men there, comprising the largest labor local in the industry, reminded fellow unionists of other trades that nothing was to be gained by idle baiting of the railways.

Kansas City got a new franchise, but the situation in Toledo is still unsettled. The value of the St. Louis properties has been fixed at $58,157,236 and the company has come out of receivership, but the franchise matter remains to be settled. The question of renewing the Boston Elevated agreement for operation under public control is now before the Legislature.

Note the "Axe" in Taxes

Among the paving relief measures was the one passed in New Jersey. The issues it was expected the so-called O'Fallon case would settle still remain undecided, but as William A. Prendergast of the New York State Commission pointed out in a paper before the annual convention of the Railroad and Utility Commissioners held in Dallas, Tex., the courts have ruled that the cost of reproduction shall be recognized as the present value and should be so accepted. The burden of taxation that the railways bear was made plain by Leslie

The Convention Record Reduced to Figures

Year	Convention City	Convention Registration	Number of Manufacturer Company Members	Number of Exhibitors at Convention	Total Space Sold, Square Feet
1916	Atlantic City	3,271	208	125	57,329
1917	New York	Conference only	171	No exhibit	No exhibit
1918	New York	Conference only	171	No exhibit	No exhibit
1919	Atlantic City	3,166	206	157	62,219
1920	Atlantic City	3,300	200	136	59,529
1921	Atlantic City	1,189	225	No exhibit	No exhibit
1922	Chicago	4,200	244	141	61,895
1923	Atlantic City	4,404	274	162	75,681
1924	Atlantic City	5,804	330	192	86,349
1925	Atlantic City	7,147	371	204	100,030
1926	Cleveland	8,623	423	271	114,797
1927	Cleveland	8,024	445	293	116,634

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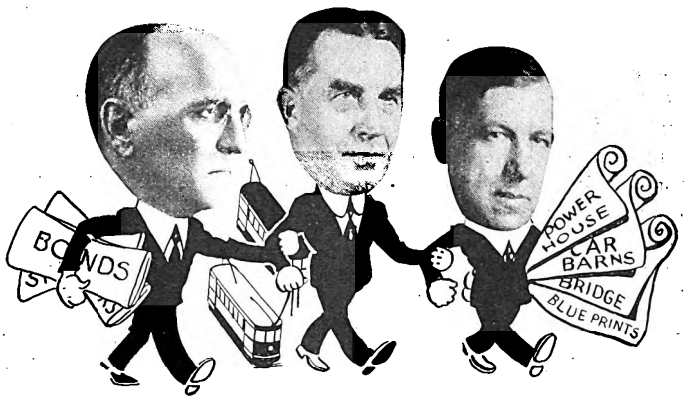
Vickers, economist of the association, at the hearing in Washington before the ways and means committee, in which he brought out the fact that one cent of revenue out of every ten of the railways goes for taxes. This recalls the fact that every evil contains the germs of its own destruction.

The year closed with Sam Greenland responsible operating head of the system in St. Louis and Jack Shannahan at Omaha, with the problem facing him of securing a new franchise and restoring to popular favor a road that has long been the goat for local politicians. Mr. Sawyer joined Stevens & Wood under an arrangement that gives him wider scope for the exercise of his talents and fortifies that firm by the accession to its forces of a man unusually well equipped as a utility expert.



A smooth-working triumvirate

Soothing the Passengers' Nerves

As for the technical arts, this review is not intended to cover them. Suffice it to say that the improvement of cars still holds its place in the limelight. The bumps are being taken out of track on a wholesale scale and the battle between wood and steel for ties goes merrily along in the competition to give the passenger a smoother ride. If the process of soothing the passenger to relaxation continues, we shall next be faced with the need for alarm clocks to wake them when they reach their corners. There appears to be much interest in the automatic rectifier substation, noise prevention and our old friend rail corrugation. Pull-ins are still being pulled down and better snow-fighting methods are preventing hold-ups of service. No longer is it true of service that the man who decided to commit suicide by lying on the track starved to death before the car came along.

The Journal spurred writers on by its Maintenance Article Contest and preached amusing sermons by its cartoon, "Adventures of Old Man Trouble of the Hicksville Railway," while the writer of the Dick Prescott sketches appears to be just as prolific as ever. Moreover, there was the notable series of articles on foreign practices written by Henry W. Blake, which served to expand the limits of electric railway thinking beyond our own shores.

In equipment there have been corresponding improvements, and in city service, where $1\frac{1}{2}$ to $1\frac{3}{4}$ m.p.h.p.s. used to be considered good acceleration, motors capable of giving 3 m.p.h.p.s. are thought desirable. The earliest radical departures in equipment were in the construction of cars for the Springfield Street Railway and by the Chicago & Joliet Electric Railway with worm-gear drive. At the Cleveland show there blossomed forth an array of new ideas in cars, trucks, buses and equipment that jolted the industry to a sudden realization of the speed at which we are moving. Thus through a gradual process of evolution transportation has entered the product class along with soap and candy. The public, ever receptive to something good, is beginning to have its attention directed to transportation as a product highly satisfactory from the standpoint of economy, convenience and comfort.

Newspaper advertisements show the great advance in thinking that is being made in the direction of selling the service of electric railways. Many of these efforts had strong rider appeal; others were directed to the consideration of economy in railway riding. But the important thing is that the copy is being written to sell a product. Just as the production of an artistic poster presupposed the hiring of a real artist, so electric railways are coming to see the need for advertising copy writers with skill, imagination and understanding of crowd psychology. As Fred Erickson, advertising manager of the Milwaukee Electric Railway & Light Company, puts the railway advertising story, "Keep on telling it in such a manner that the public knows about it and believes it. That is the secret back of advertising the transportation business." Still, some men in the railway business are as obdurate about the value of advertising as was the jeweler who did not wake up to the fact that advertising brings results until he advertised for a watchman and discovered the morning after the ad had been run that his shop had been ransacked by burglars.

Omaha gave Mr. Shannahan a royal reception

Ride the Trolley Week

In Pittsburgh ride merchandising has developed a wide range of ingenuity, extending from cut rate and special short fares to the inauguration of a "ride the trolley" week. So well have they done their work

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there that a story comes from Pittsburgh that a flapper rode the cars all day because she misinterpreted a dash sign which read "The Loves of Carmen."

The importance of the movie in advertising railway service is evidenced by the activity of the American Electric Railway Association in arranging for the preparation and national distribution of ride-selling films. Of course no such stars as Greta Garbo and John Gilbert are to be shown unless perhaps they wish to indorse a de luxe safety car in preference to a Rolls Royce. How effective an advertising medium the movie really is was proved in Providence, R. I., recently when many people crashed the gate to see the picture "East Side, West Side, All Around the Town," presented by the railway. This ingenious version of the plight of the private automobile owner reminded one of Eugene Field's line about the German railroad train: "Fool that I was, I should have walked; I had no time to waste."

Trainmen Develop Potential Riders Into Actual Customers

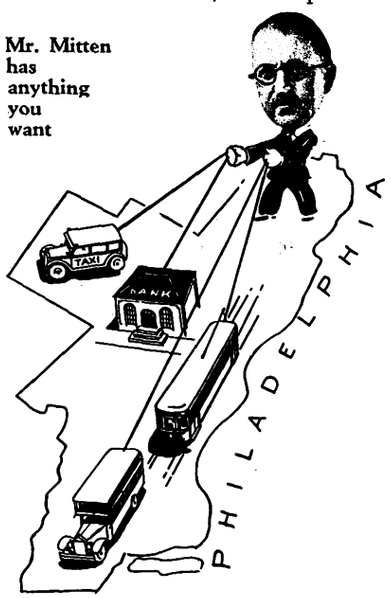
Now these things are not inconsequential. Service must be sold and sold again. As a writer recently put it in the little poem "Secret of Service":

> We may lay a splendid trackway,
> We may build the finest cars,
> Install the best equipment
> To eliminate the "jars."
> We may furnish every comfort
> that the mind of man conceives;
> Even issue scented transfers
> On æsthetic gilt-edged leaves,
> But to give you all real service,
> That is service with a "throb,"
> We must look to our street carmen
> To be always on the job.

In the final analysis, trainmen are largely responsible for developing potential riders into actual customers. Prospect cards were resorted to by the Pacific Electric Railway, Winnipeg Electric Company and Elmira property whereby employees directly solicited new business. The thousand and one little touches that appeal to customers were pretty broadly employed by the various railway properties. In Evansville the company followed the practice used by Grand Rapids, Atlanta, Knoxville and other cities of naming the cars after the first settlers. In Cincinnati new insignia appeared on all the cars. An open house was held in Williamsport, Pa., and carnations were distributed to the ladies.

On this subject of actual customers Mr. Lemmon, of Stone & Webster, said: "Unless we know more about the other fellow's needs than he does and can point them out to him there is no reason to suppose that he will part with real money until he has become aware of his requirements."

Whether the utility plan of advertising included entertaining the Prince of Wales, as the International Railway did in Buffalo, or engaging an English economist to look into the inner workings of the employee ownership scheme existent in Philadelphia, or whether it was a trick of showmanship like the bonfire and civic celebration with which the Cincinnati, Hamilton & Dayton Railway introduced its new service, it is impossible



for this commentator to say. Long before the Coffin Award was to be made car riders in Grand Rapids knew that their vicinity was vying for honors with other cities throughout the country; civic pride was, therefore, aroused, and they awaited the outcome of the competition just as thousands awaited the new Ford model.

Progress With the Bus

Speaking statistically again, the Public Service Corporation of New Jersey holds the record for passengers handled on buses. On that system in 1926 199,640,564 passengers were carried by bus, compared with 397,690,310 passengers transported by trolley. Perhaps one of the most important bus developments of the year was the use of the bus for local hauls and the trolleys for long hauls in Detroit. This is an experiment that has attracted wide attention. And don't forget that T. E. Mitten had something very worth while to say during 1927 in his interview, "Three Classes of Service."

In New York City the Board of Estimate granted a number of franchises for the operation of buses, but the grants have still to be certified as to their conveniences and necessity by the Transit Commission. Among the de luxe and sightseeing tours were those started by the Cincinnati Street Railway. The Twin City Rapid Transit Company went into the taxicab business in January. One of the most important situations to be righted during the year was at Indianapolis, in which city the Indianapolis Street Railway took over the Peoples Motor Bus Company.

Many Sterling Papers Presented at Meetings

The palm for papers on bus operation goes to R. N. Graham for his excellent presentation before the Metropolitan Section, Society of Automotive Engineers. Close behind Mr. Graham in the importance of the papers presented on this subject came A. J. Brosseau, with his address at the meeting of the Bus Division of the American Automobile Association in Philadelphia; Clark T. McConnell, B. W. Arnold and Mr. Noonan of Pittsburgh.

There was certainly no dearth of good papers at the meetings during the year. It is not extravagant to say that the Cleveland convention was the most fruitful one yet held, but at all the sectional meetings, with possibly one exception, the spirit reflected was the one that is putting the industry back on its feet. President Sawyer traveled the length and breadth of the land, and his remarks at the sectional meetings did much to bring home to his audiences the need for keeping everlastingly at the problem. As Mr. Sawyer repeatedly said, this is a new day, and as Charlie Gordon put it, "You Can't Sell Cotton Goods in a Silk Age." At the Oklahoma meeting Mr. Storrs said the fact that the industry has come back to render the excellent service that it does today proves conclusively the essentiality of it and also the measure of the men engaged in it.

Perhaps no year was more conspicuous than the past for the accomplishments in the development of de luxe equipment. The car of the future will no longer symbolize merely utility but rather utility plus art. Industrial art is fast reaching the plane of the Fine Arts. Witness the Kansas City Public Service Company adopting a color scheme for cars

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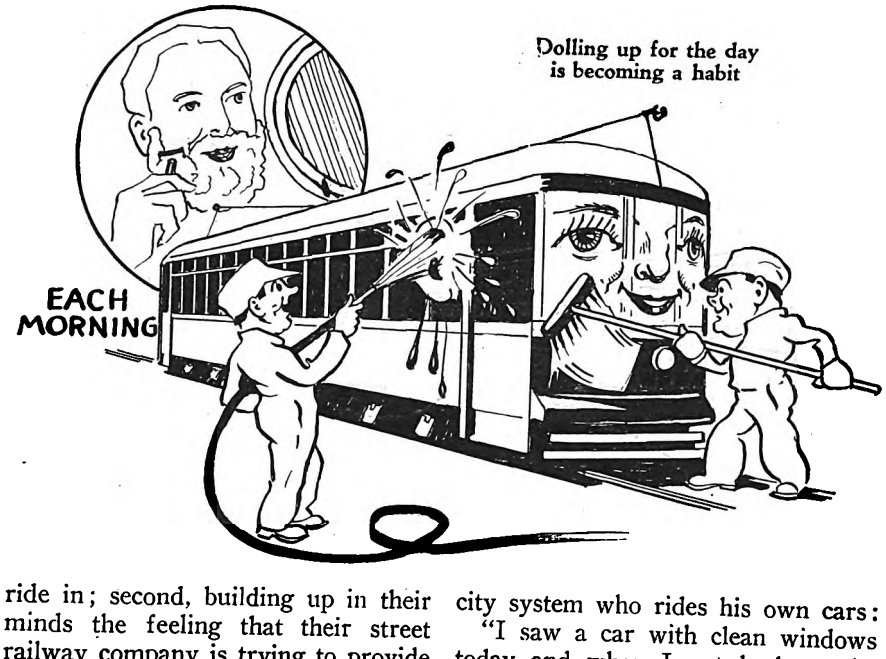
as submitted by the Municipal Art Commission. Imagine the residents of El Paso some years back gazing upon chrome yellow and Yale blue on their electric railway equipment. This super-decorative idea follows closely the psychology of the new Ford school of thinking, which is conscious of the general change in habits and ways of living and has come to believe that a vehicle that merely takes you there and back has long since outlived its usefulness and now must be replaced by a vehicle that takes you there and brings you back in style. Of course, extremes are to be expected. In that respect some of the cars are like the short skirt. They may be in bad taste, but they often show good form.



And so the trend runs. To recapitulate the record of new cars here there is no need. Suffice it to say that in Atlanta and other cities where car and general rehabilitation programs have been carried out the officers of the companies resorting to these means of keeping abreast of the times have not been disappointed with the amount of recognition such efforts have received at the hands of the regulatory and other public bodies. New equipment saved the Eastern Massachusetts Street Railway $1,528 per car a year. New equipment is also playing a big part in the comeback of the reorganized Cincinnati, Hamilton & Dayton Railway.

As H. G. Holtzclaw put it:

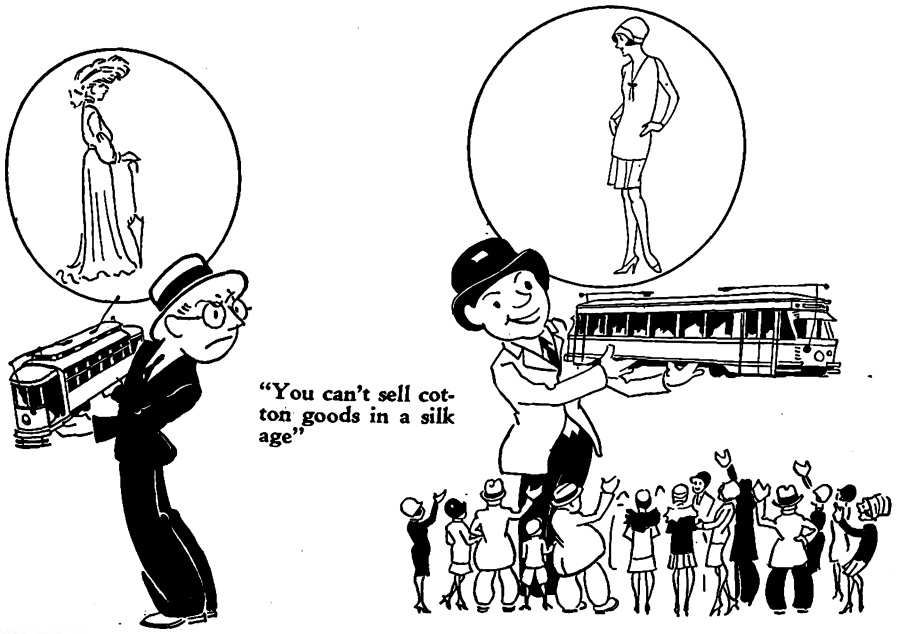
"We have two primary incentives for improvement—first, to get back some of the business which we have lost, by giving our patrons a clean, comfortable, attractive vehicle to ride in; second, building up in their minds the feeling that their street railway company is trying to provide the public with good facilities, the psychology of which is that when the time comes for you to ask the public to give you more revenue, you will meet with a ready response and a wholesome co-operation rather than the swift kick which has so often been the lot of the poor railway."

And it isn't so expensive to keep cars up, as Pierre V. C. See of the Northern Ohio Power & Light Company showed in his article "Keeping Cars Attractive at Small Cost" in the JOURNAL for June 11. Pittsburgh led the way in keeping cars clean and attractive at small cost by putting in automatic electric washing and scrubbing apparatus in its carhouses. All this effort to keep cars presentable is in strange contrast to the remark said to have been made not so long ago by the manager of quite a large city system who rides his own cars:

"I saw a car with clean windows today and when I got back to the office I raised hell to find out who cleaned the windows and spent all that money."

G. W. James, Jr., after a study of the electric railway car situation was moved to poetry in the Convention Daily and epitomized the car situation in the following lines:

Ten old street cars
Drawn up in a line;
Along came the treadle car
And then there were nine.
Nine bum street cars
On the siding wait;
Progress said "Streamline"
And then there were eight.
Eight old street cars,
Ought to be in heaven;
One fell to pieces
And then there were seven.
Seven old street cars,
One was full of nicks;
People wouldn't board it
And then there were six.
Six bum street cars,
Owners not alive;
One smashed through faulty brakes
And then there were five.
Five old street cars,
Hard slat seats of yore;
"Leather," "Plush" and "Kemi-suede"
And then there were four.
Four noisy street cars
As jumpy as a flea;
Along came the "worm drive"
And then there were three.
Three weighty street cars
Always lumbering through;
Some one cried "aluminum"
And then there were two.
Two shoddy street cars
Laughed at on the run;
Motor fell to pieces
And then there was one.
One punk street car,
Knew its day was done;
Some one yelled "piece of junk"
And then there was none.



Now, good transportation with suitable cars presupposes adequate fares. Houston, Buffalo and Atlanta were among the cities that went to a cash 10-cent fare, while Baltimore seeks

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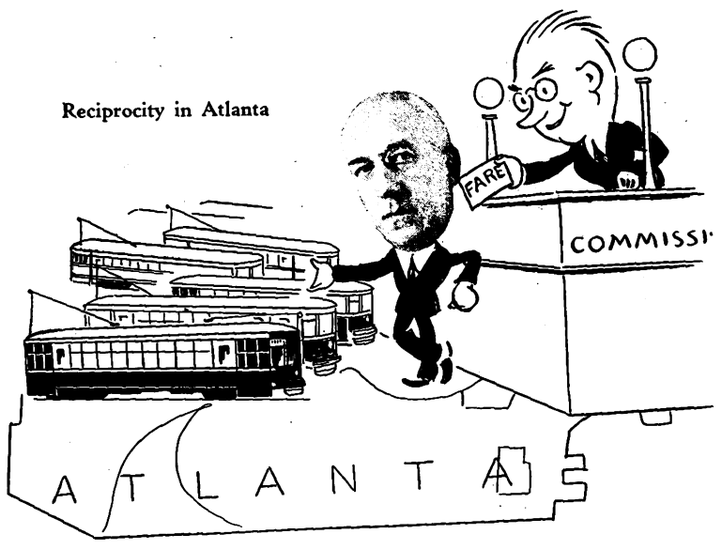


Reciprocity in Atlanta

that rate. The spread of the 10-cent fare idea is illustrated by the fact, noted before, that there are 116 cities of more than 25,000 population in the country with this basic rate.

No Vehicle Superior to Trolley

For moving large numbers of persons the superiority of the electric car remains undisturbed. Thus, a survey of traffic conditions in Chicago, made public in January, 1927, showed that of the 1,693,506 people riding in or out of the central business area 62.4 per cent used the street cars or elevated, 13.1 per cent the steam railroads, 5.3 per cent the buses and 19.2 per cent private automobiles. The details of the story gleaned from the traffic survey in Chicago were contained in several articles in the JOURNAL, the first of which was run in the issue for Jan. 8. The automobiles were responsible for more than seventeen times as many accidents as the street cars. In Detroit it was estimated that the annual economic loss through traffic congestion and delay is more than $30,000,000, and H. M. Gould points out that that city is less than 50 per cent efficient in the use of its streets.

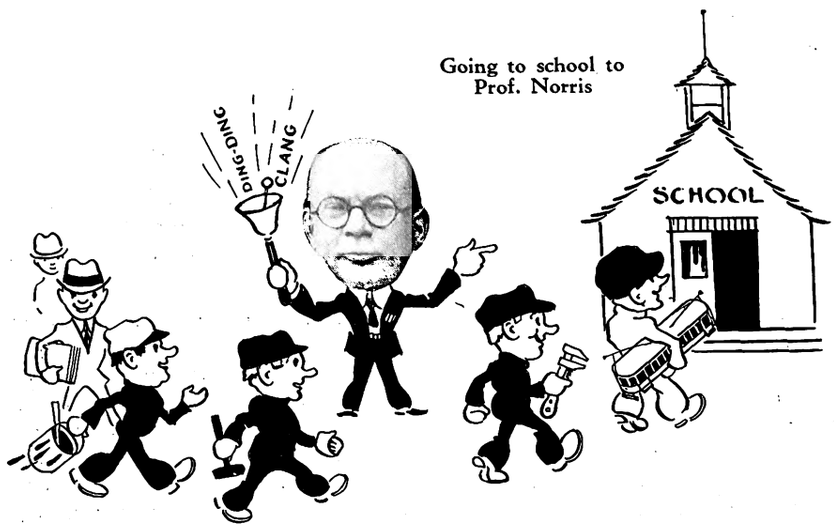
A Wise Old Gentleman Talks Safety

By means of slogans, safety campaigns, prizes and bonuses for no-accident records the men in the railway business and their managements are impressing riders and pedestrians alike with the need of an intelligent and sympathetic understanding of the safety movement. While Aunty Jay Walker was forbidding here and there, Mr. Will Livelong had stop-over privileges in Philadelphia for the month of April. Every agency, association and organization listened to this wise gentleman's admonitions on reducing accident hazards in the streets. New Orleans celebrated a 100 per cent safety day and the New York State Railways celebrated the fact that ten employees operated 240,000 miles without an accident. Chester K. Thomas of the Chicago, North Shore & Milwaukee Railroad advocated popularizing safety work. J. H. Handlon suggested studying safety more closely, particularly investigating the accident breeding habits of employees. The Monongahela West Penn Public Service Company decided during the year just ended to devote at least one page of *Courtesy and Service,* its official publication, to news of safety. In Brooklyn operators with no-accident records were awarded cash considerations as well as watches, and on many other properties there were prizes of one kind or another intended to make employees safety conscious in their daily duties. At all times the idea is to make the safety slogan short in preachment but long in practice.

But after all, safety, like merchandising, depends upon the interest, training and education of employees. Rapid progress is being made in equipping transportation men not only for their jobs but in getting more out of life. Bus operators in Akron, Ohio, are graduated *summa cum laude,* and 2,300 employees of the Philadelphia Rapid Transit Company enrolled in classes for practical instruction, while their leisure time is often spent among the 6,000 books and 150 periodicals of the company's library.

Education is handled intensively in Boston, where Professor Norris directs a program which includes courses in public speaking, fabric painting, events of the day, law and investing savings. Dr. Rowland, in Milwaukee, likewise is pointing the way to widened opportunity for utility employees through a variety of self-improvement courses.

After all, no industry can rise above the intelligence of the men who are engaged in it. As they sow, so is the industry of which they are a part. To go back to Mr. Chrysler, let it be said that something is brewing, but it isn't trouble, not at the present pace in the railway industry. All depends, of course, on where the emphasis is placed, like the skipper who wrote in the log, "The mate was drunk today." The mate said, "Is that necessary?" The captain responded, "It's true, isn't it?" "Yes," answered the mate. "Then it stands," replied the captain. Next day it was the mate's turn at the log and he wrote, "The captain was sober today." When the captain saw it he asked, "What did you put that in the record for?" The mate said, "It's true, isn't it?" "Yes," said the captain, "it's true, but—" "Then it stands," replied the mate.



Going to school to Prof. Norris

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Electric Railway

Costs and Fares in 1927

General commodity prices have dropped slightly during the year, followed by similar reductions in construction costs. Fares and wages show increases

By Albert S. Richey
Electric Railway Engineer, Worcester, Mass.

DURING the past several years, in its Financial and Corporate section, ELECTRIC RAILWAY JOURNAL has presented each month a series of index numbers compiled by the writer under the heading "Conspectus of Indexes." This conspectus is made up of indexes showing the trend of street railway fares and of the costs of electric railway wages and materials entering into electric railway operation; costs of construction, both electric railway and general; wholesale commodities in general; retail food; cost of living, and some others. In the Annual Statistical Numbers of the JOURNAL, the first issue in January each year beginning in 1923, charts and tables were presented showing the trend since 1913 of the most important of these indexes as affecting electric railway operation. In Fig. 7 herewith is shown a similar chart indicating the trend of five of these indexes from January, 1914, through the latest available figures for 1927. The indexes there shown are: (1) Wholesale prices of all commodities, as computed by the U. S. Bureau of Labor Statistics; (2) Electric Railway Construction Costs, as computed by the formula of the American Electric Railway Association; (3) Electric Railway Operating Materials Costs, including fuel for power; (4) Electric Railway Wages; (5) Street Railway Fares.

INDEX COMPUTED ON SAME BASIS AS IN PREVIOUS YEARS

The methods used in the computation of these five indexes were described fully on page 37 of the JOURNAL for Jan. 2, 1926, in an article which also contained a tabulation showing the numerical values of the various indexes monthly from January, 1920, through December, 1925. The earlier monthly numerical values, from January, 1914, through December, 1919, may be found on page 19 of the JOURNAL for Jan. 5, 1924. A tabulation herewith shows the numerical value of six of the indexes yearly from 1913 through 1927, and monthly beginning with January, 1925, and these six indexes also are shown graphically for the past three years on a somewhat larger scale than in Fig. 7 by the charts Figs. 1 to 6, inclusive.

FARES UP 2 PER CENT

The average street railway fare, as shown by Fig. 1, has increased during 1927 from 7.42 cents to 7.57 cents, an increase of 2 per cent during the year. Twenty-three of the 143 cities which affect this index reported increases in street railway fares during the year. The most important of these increases were in Buffalo, Syracuse, Rochester, New Bedford, St. Louis, Atlanta, Fort Worth, Houston and San Antonio. Other changes were of less importance as affecting the index, either on account of the smallness of the changes or the relatively small population involved.

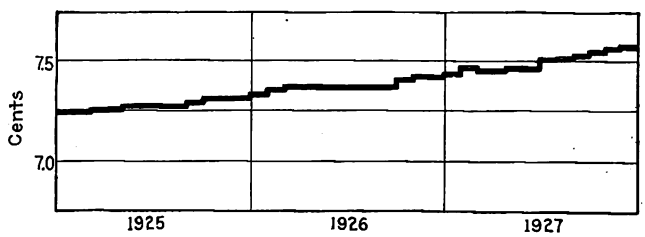

Fig. 1—Street Railway Fares (1913 = 4.8425 cents)

WAGES CONTINUE UPWARD TREND

The index of electric railway wages, as shown by Fig. 2, has continued its gradual upward trend which started in 1923. This index showed a slight increase in almost every month of 1927 and now stands at 228.4, with a total gain of not quite 1 per cent since December, 1926. The principal increases in wages of conductors, motormen and car operators have been in Virginia, Baltimore, New York City, Eastern Massachusetts, Indianapolis and Boston. The present index number of 228.4 is comparable with 100 in 1913, the peak of 232 in 1920, and the low point of about 207 in the early part of 1923. The increase in electric railway wages, amounting to 128.4 per cent since 1913, is still out of all proportion to the increase in cost of living, which according to the National Industrial Conference Board had increased only 64.2 per cent between 1914 and November, 1927. The average index of the cost of living during 1927 being about 164, and the average index of electric railway

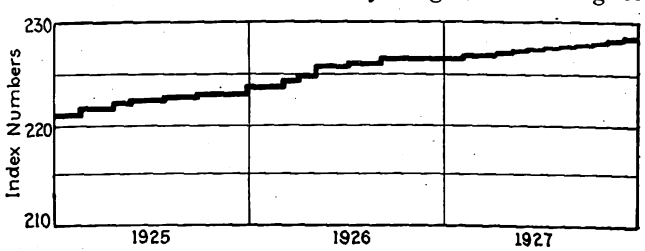

Fig. 2—Electric Railway Wages (1913 = 100)

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wages being about 227, the "real wages" of electric railway trainmen, as compared with 1913 and 1914, may be represented by an index number of 138, which is the index of wages divided by the index of the cost of living. In other words, the average electric railway trainman in the United States now has the opportunity to increase his standard of living 38 per cent over that of 1914. It may be remembered that a similar computation a year ago showed the index of "real wages" of electric railway trainmen as 134, compared with the present index of 138. This indicates an increase in the "real wages," or opportunity to increase the standard of living, of about 3 per cent during the past year. This has been due in part to a slight increase in wages, as before noted, but in a somewhat larger measure, it is due to a decline in living costs during the past year.

Materials Costs Decreased

The cost of electric railway operating materials declined somewhat during 1927, as is indicated by the index which is shown for the past three years in Fig. 3. This index, which in December, 1927, stood at 140.6, was then at its lowest since its 1920 peak. It should be borne in mind

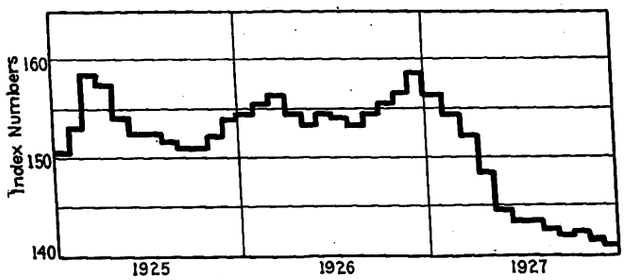

Fig. 3—Electric Railway Operating Materials (1913 = 100)

that in the make-up of this index, fuel for power enters into it with a weighting of 40 per cent. The decline of the index during 1927 was chiefly due to the falling off in fuel prices, although there were some recessions in its other elements.

Construction Costs Off Slightly

Electric railway construction costs showed a fairly steady falling off during 1927, with a slight gain in December, as is shown by Fig. 4. Compared with the average for 1926, 202.6, the index for December, 200.7, was about 1 per cent lower, and the average for 1927, 201.1, was three-quarters per cent lower. One of the principal constituents of this index is the common labor rate, which, according to *Engineering News-Record,* averaged 56 cents in the early part of the year, had declined to 54½ cents in October, and increased to 55 cents in December. The costs of various materials entering into electric railway construction, except those of steel rails and copper, also showed some decline during the year.

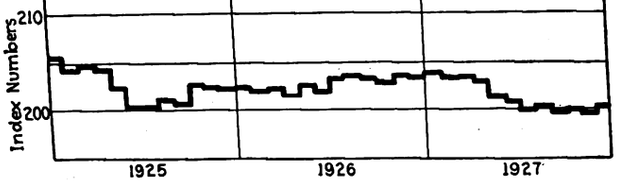

Fig. 4—A.E.R.A. Electric Railway Construction Cost Index (1913 = 100)

General construction costs, as indicated by the Construction Cost Index of *Engineering News-Record,* shown for the past three years in Fig. 5, showed a decline in 1928 somewhat greater than the Electric Railway Construction Cost Index. The various factors of structural steel, other building materials, and to a lesser extent common labor costs, which combined to bring down the Gen-

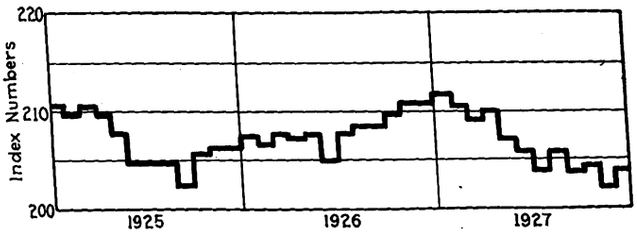

Fig. 5—"Engineering News-Record" Construction Cost Index (1913 = 100)

eral Construction Cost Index during the year, were practically the same as those which caused a similar effect in the Electric Railway Construction Cost Index. The latter, however, is stabilized somewhat by the heavier weighting of steel rail, the price of which has remained constant at $43 per ton since October, 1922, and also by the very much heavier weighting of the common labor item, which, as has been noted, showed a net decline of less than 2 per cent during the year.

Wholesale Commodities Down

The Wholesale Commodity Index of the U. S. Bureau of Labor Statistics is shown for the past three years in its revised form in Fig. 6. This index, which previously had been calculated on the base of 1913 = 100, was discontinued on that base in August, 1927, and since then it has been shown as revised to a base of 1926 = 100. The revision also included an increase in the number of commodities included (from 404 to 550), and the adoption of a weighting somewhat different from that previously employed. With these changes, the Bureau of Labor Statistics has published the revised index numbers

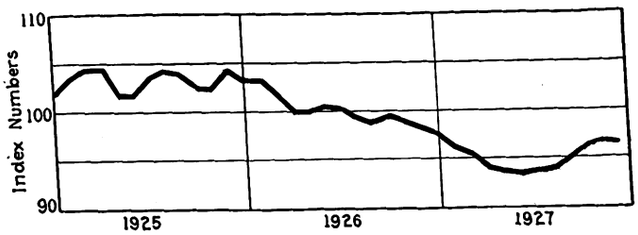

Fig. 6—Index of U. S. Bureau of Labor Statistics Wholesale Commodities (1926 = 100)

beginning with January, 1923, and these are shown in the line marked 1A on Fig. 7. The former series, ending in August, 1927, has been retained as line 1 in Fig. 7 and also in the accompanying tabulation, on account of its value in comparisons back through the years to 1913 and 1914 representing pre-war conditions. The Bureau states that it has in preparation a calculation of the revised index numbers which will carry them back to January, 1913, but until these calculations are made public it will be necessary to use the former series as here presented for such comparisons with years preceding 1923. Because a number of new commodities have been added to the series and others dropped, and the weighting of the various commodities has been changed, it is not possible accurately to join the revised series on to the

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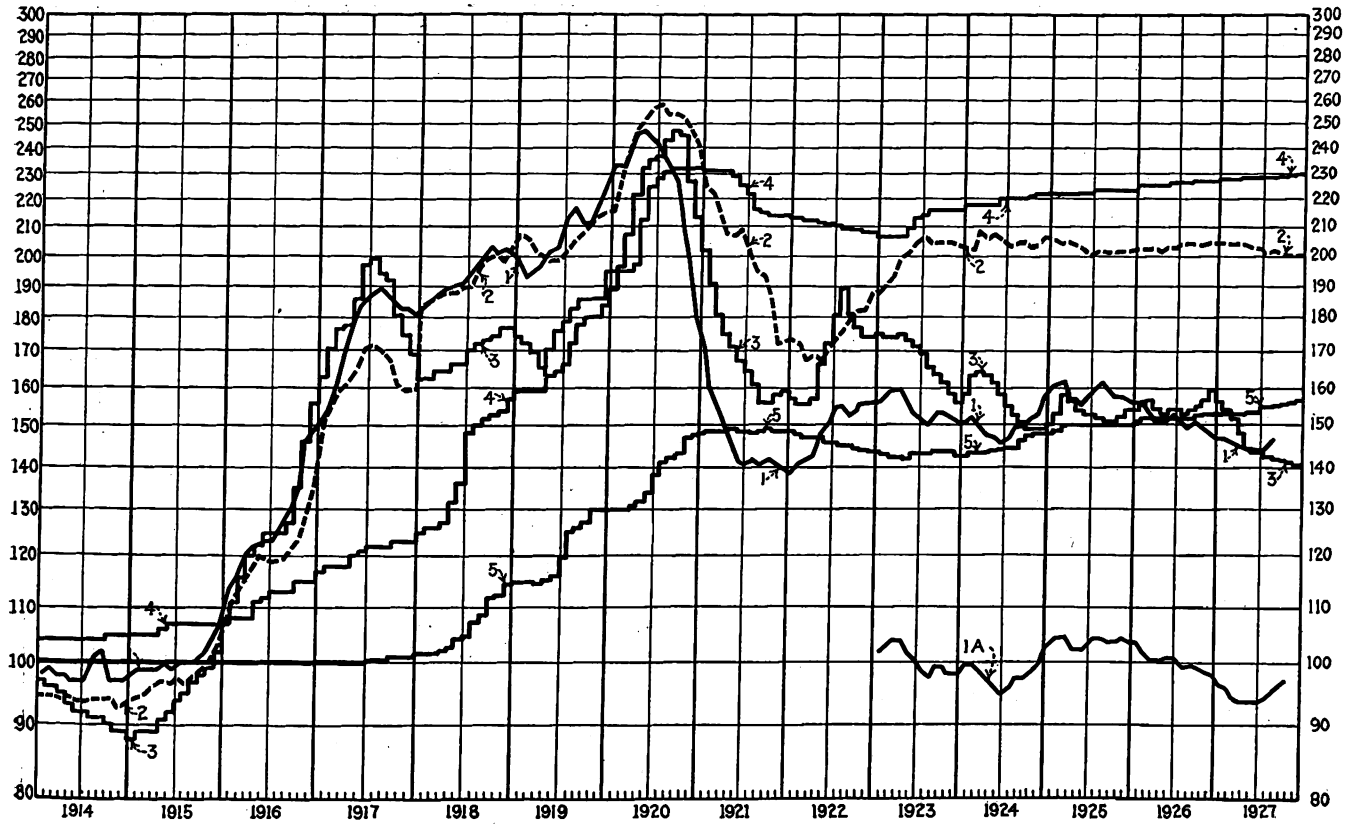

Fig. 7—Trend of Construction Costs, Wages and Fares 1913-1927 (1913 = 100)

1. Wholesale prices all commodities (U. S. Bureau of Labor Statistics).

1A. Wholesale prices all commodities (U. S. Bureau of Labor Statistics revision on base 1926 = 100). See text for comparison with curve 1.

2. Electric railway construction costs (American Electric Railway Association).

3. Electric railway operating materials costs (Richey). Includes fuel for power; weighted according to average use in maintenance and operation.

4. Electric railway wages (Richey). Maximum hourly wages of platform men, weighted according to number of men.

5. Street railway fares (Richey). U. S. cities (except New York); weighted according to population.

	Street Railway Fares (Richey)	Elec. Ry. Operating Materials Costs (Richey)	Electric Railway Wages (Richey)	Elec. Ry. Construction Costs (Am. Elec. Ry. Assn.)	General Construction Costs (*Eng. News-Record*)	Wholesale Prices, All Commodities (U.S. Bur. Lab. Stat.)
1913 aver...	100.0	100.0	100.0	100.0	100.0	100.0
1914 aver...	100.0	92.6	104.2	94.0	88.6	98.1
1915 aver...	100.1	93.5	106.2	97.3	92.6	100.8
1916 aver...	100.1	126.2	111.6	119.8	129.6	126.8
1917 aver...	100.5	181.9	120.6	162.7	181.2	177.2
1918 aver...	106.2	168.8	140.5	192.5	189.2	194.3
1919 aver...	120.7	172.2	174.0	205.1	198.4	206.4
1920 aver...	137.2	224.6	217.3	244.7	251.3	226.2
1921 aver...	148.9	169.9	222.7	200.7	201.8	146.9
1912 aver...	146.0	170.0	210.0	175.2	174.4	148.8
1923 aver...	142.9	168.0	212.1	200.2	214.1	153.7
1924 aver...	149.2	156.0	219.2	204.6	215.4	149.7
1925 aver...	150.2	153.1	222.2	202.4	206.7	158.7
1926 aver...	152.2	155.0	225.3	202.6	208.0	151.0
1927 aver...	154.6	145.7	227.5	201.1	206.2	.....
1925						
January....	149.6	150.3	221.0	205.3	210.4	160.0
February...	149.6	153.1	221.0	203.9	209.7	160.6
March.....	149.9	158.4	221.5	204.4	210.2	161.0
April.....	150.0	157.3	221.6	204.1	209.5	156.2
May.....	150.0	153.9	222.2	202.0	207.2	155.2
June.....	150.0	152.4	222.4	200.0	204.6	157.4
July.....	150.2	152.6	222.5	200.1	204.6	159.9
August.....	150.3	151.6	222.6	201.0	204.6	160.4
September..	150.6	150.9	222.7	200.5	202.1	159.7
October....	151.0	150.9	222.8	202.7	205.3	157.6
November..	150.7	152.0	222.8	202.4	205.9	157.7
December..	150.7	153.9	223.0	202.2	205.9	156.2

	Street Railway Fares (Richey)	Elec. Ry. Operating Materials Costs (Richey)	Electric Railway Wages (Richey)	Elec. Ry. Construction Costs (Am. Elec. Ry. Assn.)	General Construction Costs (*Eng. News-Record*)	Wholesale Prices, All Commodities (U.S. Bur. Lab. Stat.)
1926						
January....	151.2	154.3	223.8	202.2	207.1	156.0
February...	151.8	155.3	223.8	201.9	206.5	155.0
March.....	151.9	156.4	224.1	202.0	207.6	151.5
April.....	151.9	154.2	224.7	201.3	207.0	151.1
May.....	151.9	153.1	225.4	202.4	207.3	151.7
June.....	152.1	154.4	225.5	201.9	204.8	152.3
July.....	152.0	154.1	225.7	203.2	207.8	150.7
August.....	152.0	153.1	225.9	203.6	208.3	149.2
September..	152.0	154.2	226.1	203.2	208.3	150.5
October....	152.8	155.4	226.2	202.9	209.8	149.7
November..	153.2	156.6	226.3	203.7	210.8	148.1
December..	153.2	159.2	226.3	203.2	210.8	147.2
1927						
January....	153.2	156.0	226.6	203.5	211.5	146.9
February...	153.8	154.0	226.7	202.9	210.2	146.4
March.....	153.4	152.1	226.7	203.0	208.8	145.3
April.....	153.4	148.0	226.9	202.6	209.0	144.2
May.....	153.6	144.2	227.4	201.0	206.8	144.1
June.....	153.6	143.0	227.5	200.6	205.6	143.7
July.....	155.2	142.9	227.8	199.9	203.7	144.6
August.....	155.3	142.1	227.9	200.9	205.5	146.6
September..	155.5	141.6	228.0	199.4	203.6	(Base
October....	155.7	141.8	228.2	199.8	204.4	changed
November..	156.1	141.3	228.3	199.4	202.0	after
December..	156.2	140.6	228.4	200.7	203.9	August)

old by the application of a multiplying factor. From January, 1923, to December, 1925, and from January through August, 1927, during which periods both the old and new index numbers are available, the relation between the two seems to be about 1.53. The old series index number for the year 1926, however, was 151, and as the new series is on the base of 1926 = 100, this would indicate a relation of 1.51 between the two series. This indicates that an attempt to extend the old series forward or the new series backward by the use of a simple multiplier is likely to result in an error in the nature of 1 or 2 per cent.

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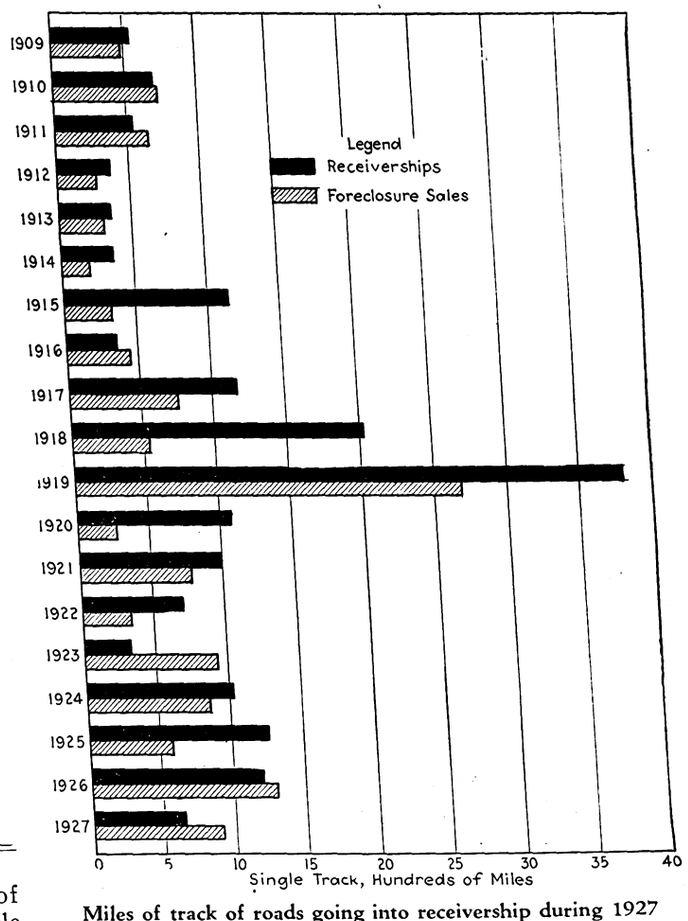
Receiverships Reduced in 1927

With the exception of one year, the mileage of companies going into the courts was less than in any year since 1916. Many properties have been returned to their owners

GREATER stability of the industry than for a number of years is indicated from a study of the receivership record for 1927. For the first time since 1923 not one company of major importance was thrown into the courts. Only two companies with more than 100 miles of track were included in the list of new receiverships. These were the Chicago, South Bend & Northern Indiana Railway and the Des Moines City Railway. Contrasted with this, the United Railways of St. Louis, with more than 450 miles of track, was able to have its affairs straightened out and be discharged from the custody of the courts.

Mileage of electric railways in receivership on Jan. 1, 1928, showed a decrease of almost 13 per cent under Jan. 1, 1927. Seventeen companies, comprising 1,099 miles of track, emerged from receivership during the year. Thirteen companies, involving 624 miles of track,



Miles of track of roads going into receivership during 1927 were about half as many as in 1926

Table I—Electric Railway Receiverships—1927

	Miles of Single Track Involved	Outstanding Securities—Stock	Bonds	Receivers' Certificates
Murphysboro & Southern Illinois Electric R.R., Murphysboro, Ill.	11.00	400,000	2,269,550	None
Chicago, South Bend & Northern Indiana Ry., South Bend, Ind.	125.00	$7,500,000	$4,955,500	None
Evansville & Ohio Valley Ry. Evansville, Ind.	70.00	511,985	1,960,900	None
Des Moines City Ry., Des Moines, Iowa	103.24	3,019,100	4,821,000	None
Union Traction Co., Coffeyville, Kan.	85.00	700,000	1,150,000	None
Grandview R.R., St. Louis, Mo.	15.00	(a)	(a)	(a)
Hannibal Railway & Electric Co., Hannibal, Mo.	6.50	111,165	102,500	None
Eighth & Ninth Avenues Ry., New York, N. Y.	37.27	232,000*	None	None
Empire State R.R., Syracuse, N. Y.	70.00	2,950,000	2,750,000	None
Cincinnati, Georgetown & Portsmouth R.R., Cincinnati, Ohio	54.00	1,500,000	1,000,000	None
Lawton Railway & Light Co., Lawton, Okla.	6.31	100,000	100,000	None
Pennsylvania & Maryland Street Ry., Meyersdale, Pa.	7.00	190,800	216,000	None
Schuylkill Ry., Girardville, Pa.	34.00	400,000	1,550,000	None
Total for 1927	624.32	17,615,050	20,875,450	None

* 58,000 shares. No par value. Based on market quotation.
(a) Information not available.

Table II—Record of Electric Railway Receiverships

Year	Number of Companies	Miles of Single Track Involved	Outstanding Securities—Stocks	Bonds
1909	22	558.00	$29,962,200	$22,325,000
1910	11	696.61	12,629,400	75,490,735
1911	19	518.90	29,533,450	38,973,293
1912	26	373.58	20,410,700	11,133,800
1913	18	342.84	31,006,900	47,272,200
1914	10	362.39	35,562,550	19,050,460
1915	27	1,152.10	40,298,050	39,372,375
1916	15	359.26	14,476,600	10,849,200
1917	21	1,177.32	33,918,725	33,778,400
1918	29	2,017.61	92,130,388	163,257,102
1919	48	3,781.12	321,259,354	312,915,104
1920	19	1,065.31	28,758,455	72,283,575
1921	19	986.42	32,909,525	36,177,800
1922	14	695.43	18,140,150	20,304,400
1923	12	333.63	8,332,100	14,707,066
1924	12	1,021.88	28,489,700	35,716,000
1925	14	1,260.07	51,383,195	54,696,525
1926	16	1,228.28	17,769,435	117,560,073
1927	13	624.32	17,615.050	20,875,450

Table III—Record of Electric Railway Foreclosure Sales

Year	Number of Companies	Miles of Track Involved	Outstanding Securities—Stocks	Bonds	Receivers' Certificates
1909	21	488.00	$22,265,700	$21,174,000	(a)
1910	22	724.36	19,106,613	26,374,075	(a)
1911	25	660.72	91,354,800	115,092,750	(a)
1912	18	267.18	14,197,300	10,685,250	(a)
1913	17	302.28	15,243,700	19,094,500	(a)
1914	11	181.26	26,239,700	44,094,241	(a)
1915	19	308.31	30,508,817	16,759,997	(a)
1916	19	430.14	13,895,400	22,702,300	(a)
1917	26	745.19	27,281,900	27,313,045	(a)
1918	23	524.22	37,740,325	20,149,384	(a)
1919	29	2,675.48	89,893,400	79,836,738	$42,300
1920	13	259.90	7,782,400	11,227,328	52,000
1921	13	777.97	33,642,255	30,863,526	5,000
1922	13	322.88	7,491,500	12,640,600	114,683
1923	15	927.45	118,077,959	110,638,250	12,265,000
1924	14	869.25	21,022,800	34,845,535	3,440,388
1925	13	569.39	18,074,300	18,329,555	53,000
1926	28	1,291.17	20,054,700	57,340,363	214,000
1927	16	940.68	53,345,000	78,445,100	3,140,000

(a) Data not available.

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Table IV—Electric Railway Receiverships as of Dec. 31, 1927

DISTRICT OF COLUMBIA	Year of Receivership	Miles of Single Track	Capital Stock	Funded Debt	Receivers' Certificates
Washington-Virginia Ry. (1)	1923	40.00	$2,378,300	$5,614,000	None
ILLINOIS					
Chicago & Interurban Traction Co., Chicago (2)	1922	50.00	1,000,000	1,816,000	None
Chicago Railways, Chicago	1926	597.06	100,000	103,854,255	None
Peoria Railway Terminal Co., Peoria (3)	1922	25.28	1,000,000	2,444,000	None
INDIANA					
Chicago, South Bend & Northern Indiana Ry., South Bend	1927	125.00	7,500,000	4,955,500	None
Evansville & Ohio Valley Ry., Evansville	1927	70.00	511,985	1,960,900	None
Indianapolis & Cincinnati Traction Co., Indianapolis (4)	1925	101.00	3,600,000	2,600,000	$156,000
Union Traction Co. of Indiana, Anderson	1924	445.50	11,500,000	15,183,000	None
IOWA					
Des Moines City Ry., Des Moines	1927	103.24	3,019,100	4,821,000	None
Mississippi Valley Electric Co., Iowa City	1926	6.00	592,835	184,500	None
KANSAS					
Joplin & Pittsburg Ry., Pittsburg	1924	94.52	7,000,000	3,078,500	None
Union Traction Co., Coffeyville	1927	85.00	700,000	1,500,000	None
KENTUCKY					
Owensboro City R.R., Owensboro	1923	12.50	75,000	400,000	None
MASSACHUSETTS					
Milford, Attleboro & Woonsocket Street Ry., Springfield (5)	1924	29.73	315,000	300,000	None
Milford & Uxbridge Street Ry., Milford	1925	35.00	540,000	500,000	None
MICHIGAN					
Detroit United Ry., Detroit	1925	613.89	15,375,000	29,745,500	None
Grand Rapids, Grand Haven & Muskegon Ry., Grand Rapids	1926	44.09	1,200,000	1,500,000	None
Houghton County Traction Co., Houghton	1921	32.15	957,200	660,000	None
Michigan Railroad Co., Jackson	1924	156.71	4,000,000	8,050,000	None
MINNESOTA					
Minneapolis, Anoka & Cuyuna Range Ry., Minneapolis (6)	1926	29.25	300,000	284,000	None
St. Paul Southern Electric Ry., Hastings	1918	17.54	658,225	364,900	12,150
Wahpeton-Breckenridge St. Ry., Breckenridge	1925	1.00	42,500	None	None
MISSOURI					
Hannibal Railway & Electric Co., Hannibal	1927	6.50	111,165	102,500	None
Kansas City, Lawrence & Topeka R.R., Kansas City (2)	1919	12.00	250,000	400,000	None
Southwest Missouri R.R., Webb City	1926	90.00	5,000,000	2,341,000	None
MONTANA					
Helena Light & Railway Co., Helena (7)	1925	18.50	935,000	878,000	None
NEW JERSEY					
Morris County Traction Co., Morristown (1)	1923	68.98	300,000	4,179,000	25,000
NEW YORK					
Binghamton Ry., Binghamton (4)	1925	47.72	978,895	2,807,200	None
Brooklyn Heights R.R., Brooklyn	1919	5.10	200,000	250,000	None
Buffalo & Lackawanna Traction Co., Buffalo	1918	8.80	55,000	1,000,000	None
Eighth & Ninth Avenues Ry., New York	1927	37.27	232,000*	None	None
Empire State Railroad Corp., Syracuse	1927	70.00	2,950,000	2,750,000	None
Geneva, Seneca Falls & Auburn R.R., Geneva	1926	12.00	157,100	507,000	None
Hamburg Ry., Buffalo	1920	21.72	None	750,000	27,000
Ithaca Traction Corp., Ithaca	1924	12.72	400,000	763,000	25,000
Manhattan & Queens Traction Corp., Long Island City	1917	21.66	20,000	None	None
New York & Queens County Ry., Jackson Heights	1923	35.07	3,235,000	1,300,000	None
Ogdensburg Street Ry., Ogdensburg	1922	7.74	150,000	150,000	None
Olean, Bradford & Salamanca Ry., Olean (8)	1926	100.00	3,808,000	472,818	None
Penn Yan & Lake Shore Ry., Penn Yan	1918	8.50	94,000	100,000	None
Second Avenue R.R., New York (1)	1908	23.96	1,862,000	5,682,000	3,140,000
Staten Island Midland Ry., Brooklyn	1920	28.68	1,000,000	1,000,000	3,000
Steinway Ry., New York	1922	31.11	None	1,500,000	None
Westchester Street R.R., New York (1)	1920	16.32	700,000	168,000	None
OHIO					
Cincinnati, Lawrenceburg & Aurora Electric Street R.R., Cincinnati	1913	31.67	808,900	750,000	None
Indiana, Columbus & Eastern Traction Co., Springfield	1921	153.23	4,025,000	7,900,000	65,000
OKLAHOMA					
Lawton Railway & Light Co., Lawton	1927	6.31	100,000	100,000	None
Tulsa Street Ry., Tulsa	1925	23.00	580,000	771,000	None
PENNSYLVANIA					
Schuylkill Ry., Girardville	1927	34.00	400,000	1,550,000	None
Pennsylvania & Maryland St. Ry., Meyersdale (4)	1927	7.00	190,800	216,000	.....
UTAH					
Salt Lake & Utah R.R., Salt Lake City	1925	96.71	5,043,700	2,611,292	100,000
Net receiverships Dec. 31, 1927 (51 cos.)	.....	3,750.73	$95,951,705	$230,814,865	3,553,150

(1) Sold at foreclosure.
(2) Sold at foreclosure and operations discontinued.
(3) Property now operated by Peoria Terminal Co. Receiver not yet discharged.
(4) Foreclosure pending.
(5) Property liquidated. Receiver not yet discharged.
(6) Sold at foreclosure in 1926.
(7) Operations discontinued December 31.
(8) Property being dismantled.

were placed in the receiver's hands, which is almost 50 per cent reduction from last year. Fifty-one companies, with 3,750 miles of track, are now in receivership, compared with 55 companies, with 4,307 miles of track, on Jan. 1, 1927, or a reduction of four companies and 557 miles of track.

In the amount of securities involved, the record for the year shows an encouraging situation. The total of fixed obligations of the companies entering receivership during the year was $20,875,450 and the total of stocks and bonds of all descriptions was $38,490,500. This contrasts with 1926, when $117,560,073 of fixed indebtedness and $135,329,508 of total capitalizations were forced to seek protection of the courts. The total reduction in 1927 in securities involved amounts to $96,071,446, or slightly more than 22½ per cent.

After many months of negotiations a new franchise agreement was reached in St. Louis. The St. Louis Public Service Company took over the properties of the United Railways and the Missouri Electric Railroad and the eight-year receivership of the two latter companies was terminated. The new company was organized in 1926 to buy the properties, but foreclosure sale was not effected until 1927.

The United Railways of St. Louis was the largest city property in receivership, with the exception of the Chicago Railways, which is not involved in financial difficulties. The expiration of the Chicago Railways franchise, as explained in the Statistical Number of Jan. 1, 1927, caused it to go into receivership as a protection to its bondholders. The railway is still operating on short-term extensions of two or three months, while negotiations are going on and legislation is being introduced to solve the problem of street railway operation in Chicago.

Three properties at Rockford, Ill., comprising more than 100 miles of track, sold at foreclosure in 1926, completed their reorganization in 1927 and are now being operated as the Rockford Public Service Company and the Elgin, Belvidere & Rockford Railway.

Receivers of the Oklahoma Railway, Oklahoma City, Okla., were dismissed on Dec. 16 and the properties turned over to the new owners, who immediately announced that rearrangement of the financial structure was under way.

In July service was suspended on the Kansas City, Lawrence & Topeka

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Table V—Receiverships Terminated and Foreclosure Sales During 1927

Receivers Discharged With or Without Foreclosure Sales or Following Abandonment	Miles of Single Track Involved	Capital Stock	Funded Debt	Receivers' Certificates	
Denver & Interurban R.R., Denver, Col.	45.63	$101,500	$1,079,000	None	Sold at foreclosure, entire property dismantled and bus service substituted under the name of Denver & Interurban Motor Company.
Hartford & Springfield Street Ry., Warehouse Point, Conn.	48.00	785,000	961,000	None	Property liquidated.
Murphysboro & Southern Illinois Electric R.R., Murphysboro, Ill.	11.00	(b)	(b)	(b)	Sold at foreclosure sale for scrap.
Rockford, Beloit & Janesville Ry., Rockford, Ill.	(a)	(a)	907,000	None	Reorganized and receiver discharged.
Rockford City Traction Co., Rockford, Ill.	36.17	(a)	(a)	None	
Rockford & Interurban Ry., Rockford, Ill.	76.00	4,000,000	2,175,000	None	
Kansas City, Kaw Valley & Western Ry., Bonner Springs, Kan.	42.31	250,000	1,000,000	None	Sold at foreclosure sale and reorganized as the Kansas City, Kaw Valley Railroad.
Boston & Worcester Street Ry., Framingham, Mass.	83.00	2,482,200	2,520,000	None	Sold at foreclosure to the Boston, Worcester & New York Street Ry.
Mesaba Ry., Virginia, Minn.	38.00	2,260,000	1,581,000	None	Property dismantled and receiver discharged.
Grandview R.R., St. Louis, Mo.	15.00	(b)	(b)	(b)	Sold at foreclosure and property dismantled.
Missouri Electric R.R., St. Louis, Mo.	20.97	1,000,000	700,000	None	Sold at foreclosure sale and reorganized as the St. Louis Public Service Co.
United Railways Co., St. Louis, Mo.	436.32	41,296,000	52,590,000	None	
Portsmouth, Dover & York Street Ry., Portsmouth, N. H.	12.00	.....	707,000	$30,000	Receiver discharged. Property sold and dismantled in 1926.
Long Island Electric Ry., Jackson Heights, N. Y.	24.97	600,000	600,000	None	Receiver discharged. Property operated by Jamaica Central Railways, Inc.
Cincinnati, Georgetown & Portsmouth R.R., Cincinnati, Ohio.	54.00	1,500,000	1,000,000	None	Reorganized and receivership terminated.
Sharon & New Castle Street Ry., Youngstown, Ohio	17.00	120,000	120,000	None	Sold at receivers' sale for scrap.
Oklahoma Ry., Oklahoma City, Okla.	138.45	5,595,900	5,815,000	.....	Receivership terminated.
Total of receiverships terminated (17 cos.)	1,098.82	$51,990,600	$71,755,000	$30,000	

Sold at Foreclosure Sale But Receiver Not Yet Discharged

Washington-Virginia Ry., Washington, D. C.	40.00	2,378,300	5,614,000	None	Sold at foreclosure sale. Property now operated as the Mt. Vernon, Alexandria & Washington Railway and the Arlington & Fairfax Railway.
Chicago & Interurban Traction Co., Chicago, Ill.	50.00	1,000,000	1,816,000	None	Property sold and operation discontinued.
Kansas City, Lawrence & Topeka Electric Ry., Kansas City, Mo.	12.00	250,000	400,000	None	Sold at foreclosure sale. Operations suspended July 16, but negotiations now under way for resumption of service.
Morris County Traction Co., Morristown, N. J.	68.98	300,000	4,179,000	None	Sold at foreclosure to Public Service Transportation Co.
Second Avenue R.R., New York, N. Y.	23.96	1,862,000	5,682,000	3,140,000	Sold at foreclosure sale. Reorganization plan now pending before New York Transit Commission.
Total of foreclosure sales without discharge of receivers (5 cos.)	194.94	$5,790,300	$17,691,000	$3,140,000	

Foreclosures Without Receiverships in 1927

Auburn & Syracuse Electric R.R., Auburn, N. Y.	29.04	1,962,000	1,742,000	.....	.....
Port Arthur Traction Co., Port Arthur, Texas	7.00	333,000	323,000	.....	.....
Batavia Traction Co., Batavia, N. Y.	2.50	10,000	14,100	.....	Operations abandoned.
Willamette Valley Southern R.R., Oregon City, Ore.	35.97	.....	666,000	.....	.....
Total foreclosures without receiverships (4 cos.)	74.51	$2,305,000	$2,745,100		

(a) Included with Rockf ord & Interurban Ry. figures.
(b) Information not available.

Electric Railroad, Kansas City, Mo., following a receivership of eight years. The property was sold at foreclosure sale in August for junk. Residents along the route were so anxious to have operation resumed that the purchaser agreed to defer dismantling the tracks until they had an opportunity to make arrangements for operating the line. Negotiations are still under way to accomplish this, and it is hoped that operation will be resumed early this year.

The Kansas City, Kaw Valley & Western Railway, Bonner Springs, Kan., was sold at foreclosure and reorganized as the Kansas City, Kaw Valley Railroad. Interest charges have been reduced from $82,470 to $30,000 a year through the reorganization.

Foreclosure of the Second Avenue Railroad, New York City, occurred early in 1927 and the reorganization plan is now before the New York Transit Commission for approval, the receivership being expected to end early in 1928.

Three railways included in Table I, New Receiverships, are also shown in Table V, Terminations. These are the Cincinnati, Georgetown & Portsmouth Railroad, Cincinnati, Ohio; the Grandview Railway, St. Louis, Mo., and the Murphysboro & Southern Illinois Electric Railroad, Murphysboro, Ill. Of these, the two latter companies terminated their receiverships after foreclosure sale and dismantling of the properties. Termination of the receivership of the Cincinnati, Georgetown & Portsmouth Railroad was effected through reorganization after a receivership of less than six months.

Three other properties were sold and dismantled, the Denver & Interurban Railroad, Denver, Col.; the Mesaba Railway, Virginia, Minn., and the Sharon & New Castle Street Railway, Youngstown, Ohio. In the case of the Denver & Interurban Railroad, bus service was substituted under the name of the Denver & Interurban Motor Company. Although the Portsmouth, Dover & York Street Railway, Portsmouth, N. H., was sold and dismantled in 1926, the receiver was not discharged until 1927.

The property of the Washington-Virginia Railway, Washington, D. C., was sold at foreclosure and purchased by two companies organized to take it over, the Mount Vernon, Alexandria & Washington Railway and the Arlington & Fairfax Railway. These companies are operating the property under one management and dismissal of the receiver is looked for early this year.

The Westchester Street Railroad was sold to the Third Avenue Railway in 1926 and is now being operated by that company. To all practical purposes the receivership is over, but the actual dismissal of the receiver has not taken place, so the figures are still carried in Table IV.

Control of the Hannibal Railway & Electric Company, Hannibal, Mo., was purchased last winter by owners of the Hannibal Transportation Company, operating bus lines in and out of Hannibal. A voluntary petition in bankruptcy was filed in October, 1927, to dispose of the indebtedness taken over and a receiver was appointed.

The Morris County Traction Company, Morristown, N. J., was purchased at foreclosure sale by the Public Service Transportation Company, bus subsidiary of the Public Service Railway, Newark, N. J.

At the close of 1927 only three large companies remained in receivership, the Chicago Railways, with 597 miles of track; the Union Traction Company of Indiana, 445 miles, and the Detroit United Railways, 614 miles.

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Manufacturers Reflect Confidence for 1928

Continuation of good times seen in opinions of industrial leaders and reports of 100 industrial business and engineering editors. Manufacturers close to electric railway industry look on new year with confidence

SOUND business conditions for the country in 1928 are reflected in the opinions of leaders of industry in the retail, utilities, manufacturing and other fields. These coincide with the forecasts of some of the leaders in finance, civic and trade organizations. In pre-visioning stability for 1928 some among them have based their beliefs on the present abundance of credit at low rates, volume of farm purchasing power resulting from improved agricultural conditions during 1927, low inventories and other controlling factors.

While in the offing looms up the shadow of a presidential campaign and the possibility that the coming campaign may tend to have an upsetting influence on business conditions, yet this does not appear to be viewed with any decided apprehension. The feeling evidently is one of confidence in the stability of the country's general economic position.

In connection with the views just quoted on credit and the presidential election, it is interesting to note what James S. Alexander, chairman of the board of directors National Bank of Commerce in New York, said at the annual meeting of shareholders on Jan. 10:

> While easy money alone is not sufficient to assure prosperity, it is a great help toward it, and it was unquestionably an important factor in business throughout 1927. The maintenance of the comparatively low rates which prevailed has been assisted by the open-market operations of the Federal Reserve Bank and the very moderate demands of commercial and industrial borrowers for funds. Present indications seem to point, not to cheaper money, but to fairly stable moderate rates, a condition highly favorable to good, sound business.

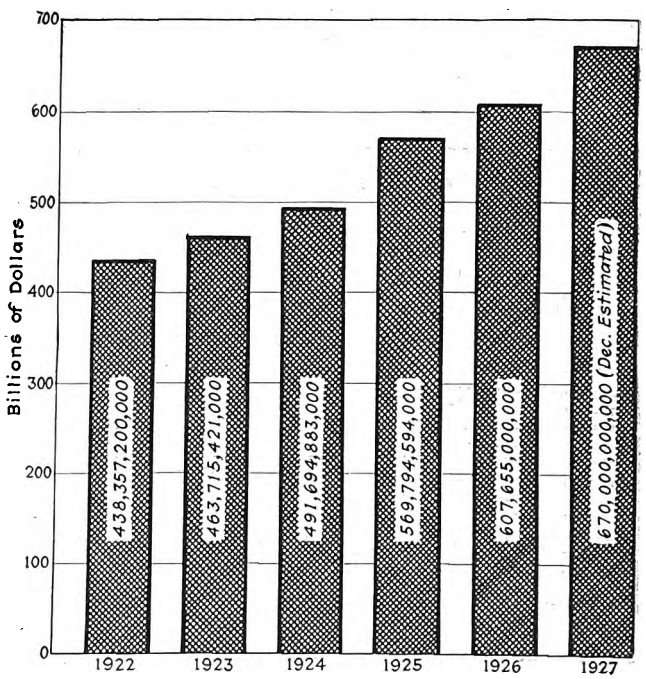
* * * * *

> The record for many years back discloses no definite connection between presidential elections and the course of business. Some presidential years have been prosperous; some, periods of depressions, and some mixed. While the approach of the election will probably be reflected in a little more caution than might otherwise be in evidence, there is not much likelihood of the development of any seriously disturbing issue and we can foresee no justification for business nervousness because of politics.

Further indication of a continuation of prosperity in 1928 is found in a composite summary of year-end reports made to the National Conference of Business Paper Editors and the Associated Business Papers, Inc., by 100 editors of industrial, business and engineering publications.

Business Editors Review Prospects

Business in the United States reaches the close of 1927 in a sound condition and faces 1928 with every prospect of continued prosperity and of definite gains in certain basic industries, according to the above summary. The forecast also indicates that the buying power of the American farmer will increase during the present year and forsees continuance of wages at their present levels in the basic industries.



Bank debits to individual accounts, as reported by Federal Reserve Bank, reflect stability and prosperity of country

Outstanding in the policies of industry which will continue through 1928 are scientific determination of markets in line with intensive effort to reduce selling costs, and further widespread replacement of obsolete and inefficient machinery. The editors report at the year's closing a lack of excessive inventories, except in a few specialties where markets have been overestimated. Price trends indicate that levels will be about the same as they were in 1927, with some trades just now showing a softening in prices. Reduction in size and intensive development of jobbing areas is seen. No indications of slump are found on the nation's business horizon.

In reviewing 1927, the summary shows that indexes of trade which measure week-to-week activities, such as electric power used, output of pig iron and steel ingots, building construction and freight loadings, are slightly under those of 1926. Power used in 1927 increased 7 per cent over the previous year. Pig iron totaled 36,300,000 tons, putting 1927 in eighth place among big years. Steel ingot output was about 8 per cent less for 1927 than in 1926, making 1927 fifth among years of largest output.

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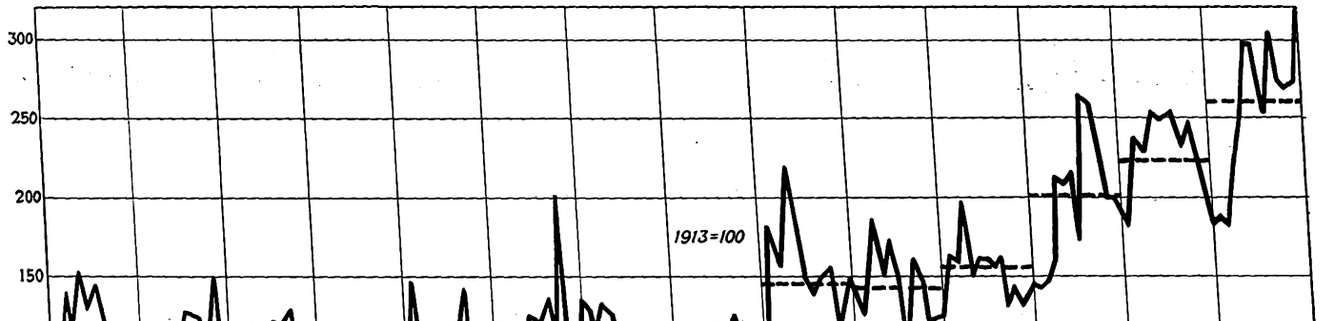


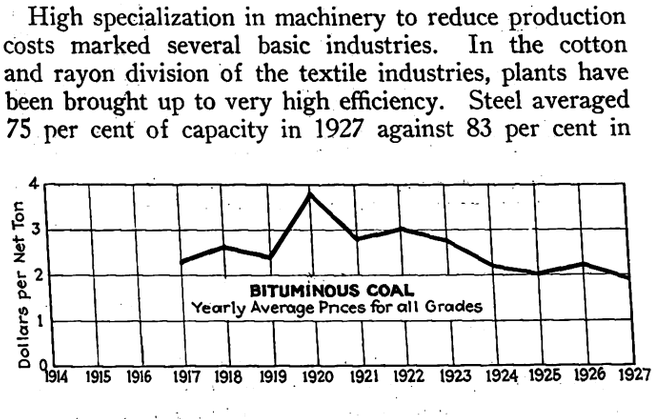
General construction volume index figure rises to highest point in fourteen years

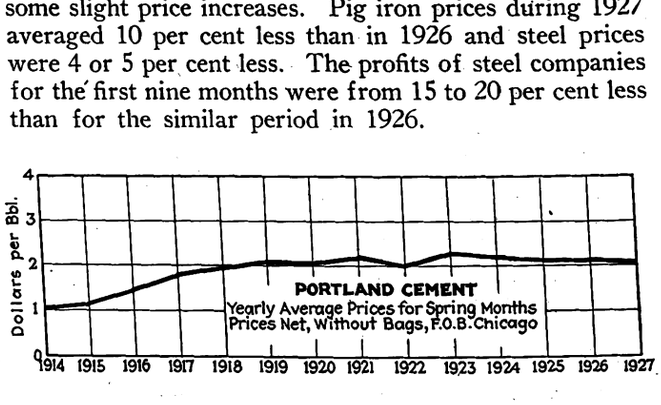
Volume of railroad freight declined, especially in the latter part of 1927, but in common with other trades there is expectation of an increase in freight in 1928. The volume of water-borne freight was slightly greater in 1927 than in 1926, and tonnage rates held steady.

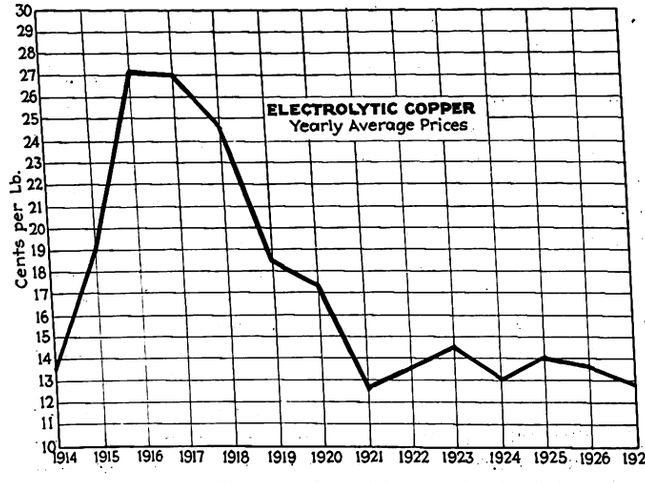
Building construction is reported lower, due to reduction of residential building, with industrial construction and certain classes of public works building very much increased. Heavy engineering construction is 11 per cent higher, industrial construction is 2½ per cent higher, electric light and power plant construction about 5 per cent over 1926, with an estimated additional 5 per cent increase in 1928.

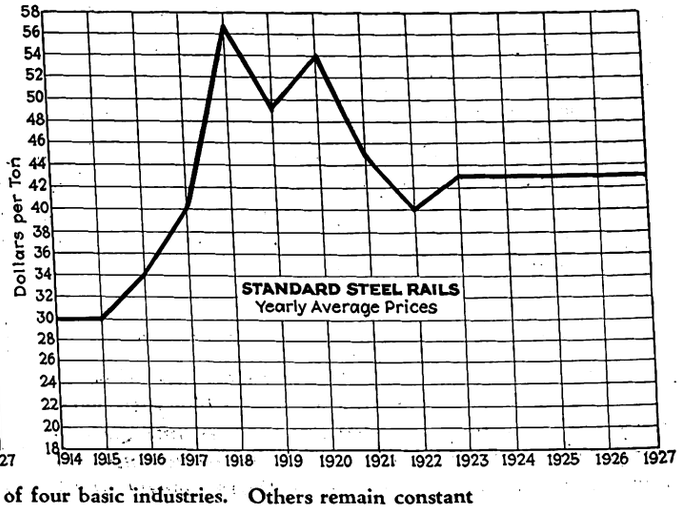
High specialization in machinery to reduce production costs marked several basic industries. In the cotton and rayon division of the textile industries, plants have been brought up to very high efficiency. Steel averaged 75 per cent of capacity in 1927 against 83 per cent in 1926, and pig iron capacity 73 per cent in 1927 against 80 per cent in 1926. In metal working lines the average of working operations was about 15 per cent less than in 1926. Nineteen hundred twenty-eight is expected to equal 1927. Railway equipment was used to greater efficiency in 1927. In the furniture trades there was about 90 per cent use of equipment.

The total payrolls in practically all industries were less in 1927 than in 1926. The notable exception was in the field of transportation. Railroad payrolls advanced about $60,000,000. Prices throughout 1927 are reported as slightly lower and the margin of profit less, but the outlook for 1928 is generally considered favorable, with some slight price increases. Pig iron prices during 1927 averaged 10 per cent less than in 1926 and steel prices were 4 or 5 per cent less. The profits of steel companies for the first nine months were from 15 to 20 per cent less than for the similar period in 1926.









Downward trend in price levels of three out of four basic industries. Others remain constant

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In general, the close of 1927 finds the industries of the United States with stocks which deviate little from the volume at the close of 1926, reflecting continued hand-to-mouth buying. In the oil field the total stocks of crude and refined products increased about 12 per cent during this year. In the paint industry they are generally considered low. Iron and steel stocks are considerably lower than they were a year ago and the unfilled orders of the steel companies are from 12 to 15 per cent below those of the close of 1926. Crude rubber stocks are ample to offset any upward price movement. Volume of coal trade was less in 1927 than in 1926 and stock of coal on hand is greater.

In the chart of four basic industries accompanying this article, the 1927 yearly average prices for bituminous coal (all grades), Portland cement and electrolytic copper moved down, and that for standard steel rails remained the same as for 1926. This lack of any drastic change in prices indicates a reasonable steadiness of supply and demand and reflects a normalcy in basic manufacturing and transportation industries.

One of the elements which helps to make a composite gage to determine the stability of the country's business is the yearly total of bank debits to individual accounts, as reported by the Federal Reserve Bank. The accompanying chart shows this figure over a period of years. The figure for December, 1927, is not given by the Reserve Bank but has been estimated on the basis of December, 1926.

Light and Power Industry

In reviewing 1927 it is of interest to observe in the Jan. 7, 1928, issue of *Electrical World* that in 1927 the light and power industry used more than 37,000,000 tons of coal and that each year for several years the consumption of coal has increased at the rate of about 1,000,000 tons a year. Electrical manufacturers of heavy equipment did a gross business of about $1,000,000,000. In the same publication an article, "Light and Power Progress," by G. F. Wittig, statistical editor, furnishes the following information:

The year 1927 has witnessed a normal growth and development in the light and power industry. Its operations continue to expand, its service continues to supply an increasing demand and its management continues to develop better ways of doing business.

The 4,400 operating properties supply electricity to 21,700,000 customers in the United States. For this service they receive a gross revenue of $1,783,000,000. Operating and maintenance expenses used $767,000,000 of the revenue, taxes to local, state and national governments accounted for a sum estimated to be $150,000,000, and the balance of the revenue took care of incidentals, development expense, depreciation and obsolescence, and the credit requirements of an industry group whose operating and holding company capitalization aggregates $9,500,000,000. In 1927 the light and power utilities raised more than $2,100,000,000 in the money markets which they used for refunding high-rate issues and for additions to service facilities. Of this sum, $240,000,000 was raised by direct sales of securities to customers and employees in 344,000 individual sales. The capital expenditures for these properties aggregated $760,000,000 in 1927, and the budget for 1928 amounts to $900,000,000.

In their normal operations the light and power companies generated 75,100,000,000 kw.-hr., of which 29,000,000,000 kw.-hr. came from waterpower plants and 46,100,000,000 kw.-hr. from fuel-burning stations. The generating capacity of the industry aggregates 29,000,000 kva.; of the prime movers water power operates 11,700,000 hp. This power supplied nearly 16,000,000 of the 35,800,000 hp. driving our factories, to quote 1925 census figures, and it gave to the cities and homes the services and conveniences which only electricity can render.

Electric Railway Manufacturers Take Confident View

In order to obtain an idea of the prospects of the electric railway industry in 1928, as determined by its purchases, the Journal has queried executives of representative manufacturing companies in close contact with its needs and developments. The outlook is pretty generally viewed with optimism and confidence, as will be noted in the following opinions:

General Electric Company

DURING 1927, the electrical manufacturing business in general has been satisfactory, with approximately the same volume as in 1926. We look for additional activity during 1928 as most of the utility companies have already completed their financing and the total budget of expenditures for 1928 exceeds materially that of 1927.

We feel that economic conditions are sound and that the transportation companies will show added activities which will require additional electrical equipment for buses, street cars and locomotives.

J. G. Barry,
Vice-President.

Westinghouse Electric & Manufacturing Company

RAILWAY equipment business for 1927 has not measured up to what was anticipated at the begining of the year. The equipment business booked has been less than for the year 1926, whereas at the beginning of 1927 it was anticipated that this business would exceed that of 1926.

The association program looking toward more extensive modernization of cars has not as yet accomplished the full results hoped for in the actual replacement of obsolete equipment. It has, however, inspired a great deal of development on the part of the manufacturer and a great deal of interest on the part of the industry in new designs and new types of drive, which are now available. Having devoted the year largely to an intensive study and trial of the many new developments, the industry should now be in a position to decide what is best and enter upon a real program of purchasing new equipment in 1928.

Electric railway business must keep pace with the growth, the development and the expansion of our cities. The year 1928 will, undoubtedly, see a considerable increase in the purchase of automobiles, which will cause even greater congestion in the business districts than at present. The result will be favorable to the electric railways in that the car riding will be increased. Increased riding must be stimulated by more up-to-date and attractive equipment and this will result also in reduced operating expenses.

The gas-electric bus has a place, distinctly its own, in street railway transportation and there will undoubtedly be a gradual increase in the number of these equipments placed in service by electric railway companies.

While the railway equipment business in 1928 will not show a phenomenal increase over the year just closed, it is believed that the study and development of the past year should result in an increase in business, as compared with 1927, of about 25 per cent.

A. J. Manson,
Manager Traction Apparatus.

The J. G. Brill Company

THE year 1927, just passed, was one of the poorest in the history of car building. While car builders during the year contributed more in the way of equipment development than during previous years, the comparatively few purchases must not be construed as indicating a lack of appreciation on the part of the operating companies of the importance of improvements made. In most cases the value of present equipment represents a large percentage of the entire valuation upon which fare rates are based. The economic advantages of modern types of equipment are, therefore, placed beyond the reach of many electric railway companies due to inability to disturb the present arrangement.

Careful analysis of the situation on various properties reveals in many cases particular conditions involving franchises, paving regulations, etc., beyond

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the control of the railway, which hinder the modernization program.

Equipment design has progressed. The improvements are here, and the industry through the agency of the trade press is familiar with what has been accomplished. Whether 1928 will witness any change in the situation depends principally upon electric railways obtaining relief from the particular conditions which have hindered the introduction of modern cars.

SAMUEL M. CURWEN,
President.

The Cincinnati Car Company

THE surest way to forecast trade conditions is to take a retrospective view of the growth of this great country. We find it has prospered from the beginning, and its growth has been linked at every stage with developments in transportation.

Electric railways have contributed their share to this prosperity; and while the motor bus and private automobile are supplying a part of today's increased demand for transportation, established railway lines are still the safest and cheapest means of urban travel, and will continue to dominate the field. The year 1928 promises increasing activities on the part of operating and manufacturing companies to meet the demand for more comfortable and faster moving cars.

H. L. SANDERS,
President.

Haskelite Manufacturing Corporation

OUR business in 1927 was slightly less than in 1926, but not to the same extent that the purchase of new cars decreased. This year we look for a greatly increased business as a result of our development efforts during the past few years. The riding public is demanding strong lightweight cars of greatly improved appearance. The satisfying of this demand means increased sales for us. The introduction of a 40-passenger single-deck bus will stimulate operators to improve their rolling stock. We are very optimistic for 1928.

JAMES R. FITZPATRICK,
Vice-President and Secretary.

Bridgeport Brass Company

OUR business with the transportation companies during 1927 was not equal to that of 1926. This, no doubt, was due to conditions throughout the country which seemed quite general and resulted in less business in most industries.

We do feel that there are indications that 1928 will show a considerable improvement, and we are quite optimistic in regard to the outlook.

A. D. GUION,
Advertising Manager.

Ohio Brass Company

IT has become recognized in the electric railway industry that successful transportation is not only a matter of improving service but of improving the methods of selling that service and the orgnization back of it. In this connection there has been a trend toward better equipment, track and overhead. From this progression, in 1927, our company has experienced a good volume of business with O-B products for car, track and overhead. Likewise, it is anticipated that this continued interest and activity of railway men will result in an increased business in 1928.

E. F. WICKWIRE,
Vice-President.

A.C.F. Motors Company

IN OUR opinion, motor coach transportation made considerable progress in 1927 despite the fact that coach manufacturers generally sold fewer coaches than in previous years. There was, we believe, a more careful selection of the types of vehicles purchased and a marked improvement in the methods, application and operation of motor coaches by the electric railway companies generally.

We believe that more coaches will be sold in 1928 than in 1927, and we naturally believe that the tendency is toward the purchase of heavy-duty vehicles. There is a decided trend toward the purchase of the very best equipment possible, regardless of its price.

We look for the retirement of a considerable number of light-duty coaches bought during the years of 1923 and 1924 which are no longer able to furnish the type of transportation demanded by the American public. These will undoubtedly be replaced to a certain extent by heavy-duty vehicles, both of the standard urban coach and of the de luxe urban coach types. In order to increase the ratio of passenger-miles, we anticipate the establishment of many high-speed, high-fare motor coach lines in city and suburban service, designed to appeal to the habitual coach rider morning and evening and to the present-day automobilist during the off-peak hours.

We feel that all motor coach manufacturers have made considerable progress in design and construction during 1927 and that this will result in improved motor coach transportation as the newer types and models of motor coaches are put into service by the electric railways in 1928.

C. S. SALE,
President.

Twin Coach Company

OUR analysis of bus operation throughout the United States indicates that 1928 should be a banner year from bus sales standpoint for two reasons. First, the introduction of single-deck coaches of larger carrying capacity is and will continue to open up entirely new fields for the economic operation of motor coaches. Second, many of the larger transportation companies will have a rather large number of coaches that will be completely written off and replacement equipment will be purchased, whereas 1927 saw very little replacement equipment purchased.

F. R. FAGEOL,
President.

The White Company

BUSINESS prospects for 1928 in the motor truck and bus industry indicate a much better year than 1927 turned out to be. Most manufacturers have studied and analyzed general conditions as reflected in business reports from all parts of the country, have sized up the readings of the so-called "barometers" of business and agreed in the prediction that the new year will be one of greater volume and prosperity—possibly the biggest year in the history of the automotive industry.

The year now closing has been one not only of severe competition, small margins of profit and dull business in certain localities, but a year of readjustment. New tendencies in highway transportation have dictated new developments in motor vehicles for hauling of both passengers and freight, as well as revamping of manufacturers' lines to a certain extent. Most of this work has been accomplished, and we look forward eagerly to 1928 as a year of renewed activity in selling.

So far as The White Company is concerned, we are ready to meet the conditions of the new year. This growing tendency toward lighter and more flexible units has necessitated production changes. New White models of light delivery and fast express trucks, introduced during 1927, are in full production now. This is true also of the new White six-cylinder, 100-hp. bus. The latter part of the year has witnessed the cleaning up of repossessions and other unavoidable obstacles. The new year finds our company with a balance sheet showing an exceptionally strong financial position, with a complete line to meet the new demands of motor transportation in all its commercial phases, and with every confidence that 1928 is to be a good year.

WALTER C. WHITE,
President.

Metal & Thermit Corporation

WE ARE very optimistic for the electric railway business for 1928. During 1927 our business with street railways increased more than 40 per cent over 1926, and we are looking forward to a similar increase in 1928.

While there is still some doubt by the railway operators in the future of the industry, which we think is unwarranted, there is a general tendency toward optimism which has led most companies to seek out the best and most permanent methods of doing their

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work. It is interesting to know that practically all the railways that have taken an optimistic view of the future and have made concerted efforts to give the public what it wants in the way of modern transportation, are making their operation a success.

It is to be hoped that 1928 will see a larger percentage of the railways in this class.

JOHN T. TINNON,
Manager Rail Welding Department.

Consolidated Car-Heating Company

EQUIPMENT orders from transportation companies were somewhat disappointing during a part of 1927. Toward the end of the year conditions materially improved, and we look with confidence into the year 1928.

CORNELL S. HAWLEY,
President and Treasurer.

National Pneumatic Company

IN 1927, it seems to us, transportation has come much closer to its goal, not only keeping pace but catching up with the demands of constantly increasing traffic. Facilities have been extended. Equipment has been added to or adapted to meet new demands with greater efficiency and at a lower operating cost.

Co-ordination has brought various branches of service into closer relationship and affiliation. This results in broader and better service to the public. We look for a continuation of, and even an acceleration of, this tendency in 1928, with increased patronage and reduced expense for all modern and progressive transportation agencies.

T. W. CASEY,
Vice-President.

SKF Industries

THE year 1927 was from our observations one in which the transportation companies showed a disposition to give serious thought to matters of maintenance and the general improvement of the efficiency of their service.

While the volume of business done by us with them was not large, it was satisfactory in character. From present appearances it is our judgment that the year 1928 should show a substantial improvement in volume over that of last year.

S. B. TAYLOR,
General Sales Manager.

The Tool Steel Gear & Pinion Company

OUR railway gear sales in 1927 were about 5 per cent better than in 1926. Our export gear business showed a similar improvement. Approximately one-sixth of our total sales was in new equipment, i.e., where our gears were specified on new motors for new cars. This class of business showed a decided improvement over 1926 and has been increasing from year to year for the last few years.

We look for a much greater improvement, especially in the new equipment field, during 1928. It has been evident of late that the electric railway industry is coming back and that the method is to be snappy service with modern equipment. We feel the next few years will show a decided improvement in purchases for rehabilitation, and that the industry will buy the best equipment it can get. It will look to ultimate operating economies and good will on the part of its patrons to bring electric railways back to the place they deserve.

E. S. SAWTELLE,
Assistant General Manager.

Portland Cement Association

THE street car companies are emerging from the period of adjustment made necessary by conditions brought about by bus and automobile transportation. They are meeting this competition with better service, better equipment and better track.

The engineering departments of the street railway companies are giving more attention than formerly to the development of standard designs of car track construction and particularly to that portion of the track structure that must transfer the loads to the soil.

While exact data are not available, it appears that the use of a definite rigid foundation to support car tracks is gaining favor and that more of the so-called "rigid" type was constructed in 1927 than in any previous year.

The outlook for car track reconstruction rehabilitation in 1928 is promising. The extent of it will, of course, depend in a large measure on the money available for such work.

A. C. IRWIN,
Manager Railways Bureau.

Ohmer Fare Register Company

THE business of the Ohmer Fare Register Company in the past twelve months showed a marked degree of progress and expansion, and in fact 1927 was the best year in our history.

The progressive transportation manager is less inclined than ever before to depend on guesswork in the operation of his system, but requires a method that will insure an accurate and dependable record of the income derived from each day's operation. The Ohmer system of fare registration was therefore in great demand in 1927.

With the realization of transportation managers generally of the importance of protecting income at its source and furnishing statistical data concerning the operation which is of vital importance, the demand for our products increases proportionately, and our opportunities for 1928 give great promise of a record year.

JOHN F. OHMER,
President.

Heywood-Wakefield Company

I CONSIDER the outlook for the sale of seats to transportation companies during 1928 to be excellent, especially in the line of bus seats. During 1927 we had a banner year in our car seat department. We are looking forward to even better business during 1928.

BERTRAM BERRY,
Manager of Sales, Car Seat Department.

Westinghouse Air Brake Company

WE ARE entering the year 1928 with a decided feeling of optimism for business in general and particularly so for the transportation and allied industries.

General conditions throughout this country are fundamentally sound and most lines of business are now striking the stride that indicates an active and prosperous year.

As relates to the transportation industry, it is obvious that the high degree of efficiency with which it is being operated (both steam and electric) has brought about a return of confidence as indicated by the large purchases of rolling stock during the past 60 days.

The substantial improvements that have been made and are continuing in the electric railway industry, contributing to the comfort and convenience of the public, has brought about an appreciation on the part of the public that their interests are best served by upholding and supporting the service and, with the extension of the improvements and with proper co-ordination of electric car and bus service, the industry as a whole should enjoy a very prosperous year.

S. G. DOWN,
Vice-President.

Globe Ticket Company

DESPITE a temporary wave of false economy, which brought price into undue prominence in some quarters during 1927, the year was one of great advancement for us in the transportation field.

Progressive properties are showing a quickened interest in fare control methods which are safe, efficient and genuinely economical from every standpoint. Among other favorable indications, two of the largest transfer users in the United States invited our suggestions, abandoned their old concepts and placed their business with us.

Electric railway properties in 1927 definitely started on the return swing of their prosperity pendulum.

P. C. SNOW,
Vice-President.

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Association Activities

Program Complete for C.E.R.A. Meeting

THE final program for the Central Electric Railway Association meeting at Cincinnati, Ohio, has been completed. Following is the schedule of events:

THURSDAY, JAN. 26, 1928

9:30 A.M.—Address of Welcome, Hon. Murrray Seasongood, Mayor of Cincinnati, Ohio.

Address of the President, M. Ackerman, manager Peoples Railway, Dayton, Ohio.

"Relationship of Freight Traffic to Revenue," by F. D. Norviel, general passenger and freight agent Union Traction Company of Indiana.

"The Situation in Cincinnati," by W. A. Draper, president Cincinnati Street Railway.

12:30 P.M.—Adjournment for lunch.

2:00 P.M.—Motor coach tour of the city of Cincinnati and inspection of the shops of the Cincinnati Street Railway.

6:30 P.M.—Association dinner.

Address, Judge Roland W. Baggott, Dayton, Ohio.

Dance.

FRIDAY, JAN. 27, 1928

9:30 A.M.—"The Cincinnati Plan," by Edgar Dow Gilman, Director of Public Utilities city of Cincinnati.

"Publicity," by J. E. Morton, secretary Ohio Bankers Association, Columbus, Ohio.

"Advertising Transportation. How Much of It Is Science? How Much of It Is Bunk?" by E. T. Gundlach, Gundlach Advertising Company, Chicago, Ill.

General business.

Election of officers.

International Street Railway Convention at Rome

PUBLICATION of the preliminary program for the Rome meeting of the Union Internationale de Tramways, de Chemins de fer d'Intérêt local et de Transports Publics Automobiles, has just been made by the secretary of the association from association headquarters in Brussels, Belgium. It is as follows:

Sunday, May 6—Registration, issue of final program, meeting of the executive committee.

Monday, May 7, 9:30 a.m.—Reception and opening session to be held in the Campidoglio building (Capitol); afternoon, technical session; theater party in the evening.

Tuesday, May 8, 9 a.m.—Technical session; 2 p.m., a sightseeing tour; 5 p.m., visit to the Campidoglio; 8:30 p.m., banquet offered by the Municipal Tramways of Rome.

Wednesday, May 9, 9 a.m.—Technical session; 1 to 2 p.m., departure by special train for Naples; 5:30 p.m., arrival at Naples and sightseeing trip; 9:30 p.m., reception by the municipal authorities of Naples at the Palais Royal.

Thursday, May 10, 9 a.m.—Trip to Pompeii and return to Rome by special train in the evening.

Friday, May 11, 9 a.m.—Technical session; 2:30 p.m., excursion to the environs of Rome.

Saturday, May 12, 9 a.m.—Technical session; 3 p.m., inspection visit to the offices and carhouses of the Rome Tramways; 8 p.m., complimentary banquet offered by the National Facisist Transportation Association of Italy.

Sunday, May 13, 9 a.m.—Technical session, business meeting and adjournment; 2:30 p.m., sightseeing tour; 8:30 p.m., departure for Turin.

Monday, May 14, 9 a.m.—Arrival at Turin; 11 a.m., reception at Porta Nuova for a visit to the exposition and luncheon offered by the Municipal Tramways of Turin; afternoon, visit to the exposition and the city; evening, theater party.

Tuesday, May 16—Visit to the offices and shops of the Fiat Automobile Company; excursion to the environs of Turin, and luncheon offered by the Società Ferro-Tramviarie; evening, departure for Milan.

Wednesday, May 16—Visit to the Milan Exposition in the morning; trip around the city in the afternoon; and dinner offered by the Milan municipal authorities in the evening.

Thursday, May 17—Excursion to the Italian Lakes.

COMING MEETINGS OF *Electric Railway and Allied Associations*

***Jan. 16-17*—Midwest Electric Railway Association, Arlington Hotel, Hot Springs, Ark.**

***Jan. 18-19*—Kentucky Association of Public Utilities, annual meeting Brown Hotel, Louisville, Ky.**

***Jan. 18-19*—Central Electric Traffic Association, Hotel Gibson, Cincinnati, Ohio.**

***Jan. 25*—Central Electric Railway Master Mechanics' Association, Hotel Gibson, Cincinnati, Ohio.**

***Jan. 25-26*—American Railway Association, Motor Transport Division, organization meeting, Palmer House, Chicago, Ill.**

***Jan. 25-27*—Electric Railway Association of Equipment Men, Southern Properties, Roosevelt Hotel, New Orleans, La.**

***Jan. 26-27*—Central Electric Railway Association, Hotel Gibson, Cincinnati, Ohio.**

***Jan. 31*—New York Electric Railway Association, annual meeting, Hotel Commodore, New York, N. Y.**

***Feb. 13-17*—American Institute of Electrical Engineers, winter convention, New York, N. Y.**

***Feb. 17-18*—Central Electric Railway Accountants' Association, Hotel Gibson, Cincinnati, Ohio.**

***May 2-5*—Southwestern Public Service Association, Dallas, Texas.**

***May 6-12*—Union Internationale de Tramways, de Chemins de Fer d'Interet Local et de Transports Publics Automobiles, annual meeting, Rome, Italy.**

***June 6-8*—Canadian Electric Railway Association, annual convention and exhibits, Toronto, Canada.**

***July 8-12*—Public Utilities Advertising Association and International Advertising Exposition, Detroit, Mich.**

SEPT. 22-28, 1928

American Electric Railway Association, 47th annual convention, Cleveland, Ohio.

Details Arranged for C.E.R. Master Mechanics Association

THE program for the meeting of the Central Electric Railway Master Mechanics Association is as follows:

WEDNESDAY, JAN. 25, 1928

9:30 A.M.—Address of the president, George R. Green, general superintendent Chicago, South Bend & Northern Indiana Railway.

"Variable Load Brake," by J. S. Y. Fralich, Westinghouse Traction Brake Company.

Discussion.

"W-N Drive and High-Speed Traction Motors," by W. J. Clardy, Westinghouse Electric & Manufacturing Company.

Discussion.

"Slide Rule and Calipers" (luncheon talk), by E. H. Arnott, Central Service Bureau.

"Railway Roller Bearings," by M. S. Downes, Timken Roller Bearing Company.

Discussion.

Reports of committees.

Round-table—General discussion.

Election and installation of officers.

Adjournment.

8:30 P.M.—Meeting of executive committee of Central Electric Railway Association.

Toronto Selected for Canadian Meeting

TORONTO has been selected as the location for the 1928 convention of the Canadian Electric Railway Association. The dates are June 6, 7 and 8. As in previous years there will be an exhibit of electric railway supplies.

Southern and Southwestern Equipment Men to Meet Jointly

INVITATIONS have been sent out for the thirteenth semi-annual meeting of the Electric Railway Association of Equipment Men, Southern Properties, to be held in New Orleans, La., at the Roosevelt Hotel, Jan. 25-27. This will be a joint meeting with the mechanical division of the Southwestern Public Service Association.

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News of the Industry

Ten-Cent Cash Fare Suggested in Dallas

Officers of the Dallas Railway & Terminal Company, Dallas, Tex., filed with the Mayor and Board of Commissioners of the city on Jan. 9 an application for an increased fare, in which they set forth fully the conditions which make such fare necessary.

Feeling that the patrons of the company, and the citizens of Dallas generally, are directly interested, the application was made available to the public in full.

The proposed schedule of fares recognizes the fairness and justice of charging a ticket rate substantially less than the cash fare rate, thereby providing service to the regular and habitual rider at a rate less than that charged to the transient or casual rider. A statement by the company says:

> The company is desirous that the citizens of Dallas, and particularly its patrons, acquaint themselves with the conditions which made this application necessary, and accordingly it extends to every citizen an invitation to request such additional information on the subject as may be desired, as it feels that a lack of mutual understanding will be responsible for whatever difference of opinion may exist.

In its plea the company "respectfully requests that your honorable body establish such new schedules of rates as will accrue in the reserves of the company amounts sufficient to enable it to make the necessary repairs as they accrue; to replace its property when and as it becomes exhausted, inadequate or obsolete; and at the same time to maintain said reserves at normal, as contemplated by its franchise."

The rates suggested tentatively are a 10-cent cash fare for adults, with five tickets for 35 cents; students' tickets at 4 cents and children five to twelve years old at 4 cents.

Third Arbitrator Wanted in Chicago

Following a series of wage conferences between Guy A. Richardson, vice-president, representing the Chicago Surface Lines, Chicago, Ill., and Alderman Oscar Nelson, representing the trainmen's union, announcement was made on Jan. 10 that the two men were unable to agree and would immediately begin considering the selection of a third man.

Under the terms of the arbitration agreement signed Messrs. Richardson and Nelson were to proceed to consider the terms of an arbitration of the demands of the union for a wage increase of 15 cents and for life and sick benefit insurance, as well as the suggestion of the company for a decrease of 5 cents in the present wage scale. Upon agreement they would have been authorized to extend the agreement to June 1, 1930.

In the case of disagreement, however, they were to proceed at once to select a third man to complete the board of arbitration, and in this event any agreement reached would cover only the present fiscal period ending June 1, next.

Experimental Rates in Santa Barbara

Following a study of the Santa Barbara & Suburban Railway increased rate case the California Railroad Commission found on Jan. 3 that the situation calls for a trial of experimental rates to determine whether or not any fare structure could be devised which will make it possible to continue the service. The company was directed to file within five days the following schedule of fares for its rail and bus system: Single cash fare to the holder of an identification card, 5 cents; individual weekly identification card, 25 cents; individual identification card for a longer period than one week, at the fare of 25 cents a week or such lesser fare as the company may fix; single cash fare, 10 cents.

In ordering the experimental rates which will provide a 5-cent fare to the holder of a weekly identification card costing 25 cents, the commission said that the consensus of opinion was in favor of first trying a 10-cent fare with a 25-cent weekly identification card or pass entitling the holder to a 5-cent fare.

According to the commission, the argument in favor of this form is that the regular rider, depending upon the number of times he rides, may enjoy a fare approximating the one now in effect. This plan has the added advantage of doing away with the multi-coin fare which slowed up traffic and irritated the rider.

Chaos Again in Columbia

Approximately 60,000 people are without dependable transportation system. City Council favors return of street car. Jitneys running sans schedule and sans route

AN EMERGENCY state in the transportation muddle in Columbia, capital of South Carolina, was reached recently when the buses of the Carolina Transit Company, 21 all told, were sent to Charlotte, N. C., where they were put in storage, leaving the Columbia field to the unregulated jitneys. A year ago Columbia offered a choice of three modes of transportation to its citizens—one could ride on street cars, buses or jitneys—the fares amounting to about 10 cents in each instance. Now only one system remains, that of the jitneys, which have no definite schedule, operate over no definite route and are withdrawn from the streets at the pleasure and whim of the owners. These vehicles are owned by individuals.

The many incidents in Columbia's transportation muddle, becoming more complex since last March, when the Columbia Railway, Gas & Electric Company stopped the operations of its street cars on the ground of lack of patronage, have been reviewed from time to time in these pages. Early, in December, 1927, the Carolina Transit Company and a bus manufacturing company made a proposition to the Columbia City Council to operate the street cars in conjunction with the buses. The Council, feeling that the Broad River Power Company, which has the franchises for furnishing light, power and gas to the city, should also operate the street cars, looked with disapproval on the proposition.

Late in December a representative of the bus manufacturing company went to Columbia, sales of "token" used in lieu of fares were stopped, employees were released and on the last night of the year of 1927, a few minutes after midnight, the buses, in a long caravan, left the city for Charlotte. Columbians awoke on the dawn of the New Year with no system of public transportation other than that furnished by the jitneys. The proposition made to the Council for the operation of buses in conjunction with street cars was withdrawn.

Last summer the Council passed an ordinance regulating the jitneys, prescribing routes and schedules for them. The jitney union at once instituted legal proceedings to have the ordinance declared unconstitutional, and the case was taken to the State Supreme Court, where it now rests.

The City Council has taken the position that street cars offer the best and most satisfactory system of transportation and it is now considering passing another ordinance having to do with transportation, an ordinance separate and independent from that now before the Supreme Court. Its intention is to force the Broad River Power Company to run the street cars.

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Decision in Labor Injunction

New York court returns case with suggestion of possible modification of sweeping terms

THE New York Court of Appeals on Jan. 10 suggested possible modification of the injunction issued by the New York Special Term in the case of the Interborough Rapid Transit Company, New York City, against Edward P. Lavin, Harry Bark, Joseph G. Phelan and James F. Walsh, restraining them from interfering with the employees of the Interborough and inducing them to join an association of railway employees secretly. The court held that an injunction for some part of the relief prayed for is justified by the record and sent the case back to the Special Term "in order that it may exercise its discretion as to whether an injunction of more limited scope should be issued."

EXTRACTS FROM COURT OPINION

After discussing the contractual relations of employee and employer Judge Lehman wrote:

Where employees have freedom of choice a labor union may not be accused of malicious interference when it urges the employees to make that choice in its favor; even though the choice may involve termination of present employment and consequent disruption of a business organization.

The defendants have the right to induce the plaintiff's employees to join the Amalgamated Association, though that may involve termination of their employment. They are under no obligation to the plaintiff to inform it that some of the plaintiff's employees are joining the union, so that the plaintiff may exercise its choice of retaining or discharging the new members.

Though we have decided that the defendants may not be enjoined from inducement by lawful means to leave the service of the plaintiff or to join an organization of employees other than the brotherhood or to make demands upon the plaintiff for increased wages, yet even such purposes may not be effected by unlawful means.

The defendants may not without the permission of the plaintiff enter upon plaintiff's property or place any signs thereon for the purpose of inducing even lawful action on the part of the employees. The defendants may not achieve their purpose by malicious falsehood and deceit. They may not use force or intimidation.

Though the court at Special Term would have been justified in issuing an injunction against any threatened use of unlawful means, even to achieve lawful end, and though we leave open the question of whether the defendants may be enjoined from inducing the plaintiff's employees to conceal from the plaintiff that they had joined the Amalgamated Association, the injunction, as issued, was beyond the power of the court.

Under these circumstances the orders should be reversed and the motion remitted to the Special Term in order that it may exercise its discretion as to whether an injunction of more limited scope should be issued upon the facts contained in this record.

After the strike of Interborough employees in 1916 a voluntary unincorporated association was formed under the name of the Brotherhood of Interborough Rapid Transit Company Employees. Substantially all 14,000 employees of the company joined the brotherhood. In 1926 the defendants were members of the General Committee of the brotherhood. On July 1, 1926, a group of the employees by a vote of 579 to 7 rejected a proposal that the wages and working conditions should remain unchanged.

The following day the men, through Lavin, demanded an increase in pay. On July 6 a strike started, lasting until July 30. The four individuals named by the company were leaders in the strike movement. It was charged they sought to have the men join the Amalgamated Association.

The Interborough then brought this action to secure an injunction which would in effect prohibit the defendants Lavin and others from inducing Interborough employees by lawful or unlawful means to leave the company's employ. An injunction in its broadest terms was granted.

Nathan D. Perlman of counsel for the Amalgamated Association said on Jan. 10 that the decision of the Court of Appeals was in the first injunction action brought by the Interborough Rapid Transit Company to prevent unionization of its employees, but added that he believed it would have an effect on the decision in the company's second injunction action, which will be argued before Supreme Court Justice Isidore Wasservogel on Jan. 23.

Ford Studies Transportation of Its Men

Following studies conducted at the River Rouge plant of the Ford Motor Company to determine the best method of providing for the transportation of 45,000 men moving in and out of the plant three times a day it has been decided that the best method will be to provide loading and unloading facilities on the company's property so that cars and buses can handle employees. The problem involves a movement of this large number of employees within a period of approximately a half hour.

Parking in Chicago Restricted

The elimination of parking in the Loop district of Chicago, Ill., became effective Jan. 10. Parking is forbidden on weekdays between 7 a.m. and 6:30 p.m. in the entire congested area of the central business district. During these hours passenger motor cars are permitted to stop at curbs only long enough to discharge and receive passengers. Taxicabs are permitted to park only at authorized cab stands, and only the authorized number of cabs are permitted in these stands. Delivery trucks are permitted to use the curb space for not more than one-half hour for loading and unloading purposes. A fine of $1 to $25 for each offense is provided by the ordinance. The ordinance is not in effect on Sundays and holidays, and on Saturdays parking is permitted after 3 p.m.

Bus Operators an Issue in Pennsylvania Strike

Insistence of trainmen to have the word "subsidiary" inserted in a wage agreement resulted in a strike on Jan. 6 on the lines of the East Penn Railway between Tamaqua and Mauch Chunk, Pa. The word "subsidiary" would cover buses, which are to be used as feeders for the railway lines and under it the bus drivers would be required to become members of the union.

Weekly Pass Replaces Permit Card at Halifax

The Board of Commissioners of Public Utilities for Nova Scotia has approved the application of the Nova Scotia Tramways & Power Company, Ltd., to change from a 5-cent permit card to an unlimited ride, transferable weekly pass. The permit card was adopted by the former management on June 1, 1924, on the occasion of going from 7 cents cash and seventeen tickets for $1 to 10 cents cash and six tickets for 50 cents. Permits were sold at the rate of $1 a month for all hours and 50 cents a month for specified off-peak hours. The permits were also sold at diminishing rates throughout the month, so that an all-hour permit cost only 60 cents after the fourteenth day of the month, while an off-peak permit was then obtainable for 30 cents.

From March, 1925, the company sold the 8½-cent tickets at three for 25 cents and during 1926 it added a thirteen-rides-for-$1 ticket book. The new schedule calls for an unlimited-ride weekly pass for $1.25 and a ticket rate of fourteen for $1 in book form.

Zone Limits at Wilkes-Barre Approved

The Public Service Commission has refused in an order to force the Wilkes-Barre Railway, Wilkes-Barre, Pa., to revise its rate schedule on the branch between Wilkes-Barre and Sugar Notch Borough. The borough filed a complaint with the commission in Harrisburg alleging that the service maintained was inadequate and that the fare charged was unjust.

In its decision the commission dismissed the allegation on the inadequacy of service without much discussion. The section between Sugar Notch and Wilkes-Barre city is divided into two fare zones, with an average length of 2.98 miles each. Other zones on the line the commission found in its study to be approximately the same length.

The commission said it was obvious that zones on a railway system could not all be the same length. The zoning system on the Wilkes-Barre railway lines has been in effect for many years and the commission said it found nothing to indicate that the zones on the lines are unjustly discriminatory or an abuse of managerial discretion.

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New Fares in Effect in Council Bluffs

All cars of the Omaha & Council Bluffs Street Railway, operating in Council Bluffs, Iowa, left the carhouse on Dec. 31 with prominent placards announcing a new 10-cent fare effective at once. The 10-cent fare decision was referred to in the ELECTRIC RAILWAY JOURNAL, issue of Dec. 10. The new rates are as follows:

	Cash	Ticket
Council Bluffs, local—adult	10c	6 for 40c
Council Bluffs, local—child	5c	10 for 35c
Omaha-Council Bluffs	10c	10c
Omaha-Council Bluffs—commutation	..	30 for $2.25
Council Bluffs-Iowa School for the Deaf—adult	10c	Round trip 15c
Council Bluffs-Iowa School for the Deaf—child	..	Round trip 10c
Omaha-Iowa School for the Deaf—adult	..	Round trip 25c
Omaha-Iowa School for the Deaf—child	..	Round trip 15c

In the Jan. 1 issue of *Street Car Topics*, published by the Omaha & Council Bluffs Street Railway, an explanation is made by the company for the necessity for an increase in fare. It was the conclusion of the company that it was best to establish the same rates in Council Bluffs as are in effect in Omaha.

W. Winans Freeman Wins McGraw Award

Electrical men paid tribute to W. Winans Freeman Jan. 10 at a dinner given at the Hotel Roosevelt, New York, on the occasion of the presentation of the James H. McGraw Award medal for co-operation. Prominent executives numbering 300 from Eastern points and as far west as Chicago, gathered to express the approval of the industry of the outstanding service rendered by Mr. Freeman in accomplishing the reorganization of the Society for Electrical Development, by which its directorate has been made officially representative of the major national associations of the industry. It was in recognition of this that the medal was awarded.

P. G. Gossler, president of the Columbia Gas & Electric Company, paid a personal tribute to Mr. Freeman, and Owen D. Young, chairman of the General Electric Company, eulogized the practical ideal which is the basis of the McGraw Award, the recognition of the service of individuals in the advancement of the industry.

In responding, Mr. Freeman dwelt upon the promise of broadened opportunity now opened to the electrical industry through the closer unity that has been effected between the national associations. He modestly insisted that the credit for the accomplishment should go to his associates on the directorate of the society and to the staff.

Mr. Freeman was selected for the award by judges representing the four branches of the industry—J. E. Montague, S. L. Nicholson, G. E. Cullinan and James R. Strong.

Mr. Freeman is chairman of the Union Gas & Electric Company of Cincinnati, vice-president of the Columbia Gas & Electric Company, New York, and for eight years has been president of the Society for Electrical Development.

Seattle Will Not Borrow from Peter to Pay Paul

By a vote of five to one, a group of City Councilmen who attended a conference called by Mayor Bertha K. Landes of Seattle, Wash., disapproved of a plan to loan funds of the city Light Department to the Municipal Railway, to permit cashing about $121,000 in payroll warrants to be issued on Jan. 10. The Light Department has approximately $400,000 derived recently on a bond sale, lying in banks at 2 per cent, and the plan was to loan that to the Railway Department at the 5 per cent the payroll warrants will bear until paid. Councilmen took the stand that it would be "foolish to make one utility carry another."

The plan to effect a loan from the city light funds to aid the Municipal Railway in meeting a payment of more than $1,000,000 due next March on the purchase of the railway from its private owners developed controversy among members of the City Council.

A resolution adopted by the Clearing House Association last year declaring against all warrants is still standing, but individual members of the association have stated they will take the payroll warrants.

A group of representative Seattle business men and real estate operators appeared before the utilities committee of the City Council recently protested again the Council acting favorably on two propositions under consideration for providing aid for the municipal railway from the general fund. The committee had before it two bills, both of which were drawn up to place them on the ballot at the city election on March 13. The bills, prepared by Councilman E. L. Blaine and Oliver T. Erickson, are alike with the exception of a 5-cent fare proposal contained in Mr. Erickson's measure. Both measures provide a limit of 3 mills in the tax levy for railway aid. According to estimated valuations for next year, the levy would yield between $800,000 and $900,000 for the railway.

Mr. Erickson stated that his measure was offered as first aid, and not a solution, for the serious problem in which the railway finds itself. He said:

> Anything the citizens' committee would recommend could not be put in effect for two years. If the present situation continues, we might as well take the cars off.

At a meeting in the Rainier Valley District, business men of that section went on record as strongly opposing any attempt to return to 5-cent fare on the municipal railway, pointing out that it was impossible for the Seattle & Rainier Valley Railway to reduce its fares.

Plan Petition to Governor for Chicago Traction Session

Circulation of a petition asking Gov. Len Small to convene a second special session of the state Legislature for the purpose of granting the city of Chicago the necessary enabling legislation to clear up the long-pending local transportation problem is proposed in a call for a meeting of the City Council committee on local transportation on Jan. 16, recently issued by Chairman Joseph B. McDonough. If the plan is approved, Alderman McDonough declared, a canvass will be started at once to obtain 100,000 signatures among the civic, business and labor organizations of the city.

While the merits of this proceedure were being discussed by city officials, rumors began to filter in from Springfield that the Governor, of his own accord, may still decide to summon another special legislative session to deal with the Chicago traction program. He failed to include traction in the business of the current special session which convened Jan. 10.

At the Jan. 16 meeting Alderman McDonough expects the five transit bills embodying the needed legislation to be presented in final form. Following a meeting with company representatives early last month, the bills were handed back to the city attorney and a sub-committee for certain minor changes.

Membership of Legislative Committees Announced in New York

John M. Hackett, Poughkeepsie, again heads the public service committee of the Assembly, in the appointments handed down by Speaker Joseph A. McGinnies of the Assembly on Jan. 9. To this committee is referred all bills relating to public utilities and amendments to the public service commission law. Other members of the committee include Catchpole of Ontario, Pammenter of Monroe, Grenthal of New York, Stephens of Putnam, Munsel of Clinton, a new man succeeding Winters of Schuyler, who did not return to the Assembly; Fisher of Lewis, Dickey of Erie and Condon of Westchester, a new member succeeding Emerson of Jefferson, who did not return, Republicans, and Gillen of Kings, Ryan of Queens, Higgins of New York, succeeding Hayes of Albany, and Falk of New York, succeeding Dineen of New York, Democrats.

The Senate committee on public service remains the same as last year. The members include Warren T. Thayer of Chateaugay, chairman; Campbell of Lockport, Whitley of Rochester, Hickey of Buffalo, J. F. Williams of Troy, Pitcher of Watertown, Brereton of Essex County, Gates of Chittenango and Majority Leader John Knight of Arcade, Republicans, and Twomey of Brooklyn, Dunnigan of New York, Farrell of Brooklyn and Minority Leader of the Senate Bernard Downing, Democrats.

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Lengthening of Local I.R.T. Stations Ordered

An order directing the Interborough Rapid Transit Company, New York, N. Y., to begin work on the lengthening of four local station platforms was announced by the Transit Commission on Jan. 1. These stations are Canal Street, Spring Street, Bleecker Street and Astor Place on the Lexington-Fourth Avenue Line. In this order the commission states that the lengthening of local platforms has become necessary in order to afford adequate transportation. The order marks a new step toward carrying out the commission's order directing the lengthening of all the Interborough local station platforms to a size sufficient for the accommodation of ten-car trains.

Methuselah Lived 969 Years

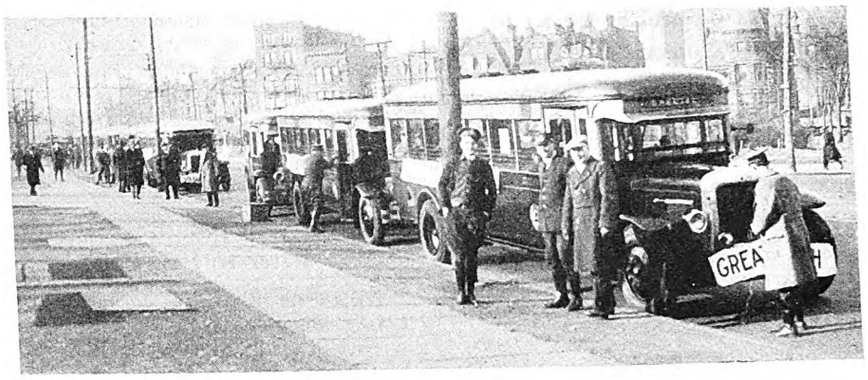
A pale yellow car lettered in green and red is used effectively as a safety car by the Jamaica Public Service Company in Kingston, Jamaica. An open car, at one time a familiar sight, is the first of its kind to be run on the streets of the island city. Spectators read with interest on the part just above the side step: "It is everybody's business to be careful" and on the letterboard "Methuselah was a careful man and he lived 969 years." The company on its regular trams also displays various accident prevention cards and slogans.

North Shore Line Freight Business Up 25 Per Cent

With the tonnage for the month of December estimated, the freight and merchandise dispatch traffic over the Chicago, North Shore & Milwaukee Railroad totaled about 825,000 tons in 1927 or an increase of 170,000 tons over 1926. This gain is due to the freight facilities afforded by the new Skokie Valley route, which has convenient connections with steam railroads for the interchange of cars.

Prior to the opening of the Skokie Valley route in 1926, the North Shore Line was unable to handle carload freight south of Highland Park because of franchise restrictions in the various municipalities through which it operates. The new high-speed double-track line, however, is constructed on privately owned right-of-way for its entire length. Since the opening of this route, fifteen large concerns dealing in coal, lumber and building materials have located their yards adjacent to its tracks and building operations have flourished.

Another improvement on the North Shore Line has been the development of door-to-door freight service between Chicago and Milwaukee. This service has proved popular with shippers of l.c.l. freight and has made for economy and efficiency in the handling of shipments. Merchandise is placed in steel containers and sealed at points of shipment. The containers, which are semi-steel trailers of 8-ton capacity, are hauled to the freight receiving station by tractors and there mounted on flat cars without removing the trailer wheels. On arrival at destination after an overnight haul the trailers are pulled by tractors direct to the door of the consignee before the seals are broken. New flat cars recently purchased by the railroad accommodate three trailers each.



Some of the buses in the parade in Newark on the day bonuses were awarded operators of the Essex Division

No-Accident Bonuses Awarded in New Jersey

A parade of fourteen buses containing trolley and bus operators marked the ceremonies on Dec. 19 in connection with the awarding of no-accident bonus prizes by Public Service Railway and the Public Service Transportation companies to operators in the Essex Division. The parade was from Lincoln Park to Public Service Terminal, Newark, where more than 800 operators gathered in the auditorium to receive their checks. The night operators received their bonuses in the morning and the day operators in the evening.

The no-accident bonus plan, put into effect in December, 1926, provided $1 a week for each week in the year in which the operator had no accidents. In all the divisions throughout the state $130,000 was distributed. In the Essex Division approximately $42,000 was awarded to 1,580 men.

President Thomas N. McCarter, introduced by James M. Symington, manager of the Essex Division, congratulated the men on their achievement and hoped they would receive larger checks next year. He emphasized the necessity of further co-operation on the part of the city authorities in stricter regulation of parking of private cars so that those who use the trolleys and buses, the great majority, may be transported safely, promptly and economically. Mr. McCarter asked Director of Public Safety William J. Brennan to co-operate to the fullest extent in his power in working out this problem.

Director Brennan also congratulated the operators on their showing under the no-accident plan and asked them to continue to give their best efforts in the cause of safety, guarding those who seem unable to guard themselves.

Fred M. Rosseland, executive manager of the Newark Safety Council, told what his organization is doing in the cause of safe transportation and Matthew R. Boylan, vice-president in charge of operation of the companies, praised the men for their records and asked them to be particularly careful at street intersections, as, he said, 63 per cent of all the accidents occurred at such points.

The playlet prepared by the safety education department, entitled "Whose Fault," was given at each session.

Group of Public Service railway and bus operators (Essex Division) in Newark Terminal auditorium during bonus award presentation

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Norfolk's Cars and Buses in New Colors

Virginia Electric & Power Company officials have pointed out the rainbow to the company's master painter and said in effect: "Turn us out some street cars and buses that look like that." Certainly, so far as Norfolk is concerned, the day of the banana-colored street car is over. As fast as the company's rolling stock needs repainting it will be given one or several coats to outshine Joseph's multi-colored one. All cars and buses may be made as gay as the red, white and blue equipment now in service on the Naval Base line at Norfolk. But all won't be red, white and blue. The ten new buses recently ordered by the company will wear a blue, cream and orange dress. Two of them are on their way to Norfolk and the other eight will soon follow. These buses will be used on the Colonial Place line, company officials have announced.

Resumption of Service Demanded of Columbus Interurban

Demand that service under the terms of its franchise be established in Hague Avenue between Broad Street and Sullivan Avenue is made on the Indiana, Columbus & Eastern Railway by City Attorney Leach of Columbus, Ohio. Service was discontinued by the Columbus Railway, Power & Light Company more than ten days ago. The local company had been supplying service for the interurban railway under a contract which has expired. Mr. Leach pointed out that the franchise held by the interurban railway calls for a fifteen-minute city service in those streets. The city attorney said he would wait several days for a definite answer to his demand.

German Visitor Impressed by Chicago Operation

Since the item was published in the JOURNAL for Nov. 19, in which he commented on the railway situation in the United States, particularly in Grand Rapids and Chicago, Herr R. Schwanter, well-known German engineer and assistant director engineer of the Cologne Municipal Railway, has amplified the remarks he made at that time about operation in Chicago and the system there. He said:

I had heard in Germany that the Chicago Surface Lines handled by far the most people in an area with a population of about 3,000,000 with insufficient rapid transit lines. In the Loop, which is the most congested area I have ever seen, street car after street car ran, not crept, sometimes even faster, especially as to acceleration, than competing double-deck buses. The utmost skill is shown in the operation of surface cars, manned by very polite trainmen.

Other interesting features of the Chicago operation were the famous co-ordinated traffic signal system—we say in Germany the "Green wave"—the systematic avoidance of disturbing left-hand turns, the highest average scheduled speed I know of, the densest train schedule, operating like clockwork and without trouble, cars in very good condition, a high standard of maintenance, a fair fare system with its allowance of several changes and last, but not least, the best buses.

I got the impression that there must be excellent co-operation among management, employees and the public. I am convinced, especially by the Chicago Surface Lines, that the day of the last street car is farther away than ever, if managements and employees do not lose courage and energy.

California Fare Hearings to Be Resumed

The third of a series of hearings before the California Railroad Commission on interurban rates for the Pacific Electric Railway, Los Angeles, Cal., will be held on Jan. 17. Since the last hearing, held in October, a comprehensive survey of the properties and the operation of the railway has been under way. Five engineers have been detailed by the Railroad Commission to make this survey.

Particular attention has been paid to the elimination of stops, to speed and to general service. Since the meeting in October more than 100 stops over the entire Pacific Electric system have been eliminated by the commission's recommendation. The commission has in a number of cases recommended an increase in the frequency of service which the company officials have not felt warranted because of inadequate returns from those lines. In no case has any evidence been discovered of wasteful practices.

The company is requesting a raise of approximately 20 per cent in all interurban fares. It bases its request upon the fact that it is not earning an adequate return upon its investment. The company has never paid a dividend. The Southern Pacific, the parent company, a few years ago wiped out a deficit of $15,664,884 accumulated since 1911, when the Pacific Electric was incorporated.

Railway Man to Promote Shipping Interest in Richmond

William E. Wood, president of the Virginia Electric & Power Company, Richmond, Va., has been appointed a member of the Richmond Port Commission. Fred H. Powell, president of the Richmond Common Council, named Mr. Wood, who is already a member of the James River improvement committee of the Chamber of Commerce. The port commission has been created to revive shipping interests of Richmond which in former years contributed largely to the city's commercial development. At one time Richmond's maritime activities extended to all parts of the world. A federal and local survey has recently been completed with the object of deepening the river's channel and providing extensive terminal improvements.

Company at Poughkeepsie Would Sell Right-of-Way for $150,000

The Board of Supervisors at Poughkeepsie, N. Y., has taken preliminary steps to obtain such special legislation as may be needed to permit the county, if it desires, to acquire the right-of-way of the Poughkeepsie City & Wappingers Falls Electric Railway for the widening of the South Road. This end was attained through the acceptance of a report of the board's highway committee on the offer of the railway to sell for $150,000.

The committee recommended that inasmuch as the board had received no information from the State Superintendent of Public Works concerning the reconstruction of the highway and had been furnished with no surveys nor preliminary plans specifying the lands to be needed, no action be taken at this time on the railway offer. The suggestion was made, however, "that the representatives of Dutchess County in the State Legislature attempt to procure any necessity legislation to authorize the Board of Supervisors of Dutchess County to ascertain the amount for which the right-of-way to maintain the trolley road between Wappingers Falls and Poughkeepsie would be abandoned and to appropriate such sums as the Board of Supervisors may determine to pay therefor."

Who Will Win American Waterworks Stock?

A stockholder of the American Water Works & Electric Company, Inc., the controlling company of the Monongahela West Penn Public Service Company, has offered a prize of five shares of common stock for the best article on "What Should My Company Mean to the Public?" Any employee of the American Water Works, or any of its subsidiaries, is eligible for the contest, with the exception of certain high officials.

The competition opened Jan. 10 and closes March 10. Essays must be limited to 1,500 words. Attached to the essay, but on a separate slip of paper, must be the writer's name and the company by which he is employed. The contestant's name, however, must not appear on the article itself.

Hearings on Boston "L" Legislation Begin Jan. 23

The legislative committees on metropolitan affairs and street railways, sitting jointly, have announced that public hearings on all proposed Boston Elevated Railway legislation will open on Jan. 23. The two committees have decided that the Elevated legislation, which is the most important problem before the General Court, should not be allowed to drag through the session, but should be taken care of in the early weeks of the year if possible.

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Utility Education in Illinois Public Schools

A total of 33,000 pamphlets on electric railways has been distributed to the schools of Illinois by the Illinois Committee on Public Utility Information. The pamphlet is a revision of similar pamphlets used with success in previous years. It contains a brief history of the development of electric transportation systems and explains in non-technical language the construction of electric street cars and the method of operation. This pamphlet is one of a series issued by the Illinois Committee covering the various public utility services.

Public school teachers and principals have found these pamphlets very valuable in practical instruction of their pupils on subjects relating to public utilities. In connection with the use of the pamphlet on electric railways the Illinois Committee makes some suggestions to school teachers and principals for formal or informal debating and for rhetoric, oral English and current topics classes.

Information Service in Baltimore

As a further aid to the public, the United Railways & Electric Company, Baltimore, has established an information service on the ground floor of the Continental Building, in the heart of the downtown section. This bureau also receives complaints. It was deemed advisable to open the bureau because the offices of the company are scattered on several floors of the building and a person seeking a certain department often experiences difficulty in finding the proper office. At a later date the company expects to enlarge the new department for the sale of car checks and commutation books.

Gary Paper Makes Appearance

Establishment of an employee magazine to be known as the *Treadle* has been announced by the Gary Railways, Gary, Ind. Beginning with the December issue, the new publication will make its appearance monthly, being distributed to each of the 350 employees. The first issue, of four pages, carries news of safety committee work, a new employee training course in elementary electricity, editorials and extensive department personals. It is made up in newspaper style with three columns to the page. Margaret K. Hanlan is the editor.

Service Records in Jackson Rewarded

Service buttons were recently delivered by the Jackson Railway & Light Company, Jackson, Tenn., to 40 of its employees who had been with the company five years and more. Two of the buttons went to men who had been on the payrolls for a quarter of a century, two were for twenty years' service, seven were for fifteen years, nine for ten years, and the remainder for five years.

The 25-year and twenty-year buttons were of gold, the ten and fifteen-year buttons silver and the five-year buttons were bronze. A presentation speech was made by John Wisdom, general superintendent, who drew a 25-year button for his own services.

City Seeks to Recover From the Interborough

Formal approval of a claim against the Interborough Rapid Transit Company, New York, in favor of the city for $9,783,770 was contained in a resolution adopted on Jan. 4 by the Transit Commission. The commission's action is equivalent to starting proceedings to recover this sum, as the amount in question is now automatically placed in a suspense account pending determination by the courts or arbitrators of the merits of the claim. The amount consists of sums charged against operation of the subways and the so-called certificate roads, extensions of lines covered by the dual contracts, which accountants for the Transit Commission contend are improper charges. The position of the Interborough Rapid Transit Company in the matter has been stated previously in the ELECTRIC RAILWAY JOURNAL.

St. Paul Fare Hearing Deferred

Hearing by the Minnesota Railroad and Warehouse Commission of the application of the St. Paul City Railway, St. Paul, Minn., for increase in rate of fare was postponed on Jan. 5 until April 30. The action was asked by Corporation Counsel A. A. Stewart on the ground that the voters will hold a special election on March 13 on a charter amendment to permit the Council to effect relief from certain expenses of the railway such as was recommended at the time the commission announced a valuation and a rate of fare of 8 cents cash and six tokens for 40 cents. Voters have hitherto turned down similar proposed amendments. The property valuation was placed in 1925 at $16,000,000 and the return authorized at 7½ per cent.

Pierce Butler, Jr., representing the city, said the city is acting in bad faith as at the election a proposal will be considered for a municipal bus line, of which business the Twin City Motor Bus Company now has a monopoly. Chairman O. P. B. Jacobson of the commission said leaders for the city in the controversy had estimated the railway property valuation at $9,000,000, and that he intends to find the basis for the figure and reasons for making it public. The proposed relief includes freedom from the cost of paving and maintenance of paving between car tracks and sprinkling amounting to several thousand dollars a year.

Why Only Ten Years More of Life for "Jim" Couzens?

If next August finds him among us mortals, James Couzens, United States Senator, one-time Mayor of Detroit and municipal railway advocate, will have lived one of the last ten years he desires. At least he is reported to have said on his 55th birthday that ten years more of life would be enough for him. His viewpoint is accounted for in the January, 1928, number of *McClure's Magazine* by Allan L. Benson, by whom Mr. Couzens is taken to task.

Railway people remember "Jim" Couzens as that successful young man who resigned as vice-president and general manager of the Ford Motor Company to become president of the Detroit Street Railway Commission, as that fiery municipal railway devotee who later negotiated the sale of electric railway lines to the city and who after serving as Mayor of that city resigned to accept an appointment to the United States Senate in 1922 made by the Governor of Michigan to fill the vacancy caused by the resignation of Senator Newberry.

Mr. Couzens' complaint is that he got out of his element too suddenly, dropped business too early and found too much time with little to do with it. His rise from a car checker in the Michigan Railroad yards at $60 a month to general manager of the Ford company at $150,000 a year covered only a few years in the span of a lifetime.

The writer of the article, who grew up with Mr. Couzens, rejects the philosophy "it is too late to begin" and says it must be exterminated from every life, whether the age be 35, 45 or 55. It is not too late for Mr. Couzens to develop new interests. He who made Detroit a better place in which to live, who devoted much money and time to public service must not relax. As Arthur Brisbane said about him many years ago, "Young in his early 40's, he has many years of useful work ahead and he intends that they shall be working years."

Three-Cent Mileage Rate Sought on Warren & Jamestown

The Warren & Jamestown Street Railway, operating between Jamestown and Warren, N. Y., petitioned the Public Service Commission on Jan. 10 for authority to increase its mileage rate to 3 cents in place of 2½ cents and by increasing the number of fare zones, each with a 5-cent fare. Because of the extensive increase in the number of privately owned automobiles and highway development between Jamestown and Warren the company complains there has been a large decrease in the number of passengers it handles, with consequent loss to the company.

The increase requested by the company is approximately 20 per cent over existing fares. A similar application has been made to the Pennsylvania Public Service Commission.

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Recent Bus Developments

Houston's Harrisburg Service to Begin Soon

Express buses to Harrisburg from Houston, Tex., will be put into operation about Jan. 15, Carl Frazer of the Houston Electric Company has announced. Eleven of the fifteen new buses for use on the line had arrived on Jan. 6 and the remaining four were expected at once. The downtown terminus of the Harrisburg line will be at San Jacinto and Preston. There will be express service from Milby to the Harrisburg terminus. The tentative arrangement calls for five to seven-minute service during the rush and ten to eleven-minute service for the off hours. The Harrisburg railway line from 67th Street to the present terminus near Brays Bayou will be retained for several weeks. It is planned to remove the tracks from 67th Street to the terminus when the bus service is perfected.

Appeal on Hoosier Transportation Rights

Notice of the appeal from the decision of the Indiana Public Service Commission to the Superior Court in Indianapolis on the petition of the Hoosier Transportation Company, Inc., for authority to pick up and discharge passengers on West Washington Street inside the city limits of Indianapolis has been filed with the secretary of the commission. The commission recently denied the petition after hearings, during which the Indianapolis Street Railway opposed the plea.

Worcester Consolidated Considers Bus Fare Protest

Residents of Fisherville, Mass., have entered a protest against the bus fare charged by the Worcester Consolidated Street Railway on the line between Wilkinsonville and Fisherville. The fare at present between these points is 20 cents and the distance is about 2 miles. Officials of the railway have taken the protest under advisement.

Substitution of Buses on Providence Line Denied

The petition of the United Electric Railways, Providence, R. I., to abandon railway service between Pascoag and Woonsocket and substitute buses has been denied by the Public Utilities Commission. In summing up the evidence presented at hearings on the company's petition to abandon service to Woonsocket and Pascoag, Chairman Bliss remarked that "if there is a general policy of this company that is in the public interests it should be disclosed in this case as in all other cases." The commission said:

It does not seem to the commission on the facts presented that the petitioner has made out a case of public necessity and convenience, and we do not feel justified in depriving communities of the service in which the town councils are a unit in opposing this move.

The company witnesses testified that this line has shown a loss for a considerable period and that this company believed that bus operation would be profitable.

Business of Gray Line at Toronto Grows

The Toronto Transportation Commission, Toronto, Ont., is doing its share in bringing United States visitors to Toronto by the motor coach service to Niagara Falls and Buffalo. The revenue which Gray Coach Lines, Ltd., received from the Niagara Falls and Buffalo service in October was three times as large as in October, 1926, and in November it was more than four times greater than in the similar month last year.

Shore Line Coach Sold

Routes, station facilities and other holdings of the Shore Line Motor Coach Company, north of the city of Benton Harbor, Mich., were sold recently to the Motor Transit Corporation, Chicago, which operates the Safety Motor Coach Company, the Purple Swan Motor Coach Line and other interurban bus services in the Central West. The Shore Line Motor Coach Company is controlled jointly by the Chicago, South Shore & South Bend Railroad and the Gary Railways. Included in the sale was the Golder Arrow Motor Coach route, over which a de luxe non-stop service is maintained between South Bend, Ind., and Detroit. The Southwestern Michigan Motor Coach Company, Kalamazoo, which has been under the same general management as the Shore Line Company, was also purchased by the Motor Transit Corporation.

With the consummation of the sale on Dec. 31, the operations of the Shore Line Motor Coach Company became confined to northern Indiana and southwestern Michigan, where local permits and franchises are held. The company discontinued its service as of Jan. 1 connecting Benton Harbor, South Haven, Holland, Grand Haven and Muskegon. The Shore Line system consists of extensive motor coach routes in northwestern Indiana adjacent to Chicago. Local transportation is rendered in Hammond and between that city and Chicago, East Chicago, Whiting and Chicago Heights, Ill. Service is also furnished between Gary and Chicago, Gary and Michigan City, Gary and Valparaiso and Michigan City and Benton Harbor.

Shore Line Motor Coach service between Chicago and Benton Harbor will continue to be operated in conjunction with the fast limited train service of the South Shore Line. Shore Line Motor Coach passengers have the option of making the trip between Chicago and Michigan City, en route to Benton Harbor, on the electric interurban railroad, thus saving an hour in time.

Fares Equalized in California City

A certificate has been granted by the California Railroad Commission to the San Diego Electric Railway to operate auto passenger service between San Diego and El Cajon and intermediate points and to increase the fare from Lookout Avenue to Grossmont from 5 cents to 10 cents, and between Lookout Avenue and El Cajon from 15 cents to 20 cents. Other fares will be equalized.

Buses Soon Over Morris County Route

The first of the buses to be substituted for the cars of the Morris County Traction Company between Newark and Lake Hopatcong, N. J., has been received at Dover. O. G. Schultz, general manager of the company, said he expected the other buses before Jan. 15. If favorable action is taken by the Public Utilities Commission on the company's application to run the buses between Maplewood and Newark and for location of a terminal at Park Place, opposite the Hudson Tubes in Newark, Mr. Schultz said it was planned to begin the Morristown-Newark service as soon as the buses are ready. The Morristown-Lake Hopatcong line will begin operation shortly thereafter. Between Summit and Newark there will be a fifteen-minute schedule and an express service is to be maintained between Newark and Maplewood. It is expected there will be a shortening of time in the bus schedule as compared with that now followed by the cars. The bus schedules are being worked out.

Would Transfer Olean Bus Franchise

The Olean, Bradford & Salamanca Bus Line, Inc., holding certificates to operate in Salamanca, between Olean and the New York State line via Limestone, and between Bradford, Jamestown and Salamanca, applied on Jan. 6 to the Public Service Commission for authority to transfer its franchises and property to Alvin R. Bush, Phillipsburg, Pa. The petition states that all of the capital stock of the bus line is owned by the Olean, Bradford & Salamanca Railroad and that the bus line does not possess funds necessary to maintain, improve and operate the bus line.

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Financial *and* Corporate

Merger in New Jersey

Bus and railway lines of Public Service Corporation to be consolidated under title "Public Service Co-ordinated Transport"

THE directors of Public Service Railway and of Public Service Transportation Company, Newark, N. J., have approved an agreement of consolidation and merger which will be submitted to the stockholders of the two companies for their action at meetings to be held on Jan. 31.

A new company is to be created, known as Public Service Co-ordinated Transport. Provision is made for the issuing of 2,500,000 shares of no par value common stock and 487,500 shares of non-cumulative preferred stock of no par value, which will have no voting rights but will receive dividends at the rate of $6 per annum per share, for such years as in the judgment of the board of directors such dividend is justified and before dividends are paid on common stock. In the event of the dissolution of the company its preferred stock is to be entitled to a division of the assets at the rate of $75 a share, before the common stock receives any part of the assets.

PRESIDENT MCCARTER COMMENTS ON CHANGE

Under the terms of the agreement the 487,500 shares of no par value common stock of Public Service Railway outstanding will be exchanged for 487,500 shares of non-cumulative preferred stock of Public Service Co-ordinated Transport, and the 1,004,500 shares of common stock of Public Service Transportation Company outstanding for the same number of shares of common stock of the new company.

Thomas N. McCarter, president of Public Service Railway and Public Service Transportation Company, said in reference to the merger:

> The consolidation of Public Service Railway and the Public Service Transportation Company into Public Service Co-ordinated Transport is a forward step in improving local transportation conditions. It will, in the opinion of the directors of the two companies to be merged, accomplish two important objects. First, a further co-ordination of street car and bus service with resulting economy and efficiency, and, second, an improvement of financial structure, including the possibility of an open end mortgage, which will make it easier to secure new capital for extension and betterment of facilities. The merger of Public Service Electric Company, Public Service Gas Company and United Electric Company of New Jersey into Public Service Electric & Gas Company has demonstrated the benefits of this character of consolidation, which is in the interest of the public as well as the stockholders.
>
> The large increase in the number of passengers carried by Public Service cars and buses during 1927 demonstrates the demand for adequate transportation facilities, and experience gained through the operation of both kinds of vehicles shows clearly that co-ordination of service is necessary in order to meet these demands adequately. This co-ordination, the merger of the two companies will assist in securing.

Traffic, Fare and Wage Figures

No reduction in the rate of decrease of electric railway traffic during November, 1927, was noted. Compared with a similar month of 1926 the rate of decrease is somewhat greater than reported in the previous months of the year, with the exception of July. The number of revenue passengers, including bus passengers, reported by 190 companies for November, 1927, compared with November, 1926, is as follows:

November, 1927	759,463,443
November, 1926	779,126,980
Decrease, per cent	2.52

The average cash fare in cities of 25,000 population and over:

	Cents
Dec. 1, 1927	7.9993
Nov. 1, 1927	7.9846
Dec. 1, 1926	7.7643

Average maximum hourly rates paid motormen and conductors in two-man service by companies operating 100 or more miles of single track:

	Average Hourly Rate Cents	Index Number 1913 = 100 Per Cent
Dec. 1, 1927	57.27	210.17
Nov. 1, 1927	57.27	210.13
Dec. 1, 1926	56.88	208.73

Winona Line to Issue $260,000 Notes

Authority to issue and sell $260,000 of its 6 per cent ten-year gold notes was granted the Winona Railroad, Warsaw, Ind., on Dec. 31 by the Indiana Public Service Commission. Under the terms of the commission's order, the securities are to be sold at 94 per cent of their par value. Proceeds from this sale will go to reimburse the railroad's treasury for additions to properties already made.

Tulsa Tax Claim Settled

Tulsa, Okla., presented the Tulsa Street Railway with a receipt in full for more than $30,000 of long overdue franchise taxes in exchange for a check for $3,000. In return, the railway agreed to remove immediately the block to progress which has existed on the east side of the city since 1914. The company will lay new double tracks and pave its portion of the street for the unpaved distance of six blocks. New 80-lb. steel rails will be used. Franchise taxes have been accumulating for several years, but the company has been unable to pay them. The recent increase in fares enables the company to pay expenses and make some necessary improvements.

Financing Plans Completed at Alliance

Plans for refinancing the Stark Electric Railroad and retiring an old bond issue were approved at a special meeting of stockholders held recently at the railway offices in Alliance, Ohio. The refinancing will be done with a $500,000 7 per cent bond issue and $250,000 of preferred stock, both of which were approved by the Ohio Public Utilities commission.

Directors of the Stark Electric were authorized to proceed to complete a contract between the Stark Electric and the Alliance Power Company, so they may be submitted at the annual meeting of the stockholders to be held on Jan. 19. The Alliance Power Company, organized several months ago, has taken over and is operating electrical generating equipment formerly owned by the Stark Electric. State commission officials have approved the proposed contract, which includes an easement right-of-way from Louisville to Damascus, a distance of 16 miles, to be purchased from the railway for $22,500.

Amusement Plot Sold by Tri-City Railway

The Tri-City Railway, owner of the Black Hawk Watch Tower at Rock Island, Ill., has sold the 177-acre tract to the state of Illinois for $200,000. The state will convert the plot into a park preserve similar to Starved Rock. The railway at one time operated the property as an amusement center.

Confirmation of Twin City Details Sought

The annual meeting of the stockholders of the Twin City Rapid Transit Company, Minneapolis, Minn., will be held at Jersey City, N. J., on Feb. 28, 1928. At this meeting officers will be elected and other business transacted, including such action as may be necessary or convenient legally to prevent any sale or transfer, pledge, hypothecation or other encumbrancing of the shares of stock of the Minneapolis Street Railway and the St. Paul City Railway, owned by the company, or any interest therein, so long as any of this company's first lien or refunding 5½ per cent gold bonds, series A, remain outstanding and unpaid without the consent of the trustees named in the trust indenture securing said bonds. Action will also be taken to secure legally the retention by the Central Union Trust Company, New York, with which the shares are now on deposit.

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Aggressive Policy Helps New Haven

According to the *Wall Street Journal* a shift in the winds of public sentiment in the past few years, and more particularly the stand of a courageous and aggressive management prevented further sale of outside properties of the New York, New Haven & Hartford Railroad at receivership prices, checked disintegration of the New Haven system and afforded opportunity to work out the problem of its investments. The management is making every effort to develop these properties to best advantage, to salvage and build up values. The same authority says that the comeback of the Boston & Maine Railroad and other properties in which the New Haven Railroad is interested inspires reflection as to what it would have stood to lose had it been forced out of these as it was out of the Rhode Island trolleys, Eastern Steamship and Merchants & Miners Transportation Company, all sold at a heavy sacrifice.

It will be recalled that under pressure from the government through a suit brought under the Sherman anti-trust law the New Haven management of that day, under the famous "consent" decree of 1914, was divested of virtually all extraneous properties. These included the Boston & Maine, controlled through the Boston Railroad Holding Company, the Connecticut Company, operating the Connecticut trolleys; the Rhode Island Company, the Berkshire Street Railway, the Vermont Company, the Westchester Street Railway, the New York & Stamford Railway and the New England Investment & Security Company, which controlled the Springfield Street Railway and the Worcester Consolidated.

In 1925, the dissolution decree was nullified completely by the court, which directed the handing back to the New Haven of the Connecticut Company, the New York & Stamford Railway, the Berkshire Street Railway, the Vermont Company and the New England Investment & Security Company, controlling the Springfield Street Railway companies and the Worcester Consolidated.

The *Wall Street Journal* says:

The Connecticut Company for many years has earned its fixed charges and something over on its $40,000,000 stock, which is owned entirely by the New Haven. Its total investment in this company is above $45,500,000, but the independent appraisal which is being made of the value of the Connecticut Company properties indicates that the valuation will more than support New Haven's investment therein.

While the court order permitted return of the Springfield Street Railway and the Worcester Consolidated, the New Haven also had to get special legislation in Massachusetts and authority from cities and towns served to resume operation of these properties. These were secured, the New Haven stating that it was prepared to expend $1,000,000 on each of the properties for their rehabilitation and development. It has made many improvements, supplementing railway lines with bus lines and adding new equipment.

Thus the New Haven management has gone ahead making the most of its opportunities for service, preserving the integrity of its property and developing its outside investments.

Decline in Traffic in St. Louis in November

The number of passengers carried by the United Railways, St. Louis, Mo., fell off 1,359,276 in November compared with a similar month in 1926, according to statistics compiled by the St. Louis Public Service Company, which succeeded the United Railways on Dec. 1. The figures were 21,098,039 and 22,457,315. An 8-cent base fare with two tokens for 15 cents was granted the company by the Missouri Public Service Commission on the assumption that the new rates would yield the company $119,056 a month more than the old rate of 7 cents straight. Figures for November show that an increase of only $16,729 was realized.

$19,610 for Municipal Railway Equipment at New York

The public auction sale of trackless trolley cars and trolley cars held by the Department of Plant and Structures, New York City, N. Y., on Dec. 5, 1927, and continued on Dec. 28, 1927, resulted in the disposition of the material used by the city in municipal railway operation in five lots.

Lots 1 and 2 were awarded to L. Schiavone and Bonomo Brothers, Jersey City, N. J., the highest bidders, as follows:

Lot 1. Seven Atlas trackless trolley buses, stored at carhouse at Concord, Staten Island, N. Y.	$385
Lot 2. Fifteen Brockway trackless trolley buses. Ten stored at carhouse at Greenridge, S. I., and five stored at carhouse at Concord, Staten Island, N. Y.	825
Total	$1,210
Lot 3. Thirty-eight Birney type trolley cars, stored at carhouse at Concord, Staten Island, N. Y.	$6,000
Lot 4. Fifteen Second Avenue type trolley cars, stored at carhouse at Concord, Staten Island, N. Y.	2,400
Lot 5. Thirty-three Birney type trolley cars, stored at Williamsburg Bridge carhouse, Bedford Avenue, between South Fifth and South Sixth Street, Brooklyn	10,000
Total	$18,400

Decrease in Riding in Decatur

Car lines in Decatur, Ill., operated by the Illinois Power & Light Company, showed a marked decrease in transportation in 1927, despite the small decrease in total mileage. The mileage was 998,638, a decrease of 52,500 miles, and the passengers numbered 5,112,457, a falling off of 456,000. Approximately 20 per cent of the passenger travel was on transfer.

Would Abandon Nine-Mile Line in New Hampshire

The Massachusetts Northeastern Street Railway has petitioned the Public Service Commission of New Hampshire to abandon railway service on certain of its lines in that state. The particular line set forth in the petitions names the railway route between Plaistow and Rowes Corner in Newton, a distance of 9 miles. In its petition for abandonment the company claims it sustained a loss on this line in 1926 of approximately $9,000. Operating expenses were decreased during 1927 by making fewer runs over the line and the loss was not so great.

Binghamton Sale Put Off

Sale of the properties of the Binghamton Railway, Binghamton, N. Y., has been indefinitely postponed. At first the sale under foreclosure proceedings was set for Dec. 1, 1927, and later was deferred to Jan. 5, 1928. The railroad proper consists of 47.72 miles of single and double track.

Report Issued on New York State Operations

The New York State Railways, operating in Rochester, Syracuse, Utica and Uneida, reports a net income of $529,006 for the year ended Dec. 31, 1926, against a net of $760,138 for the year previous. Contained in the report is a comparative statement of the earnings and expenses for 1926 and 1925, which is shown herewith.

SUMMARY OF OPERATIONS OF THE NEW YORK STATE RAILWAYS FOR THE YEARS ENDED DEC. 31

		1926		1925
Railway operating revenues		$10,351,484		$10,027,906
Railway operating expenses (including depreciation)		7,588,755		7,199,139
Net revenue railway operations		$2,762,728		$2,828,766
Net revenue auxiliary operations		495		1,247
Net operating revenue		$2,763,224		$2,830,014
Taxes assignable to railway operations		659,422		695,146
Operating income		$2,103,801		$2,134,868
Non-operating income		*$8,194**		132,942
Grossi ncome		$2,065,607		$2,267,810
Deductions from gross income		1,536,601		1,507,671
Net income		$529,006		$760,138
Sinking fund appropriations		31,603		32,664
Dividends 5 per cent cumulative preferred stock (see note)	(5%)	193,125	(5%)	193,125
Earned on common stock	(1.52%)	$304,278	(2.68%)	$534,349

Note: 2½ per cent paid in 1925, none paid in 1926.
*Adjustment of excess of specified return under service-at-cost contract, city of Rochester.

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Book Reviews

Mundy's Earning Power of Railroads

New York and Chicago: James H. Oliphant & Company, 1927. 568 pages.

The 22d issue of the Floyd W. Mundy compilation is a comprehensive study of stocks, funded debt, mileage, revenues, expenses, maintenance, dividends, valuations and other important factors in the earning power of one of the greatest utilities. In the interest of the investor these statistics are arranged to give the best available information on the value of stocks or bonds of any railroad and to permit easy comparison.

Engineering of Power Plants

By R. H. Fernald and G. A. Orrok. Third edition. New York: McGraw-Hill Book Company, Inc. 663 pages. Price, $5.50.

Twenty-six chapters in this book outline the whole power-station field as it exists today and introduce to readers the equipment available and the present practices in power-station design. All through the book an economic and commercial rather than a theoretical point of view is found. The authors discuss power plants in terms of equipment or of application. While primarily a college text book, there are many engineers who will find it valuable.

Electrical Power Transmission—Principles of Design and Performance

By E. A. Loew, professor electrical engineering University of Washington. New York, N. Y.: McGraw-Hill Book Company. 400 pages. Price, $4.

The first seven chapters are devoted largely to a discussion of the mathematical tools and the underlying circuit theory of the transmission line. The last seven chapters discuss the mechanical features of line design with a study of the economics of line design as influenced by both the mechanical and electrical features.

Transactions of the National Safety Council

Sixteenth Annual Safety Congress, held in Chicago, Sept. 26 to 30, 1927.

Proceedings of the 1927 Safety Congress are published in several parts. The one of most interest to electric railway men, naturally, is the report of the Electric Railway Section, comprising 88 pages. Other sections, of nearly as much interest, are the Public Utilities Section, the General Sessions, and the Transactions of the National Safety Council (Public Safety Division). Those that took part in the Electric Railway Section are prominent in the electric railway field, and the discussions and papers are intensely practical.

The Principles of Bond Investment

By Lawrence Chamberlain and George W. Edwards. New York, N. Y.: Henry Holt & Company. 700 pages. Price, $7.50.

For sixteen years Chamberlain's "The Principles of Bond Investment" was known as "The Bible of Wall Street." It was the precursor of a long list of similar books. Since the original book was written, however, there has been a period epochal in that it has witnessed a world war, a new banking system and a system of taxation that is virtually new.

Moreover, certain industries have in the meantime atrophied, others have been created, old types of securities have disappeared, others have assumed greater importance and new types have sprung into being. In consequence almost all the old matter has been rewritten and a number of new chapters have been added. In the book as it is now rewritten, the intricate subject of taxation has received the attention that it deserves. If the investment trust appears to have been neglected, that is only because this practice applied to the idea of diversification is still too young as a practice in the United States to warrant its inclusion.

So much for the book in general. To be more specific, there is an excellent chapter "Public Utility Securities" also a special chapter "Street Railway Bonds." In both of these public utility operators will be interested, but electric railway men particularly in the authors consideration of street railway bonds. Naturally the attention given to this subject in a work of this kind is not exhaustive, but the conclusions are very much to the point, borne out by many quotations, not a few of which are from the ELECTRIC RAILWAY JOURNAL.

Some of the inherent defects in street railway bonds under the old form of mortgages are pointed out, but the authors say that during the last decade changes in the financial structure of electric railways, as in practically all utilities, have eliminated many undesirable features. They hold to the view that the investor should not turn away because of the many failings of the electric railway class, but rather that he should remember that there are numbers of splendidly equipped and well developed companies with records and capacity for earning beyond question. In conclusion they say that only men of affairs capable of diagnosing reports, and seeking a large return from a form of investment that is fairly convertible, should seek to meet their needs with electric railway bonds. Of incidental interest to electric railway operators is the chapter in which the authors discuss equipment trust obligations.

Despite the growth of investment literature in recent years "The Principles of Bond Investment," with all due respect to other treatises, appears to be in no danger of having its previous place as "The Bible of Wall Street" ursurped by any other aspirant to such honors. It is still the classic volume in its own field.

Die Elektrifizierten Hauptlinien der Schweizerischen Bundesbahnen

By J. Göttler. Berne: Bolliger & Eicher, Price, 2 Swiss francs (40 cents). 56 pages, illustrated.

This is a technical account of the electrical equipment of the Swiss Railways brought up to date. It gives a general review of the work, accounts of the power stations, transmission systems, substations, overhead conducting system and locomotives, with some particulars of the results of operation, cost and financial results.

Employee Magazines in the United States

Prepared and published by the National Industrial Conference Board, Inc., New York, N. Y. 89 pages. Price, $1.50.

Analysis of a large number of employee magazines was made in order to prepare this digest of ways and means of publishing them. Considerable help was received from a number of editors of successful publications of this sort. Their advice and views are printed at some length, as well as the judgments of the compilers.

Deutscher Reichsbahn-Kalender for 1928

Published by the German State Railway Company, Berlin, Germany.

The German State Railway has issued an attractive calendar for 1928 with three leaves per week, or 156 altogether. It is illustrated by views of places reached by the system, with some historical views. Illustrations of electrically equipped lines are included.

Water Power Bonds—1927 Edition

New York: Minsch, Monell & Company, Inc. 90 pages.

Statistical data including descriptions, a table of comparisons and a chart are featured in this sixth edition. Information is collected in regard to water power development, 55 hydro-electric companies and the securities of the latter as investments. The booklet is intended for the investor and layman "who cannot be expected to be acquainted with the technicalities nor the common phraseology of the hydro-electric industry."

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Personal Items

J. B. Potter Made Manager at Wilkes-Barre

J. B. Potter has resigned as manager of the Bridgeport and Norwalk divisions of the Connecticut Company's railway and bus lines, effective on Feb. 1, to become general manager of the Wilkes-Barre Railway, Wilkes Barre, Pa. Mr. Potter will be succeeded at Bridgeport by Frank L. Kibling.

After he was graduated from Cornell University Mr. Potter went with the Westinghouse Electric & Manufacturing Company. Here he learned the rudiments of the electrical industry, and from 1898 until 1900 he was an engineer for Sanderson & Porter, New York. He next entered the railway industry as superintendent of a line operating between Worcester, Mass., and Central Village, Conn.

In 1907 Mr. Potter became manager of the New York & Stamford Railway and the Stamford and Norwalk divisions of the Connecticut Company and remained in these posts for a period of ten years. In 1917 he was appointed manager of utilities for Sanderson & Porter, New York. He resigned this position in July, 1919, to become engineer in charge of economies of the Federal Light & Traction Company, New York. In 1920 he returned to the Connecticut Company as manager of the Bridgeport and Norwalk divisions.

Mr. Kibling, who succeeds to the managership, has been with the Connecticut Company since 1905. He started as a motorman. In 1909 he was appointed starter and subsequently became chief instructing motorman. In 1912 he was made dispatcher and in 1914 became superintendent, the position from which he is promoted to succeed Mr. Potter.

Changes on California Commission

Following the custom heretofore established of rotating the presidency of the commission each year, Ezra W. Decoto retired Jan. 3 as president of the California Railroad Commission and Leon O. Whitsell was elected president for the year 1928.

President Whitsell has been a member of the Railroad Commission since 1925 and was reappointed for a full term of six years by former Gov. Friend W. Richardson on Jan. 1, 1927. He was appointed from Orange county where he was a member of the Board of Supervisors. He was a practicing attorney for many years before engaging in citrus growing in southern California. He resides at Burlingame.

F. O. WHITEMAN, service agent of the East St. Louis & Suburban Railway, East St. Louis, Ill., and its subsidiaries, was recently appointed superintendent of service. This appointment placed him in charge of the transportation department in addition to his duties in the passenger and freight departments. His office was removed from the Eads Bridge station to the main office.

J. C. Guild, Jr., New Chattanooga Manager, Well Known in South

Jo Conn Guild, Jr., whose appointment as general manager of the Tennessee Electric Power Company, Chattanooga, Tenn., to succeed the late B. C. Edgar, was referred to in the ELECTRIC RAILWAY JOURNAL, issue of Jan. 7, is widely known in Nashville, Chattanooga and elsewhere throughout the State. For the past 4½ years he has served the Tennessee Electric Power Company as vice-president.

J. C. Guild, Jr.

The new executive upon leaving Vanderbilt University in 1908 engaged in construction work at the Hales Bar power plant. This project was one of the outstanding engineering achievements of its character in the South. Mr. Guild was identified with the work during the last four years of the project, holding at the completion of the work the position of assistant resident engineer. Immediately thereafter, in 1913, Mr. Guild entered the employ of the Chattanooga & Tennessee River Power Company in Chattanooga in new business development work, with special attention to the sale of electric power to the new and expanding industries in his home city.

In 1915 he was appointed to the post of general manager. Several years later, when the Chattanooga & Tennessee River Power Company was consolidated with the Chattanooga Railway & Light Company and Tennessee Power Company into the Tennessee Electric Power Company, Mr. Guild became vice-president of the combined companies. In the meantime he had become closely identified with the growth and development of Chattanooga's business life.

Mr. Guild, of distinguished ancestry, was born and reared in Chattanooga. He received his early education at the Baylor School in that city, later matriculating at the University of Virginia. After two years he transferred to Vanderbilt University in the engineering course.

His contacts with the public in general early made Mr. Guild, like his predecessor, a firm believed in the policy of maintaining good public relations between the power company and the customers it serves. He frankly advocated the widest possible dissemination of information regarding the affairs, policies and progress of the Tennessee Electric Power Company through the press. As a result, in the fall of 1923, Mr. Guild was designated, in addition to his other duties, to supervise the sale of the company's preferred stock on the customer-ownership plan.

The new executive has been closely associated with the late Mr. Edgar in all of the operating problems and policies of the company and is considered fully qualified by experience, ability and training to take over the reins of one of the largest concerns of its kind in the South.

New Assignments in Fort Worth

A. J. Rowe, assistant manager of the Northern Texas Traction Company, Fort Worth, Tex., has been made assistant superintendent of transportation in a new schedule of personnel changes announced by A. F. Townsend, manager of the company.

A. A. Chamberlain, in addition to his duties as assistant treasurer, has taken on the new duties of general passenger agent and supervisor of advertising.

F. W. Mayborn will be actively engaged in advertising work, though continuing in his capacity as assistant general passenger agent.

C. H. Bowen remains as superintendent of city transportation.

L. H. Church With "Journal" Staff

Leonard H. Church, with the editorial staff of the *Electrical World* for the past year and a half, first in New York and more recently in Cleveland, has been appointed editorial representative of the ELECTRIC RAILWAY JOURNAL in Chicago, with the title of assistant editor. For three years before he assumed editorial duties in New York, Mr. Church was a member of the faculty of the electrical engineering department of the Kansas State Agricultural College, Manhattan, Kan. In addition to his academic work Mr. Church, while he was in the West, served as a consulting engineer on the Red Wing rural project in Minnesota and specialized in rural electrification in Kansas.

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Manufactures *and the* Markets

$529,655 Budget at Houston

The 1928 budget of the Houston Electric Company, Houston, Tex., lists expenditures totaling $529,655. The budget is $125,000 more than the 1927 budget. Important features in the 1928 plan of the company include removing the carhouse at Texas and Brazos and relocating on the old circus grounds on Silver and Sabine, placing $181,000 worth of buses on the Harrisburg line, building a big garage at the Texas and Brazos carhouse, erecting a steel trestle over White Oak Bayou, etc.

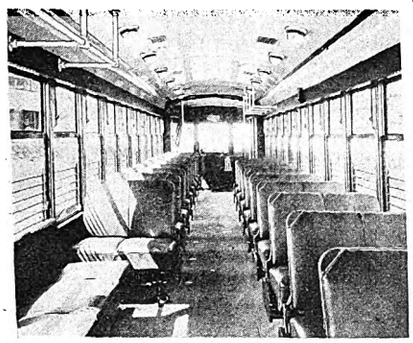
More land has been acquired by the company in the rear of its present carhouse at Texas and Brazos and the garage and machine shop will be built over all the area.

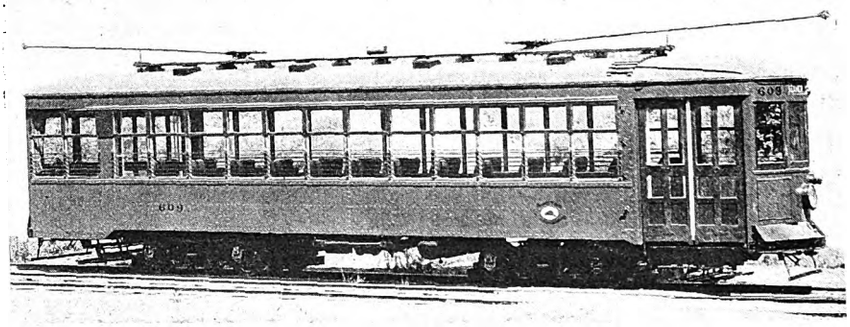
The interurban station and express house will remain on the present location. Contract for paving the gravel portion of Texas Avenue from Louisiana to the bayou and in front of the interurban office has been let.

METAL, COAL AND MATERIAL PRICES
F. O. B. REFINERY

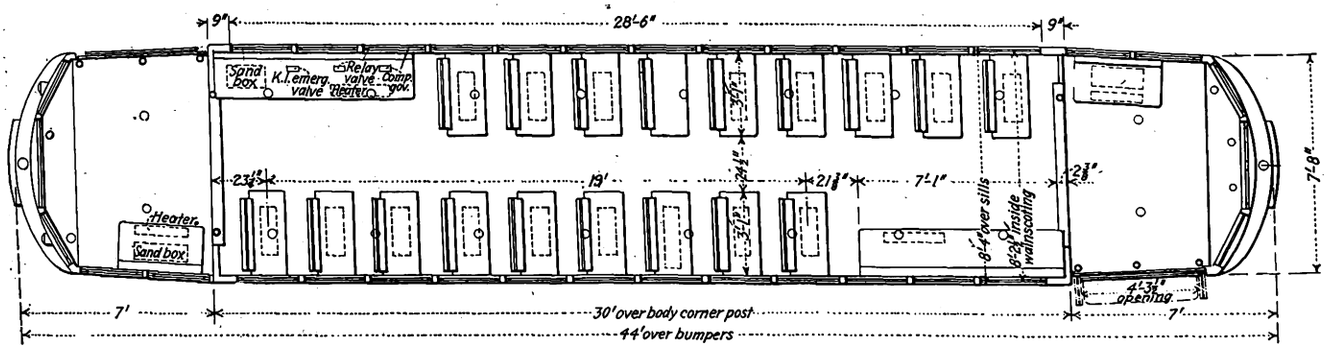
Metals—New York	Jan. 10, 1928
Copper, electrolytic, cents per lb	13.875
Copper wire, cents per lb	15.75–16.00
Lead, cents per lb	6.50
Zinc, cents per lb	6.00
Tin, Straits, cents per lb	56.125
Bituminous Coal, f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	.....
Somerset mine run, Boston, net tons	.....
Pittsburgh mine run, Pittsburgh, net tons	.....
Franklin, Ill., screenings, Chicago, net tons	1.65
Central, Ill., screenings, Chicago, net tons	1.45
Kansas screenings, Kansas City, net tons	2.175
Materials	
Rubber-covered wire, N. Y., No. 14, per 1,000 ft	5.50
Weatherproof wire base, N.Y., cents per lb.	16.75
Cement, Chicago net prices, without bags	2.05
Linseed oil (5-bbl. lots), N. Y., cents per lb.	10.10
White lead in oil (100-lb. keg), N. Y., cents per lb	12.75
Turpentine (bbl. lots), N. Y., per gal	0.675

Eight Attractive Cars for Beaver Valley Traction





Interior and exterior appearance of the eight units delivered last fall to the Beaver Valley Traction Company



The cars are 44 ft. 4 in. over all and seat 50 passengers

Supplementing the preliminary specifications published in the JOURNAL for June 25 are the above illustrations showing the type of one of the eight one-man, two-man double-truck cars ordered by the Beaver Valley Traction Company, New Brighton, Pa., in May, 1927. These units were manufactured by the Osgood-Bradley Car Company, Worcester, Mass., and delivery was made in September. As noted in the JOURNAL of June 25, the order for these units followed the rehabilitation of ten of twenty recently purchased cars which were found not to conform to the standards of ease and refinement set by the company for its patrons. The cars have an overall length of 44 ft. 4 in. Entrance and exit doors will be on the right side only.

The units are of semi-steel construction and are driven by Westinghouse No. 510-E inside hung motors. The exterior color scheme is in orange and the interior trim mahogany. The most modern safety devices have been installed. Revised specifications are as follows:

Name of Railway	Beaver Valley Traction Company, Beaver Falls, Pa.
Number of units	Eight
Type of unit	One-man, two-man, motor, passenger, city, double end, double-truck
Number of seats	50
Builder of car body	Osgood-Bradley Car Company, Worcester, Mass.
Date of order	May, 1927
Date of delivery	Sept. 8 to 15, 1927
Bolster centers	20 ft. 0 in.
Length over all	44 ft. 4 in.
Length over body posts	30 ft. 0 in.
Truck wheelbase	5 ft. 6 in.
Width over all	8 ft. 6 in.
Height, rail to trolley base	11 ft. 1½ in.
Window post spacing	28½ in.
Body	Semi-steel
Roof	Arch
Doors	End
Air brakes	Westinghouse
Armature bearings	Plain
Axles	3½-in. x 6-in. journals
Car signal syst.	Consolidated Car Heating Company
Compressors	Westinghouse DH-16
Conduit	Transite lined cable boxes and Duratube
Control	Westinghouse
Couplers	Metropolitan drawbars
Destination signs	Hunter
Door mechanism	National Pneumatic
Doors	Folding
Fare boxes	Railway company's standard
Finish	Paint
Floor covering	Battleship linoleum
Gears and pinions	Westinghouse
Glass	¼-in. crystal
Hand brakes	Peacock staffless
Heaters	Consolidated Car Heating Company
Headlights	Golden Glow TR-128
Headlining	¼-in. Agasote
Interior trim	Mahogany
Journal bearings	Plain
Journal boxes	Symington
Lamp fixtures	Keystone-Ivanhoe No. 1022
Motors	Westinghouse No. 510-E, inside hung
Painting scheme (color used)	Orange
Registers	Railway company's standard
Roof material	Wood
Safety car devices	Safety Car Devices Company
Sash fixtures	Edwards
Seats	Hale & Kilburn No. 300
Seat spacing	28½-in.
Seating material	Leather, maroon
Slack adjusters	American Brake Company's Form "J"
Steps	Folding
Step treads	Ash
Trolley catchers	Ideal
Trolley base	Nuttall No. 20
Trolley wheels	More-Jones
Trucks	Standard Motor Truck Company's C-35-P-L
Ventilators	Nichols-Lintern Type "C"
Wheels, type	28-in. wrought steel
Wheelguards or fenders	Osgood-Bradley Car Company

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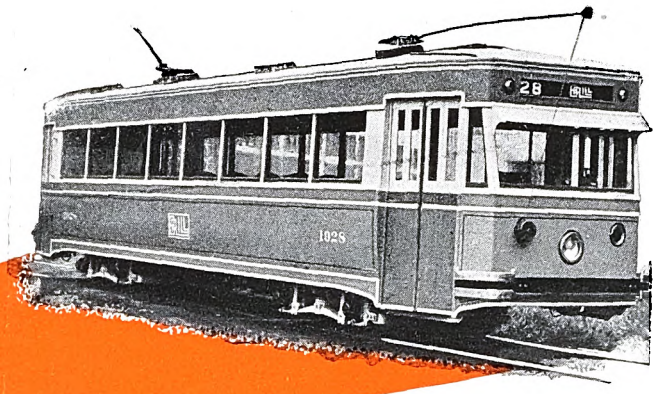


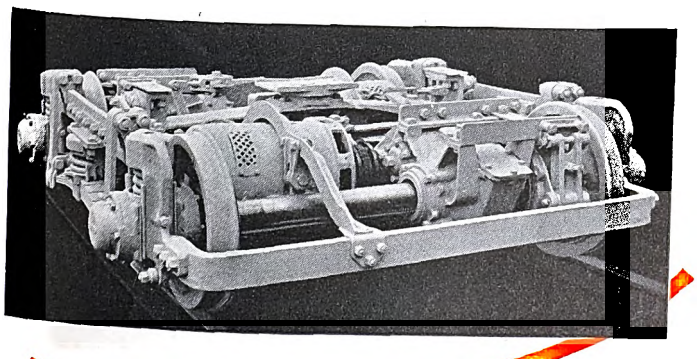
The Car for 1928 Leads the Field

When the story of progress made in electric railway car design during 1927 is transcribed, it will unquestionably set forth the Brill 1928 Model as the outstanding development made for many a year in double-truck electric cars. In appearance, comfort and efficiency it leads them all. Give the public an opportunity during 1928 to demonstrate its appreciation of a type of electric car which attracts riders. More riders mean more revenue, and success.

Brill No. 277-EX Truck

In the first place, those features of conventional truck design which contribute to smooth and comfortable riding are embodied in the Brill 277-EX trucks under the "Car for 1928." Solid-forged sideframe, bolster guide, graduated spring system and twin links are among the popular Brill truck features included.

Mounting the motors on the truck frame, instead of the axles, and the use of W-N double-reduction gear units operating in oil are among the innovations introduced for the reduction of noise.



The J. G. Brill Company
Philadelphia

American Car Company
St. Louis

The G. C. Kuhlman Car Co.
Cleveland

Wason Mfg. Company
Springfield, Mass.

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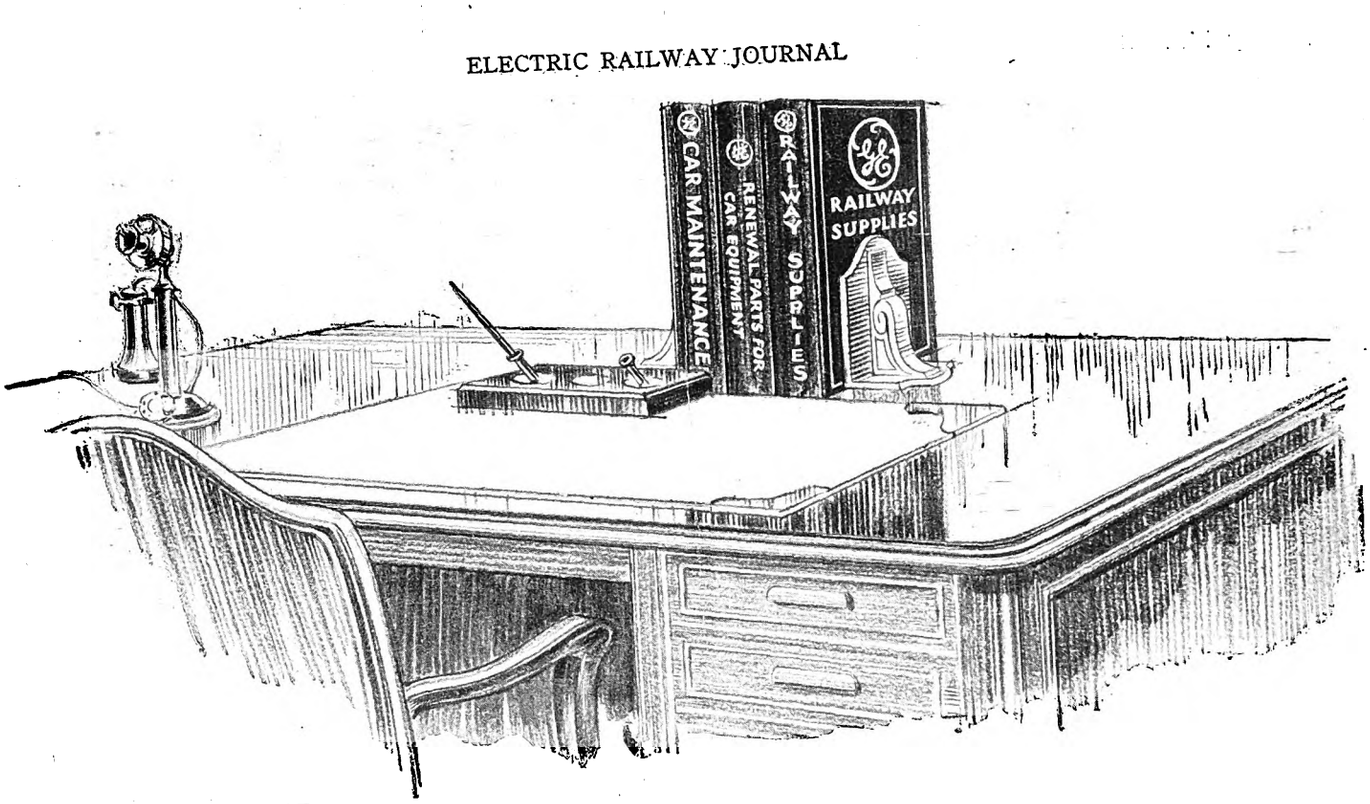

Modernize - *refer to these three books*

"Modernize", the operating slogan of today, has at least three applications: Modernize equipment, maintenance, and methods. To help attain these objects, modernize your railway library.

General Electric has compiled three books of highest practical value in *modern* railway operation.

FIRST: Complete Catalog of Railway Supplies. This is an index of modern standards. Use it as a helpful guide to the selection of supplies and equipment.

SECOND: Renewal Parts Catalog compiled individually for each railway company. It lists, describes, and offers duplicates of every equipment part. Use it to assure original equipment quality in maintenance.

THIRD: Maintenance Data Book. This is a compilation of practical experience. Use its suggestions as to the most economical and efficient ways of maintaining equipment and of making repairs or replacements.

Have you this three-book shelf at hand? If so, do you keep it to date by inserting each addition that General Electric sends you?

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GENERAL ELECTRIC

GENERAL ELECTRIC COMPANY, SCHENECTADY, N. Y., SALES OFFICES IN PRINCIPAL CITIES

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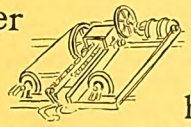
MAINTENANCE AND CONSTRUCTION ISSUE

ELECTRIC RAILWAY JOURNAL

McGraw-Hill Publishing Company, Inc. JANUARY 21, 1928 Twenty Cents per Copy

1928 PAVED TRACK PROGRAMS WILL BE ON A PRODUCTION BASIS

WITH pick and shovel the first paved track was laid. Wood Ties and light rails were used. That construction soon went to pieces. Then came more modern methods. Concrete came in—and was mixed first by hand—then by machinery. Then came air breakers to destroy the old, to aid the pick, to make way for the new. Steel Twin Ties were gaining in favor.

TODAY track laying machinery in the form of a tie layer and a compression tamper  enable paved track to be laid on a production basis. Tony with his pick and shovel has gone —Steel Twin Ties with modern machinery have arrived—making a paved track that is cheaper, better, more lasting than ever before.

THE INTERNATIONAL STEEL TIE CO.
Cleveland, Ohio

STEEL TWIN TIE TRACK
THE BASE OF MODERNIZATION

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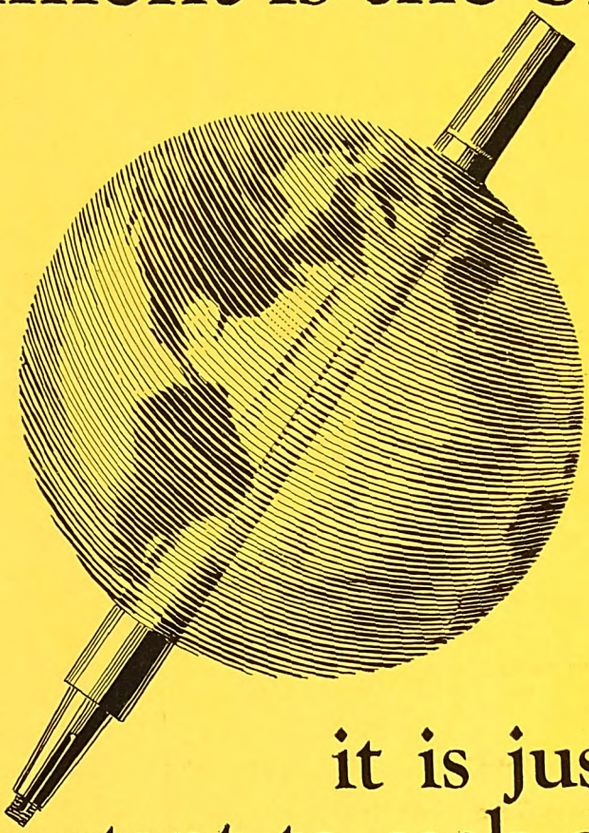
Public Sentiment is the Shaft

about which the Traction World rotates



it is just as important to seek good *Armature Shafts* as the "good will" of the Public.

MODERN railway service is making greater demands on equipment as time goes on and much of this increased burden must be borne by motor shafts.

To meet these new conditions, Westinghouse, at its Homewood renewal parts plant, has developed a line of heat treated and alloy steel replacement shafts that will stand up under the most severe demands of modern service.

Compare the strength of Westinghouse special steel replacement shafts and common axle steel shafts in the following table:

	Ultimate Tensile Strength Lb. per Sq. In.		Yield Point Lb. per Sq. In.	
	Guaranteed	Average	Guaranteed	Average
Alloy Steel	100,000	117,000	65,000	80,000
Axle Steel, Heat-Treated	80,000	105,000	50,000	65,000
Axle Steel	75,000	85,000	40,000	45,000

For better shaft replacements, call on Westinghouse.

Westinghouse Electric & Manufacturing Company
East Pittsburgh Pennsylvania

Sales Offices in All Principal Cities of the United States and Foreign Countries

Westinghouse Renewal Parts Reduce Maintenance Costs

MEMBER AMERICAN ELECTRIC RAILWAY ENGINEERING ASSOCIATION AERA 1928

Westinghouse

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Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review
Published by McGraw-Hill Publishing Company, Inc.
CHARLES GORDON, *Editor*

Volume 71 New York, Saturday, January 21, 1928 *Number 3*

Slaying the Four Dragons of Maintenance

SYMBOLIC of the power of evil or of evil itself was the dragon in ancient mythology. Legends were built around heroes who were reputed to have met and slain the dragons. Is it too great a strain on the imagination to picture the modern equipment executive as a Siegmund and the destructive forces as the dragons which he must set out to slay? For that is just what he must do—attack the destructive agencies which beset his rolling stock.

Four dragons lying athwart his path are wear, corrosion, vibration and dirt. Ill appearance and discomfort are allied demons, but with the other four out of the way, it is easy to turn attention to them. The other maintenance demons will succumb only to analysis and deep study.

Look briefly over the four maintenance dragons. Wear is probably uppermost in everyone's mind. Little that can be proposed is new. There is one development to which attention is called, the plating of wearing surfaces with chromium. Quite possibly this process holds possibilities of effecting marked economies.

Corrosion comes next. Steel construction in car building has become practically standard. The underside of a car is subject to the corrosive effects of water spray loaded with salt, alkalies and sometimes acids. Then there always is a coating of dust to retain these destructive agents. Steel sheathing, tee posts and pipes have often been known to corrode to the point of destruction within seven years. Rust-repellent steel has been developed to the point that it is available and its use is advisable. Steel with a copper content of 0.18 per cent shows markedly less corrosion than ordinary steels. Interesting tests on this subject are reported in Vol. 22 and Vol. 23 of the A.S.T.M. *Proceedings*. From them the economy to be obtained by the use of such steel can be determined.

Next comes vibration. It is a dragon of such ferocity that it tests the mettle of any engineer. In fact, it has so many elements of destructiveness that it will be made the subject of a separate editorial. Sufficient here to say that it can be met and overcome.

The fourth dragon is dirt. In the pathway of the equipment man dirt serves but one useful purpose, to show him the loose parts. For this purpose it is of great value. But dirt—meaning grit—is the greatest enemy of wearing parts. If bearings, guides, clevises and similar wearing parts could be protected absolutely against dirt their life would be prolonged greatly. Fenders over car wheels have been used to great advantage to keep dirt from moving parts. Alemite or similar lubricating systems have been used successfully for brake hanger pins and the like so as to form a grease seal to prevent the entry of grit. As the grease is forced from the inside to the outside clean grease is always present to protect the bearing surfaces and the new grease tends to force out any particles of grit that may have worked in.

So it is not too much to believe that these four dragons can be slain or driven back to their lair. If they are overcome the equipment man will have reached a point far nearer to ultimate perfection and will have obtained not only increased economy but a greater ride sales value for his equipment.

Vibration a Destructive Agency

VIBRATION as a destructive agent is not fully appreciated. This is evident because so little has been done to combat it. It becomes manifest in cracked or broken axles, fatigue and fracture of many other parts throughout the car and track structure, and in noise. If of low frequency it may directly produce discomfort to the car rider. The great trouble with failures due to fatigue of metal, the direct result of continued vibration, is that breakdown does not occur until after the lapse of considerable time. The vibration is all too often looked at as a matter of course and steps are not taken to minimize the evil.

The remedies for vibration, so far as it applies to the maintenance of cars, may be summarized as reduction of gross weight, reduction of unsprung weight, greater care in selection and treatment of steel and other structural materials, more careful construction and cushioning. The factors of weight determine the amplitude of the vibration wave. It is obvious that the lower this amplitude the less will be the destructive action and the greater the life of the structural part.

As to quality of material, first cost is too often allowed to overshadow the value of long life. The question of metallurgy must be given deep thought if the maximum economic value is to be obtained. Often a change to a steel much better adapted to the purpose can be made at little or no additional cost. Likewise more careful engineering in the proportioning of parts is of value. In other words, in ordinary design too much is left to guesswork and rule of thumb methods.

From a construction standpoint, there is much need for closer fits. If wearing parts such as bearings and clevises are well fitted there is little tendency for them to set up vibration with consequent wear, fatigue of metal and noise. For example, a loose fit of an axle bearing not only allows grit to enter, but it permits the bearing to vibrate and add hammering to the normal frictional wear. The vibration within the bearing tends to crystallize it and cause fracture. The vibration is transferred to the armature leads, causing breakage there, and also to the gear case, to bolts and to dozens of other

This is the issue in January that is devoted essentially to maintenance and construction subjects

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parts, each in turn suffering for the sin of the loose bearing.

Another constructional feature having to do with vibration is the item of fillets. While fillets cannot stop vibration they certainly minimize its effects by distributing stresses and preventing localized bending. Fillets should be of the largest practicable radius and should be true segments of circles, ending in tangents.

All parts should be machined carefully and fitted tightly. A construction cannot be kept tight if an unfinished casting is bolted or riveted directly to a rolled section, because the contact between the two consists of several points instead of a flat surface. Subsequent vibration is sure to imbed these points into the opposing surface with resultant loosening and added wear, vibration and noise. The only practical way of making a permanently tight joint between unfinished parts is to interpose a layer of soft material such as canvas dipped in linseed oil paint. If the compressive strains are too great for such treatment the sole alternative is careful machining of the parts coming in contact. Another aid to the maintenance of tight fits is use of the new American Standard fine threads. Bolts can be made of better steel and finished under the heads where practicable.

The final element in reduction of vibration is the use of springs and cushions. To be effective springs must absorb much of the vibration. Today much attention is being paid to rubber as a supplement to spring action. It has been used between the halves of elliptic springs, on the end supports of semi-elliptic springs, in center bearings, in quarter bearings and even in wheels. Much of this is in the experimental stage, but it gives promise of real results in the near future. If rubber can be used successfully in wheel construction it will go a long way toward reducing the effective unsprung weight of the car.

In the final analysis vibration means fatigue and rapid ageing of parts, accelerated wear and noise. And noise in turn is the sure signal that something is wrong.

Where the Maintenance Money Goes

QUESTIONS are often asked as to the division of expenditures in the various maintenance departments between materials and labor. While it has been possible to make the segregation for any one company, it never has been done for the industry with any degree of exactness. In the estimate of expenditures for the coming year, published last week, it was possible for the first time to make an accurate division between maintenance materials and maintenance labor. The results are quite decisive as indicating trends and conditions in various railway departments.

The total expenditures on maintenance accounts are divided in the proportion of three-sevenths materials and four-sevenths labor. The underlying reason for this high proportion of labor is, of course, due to track construction, in which the greater portion of the materials, such as sand, rock and paving materials, bulk large. The work of preparing and placing these materials naturally is a major part of the total cost of the work.

In car maintenance the proportion of material is also low, being some 45 per cent. Contrasted with this, the materials for bus maintenance constitute almost 59 per cent of the total. While in general the processes of repair on cars and buses are similar, here is an indication that bus parts are in large measure finely machined specialties using high-grade materials, while cars include many more foundry and forge shop products of lower grade materials and much rougher finishes.

Obviously there is a field for better car design. While the production of cars is mainly in small orders, there is room for standardization and refinement of parts so that there is less bulk and weight to give needed strength. It may be, of course, that another reason for the higher proportion of labor in car maintenance is due to the manufacture of repair parts in the railway shop, a practice which this paper has always advised against and which is frequently very deceiving in the matter of costs. In any event, the figures indicate that there is a need for further investigation to find if the costs of car maintenance cannot be further reduced by the purchase of more finished parts and the use of less labor, as contrasted with the practice of home manufacture and patching.

Recommendations Growing Out of the I. C. C. Bus Inquiry

INTEREST will run high among all carriers in the reports and recommendations of Attorney-Examiner Flynn of the Interstate Commerce Commission on the subject of the bus and truck engaged in interstate commerce. The findings and conclusions set out in the report are merely tentative. At the hearings more than 5,000 pages of testimony were taken from more than 400 witnesses. This fact is cited merely to indicate the mass of material which had to be considered and to convey an idea of the task before the attorney-examiner in formulating his conclusions.

With these conclusions, in general, there is no cause for quarrel, however much a specific recommendation here and there may be subject to differences of opinion. The conclusions, published elsewhere in this issue, should be read carefully even by those to whom it would now seem they do not apply and by those to whom it would seem they are never likely to apply. It is a changing world and the subject of the motor carrier is by far so big that no one engaged in transportation can afford not to be well informed about the matter and its possible ramifications.

One of the suggestions made is that regulatory intervention by the government is necessary. It is proposed that state regulatory commissions take joint jurisdiction and that joint boards representing two or more states should act when operations extend across one or more state lines, but if the commissions failed to accept authority the Interstate Commerce Commission should act with original jurisdiction. On the decision of such boards, right of appeal to the Interstate Commerce Commission would be allowed. The regulation would apply equally to independent operators and to railroads or public utility companies, and operations would not be allowed until the board had found them necessary in the public interest. Operations begun before March 2, 1925, would be considered as established. If any state refused to apply the regulation, the Interstate Commerce Commission would act for its territory in fixing rates and charges and over the supervision of operation.

Not the least interesting part of the report is the review of the effect of changing conditions on the common carrier. It is significant that during the period since 1921, the number of electric railways reporting to the Interstate Commerce Commission decreased from 312

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to 259 in 1926. During the same interval the operating revenue of the electric railways reporting to the commission decreased from $235,656,072 to $194,860,470, or 17.31 per cent, and electric railway operating expenses of these properties decreased from $189,450,749 to $163,210,222, or 13.85 per cent. The passenger revenue decreased from $193,166,389 to $140,536,857, or 27.25 per cent. As Mr. Flynn points out, however, there was a steady increase in freight revenue during the same period. Returns from this source were $28,585,712 in 1921, and $39,794,714 in 1926, an increase of 39.21 per cent.

As indicated in an editorial in the JOURNAL for Dec. 31, 1927, the matter of the regulation of interstate buses is again before Congress. At that time, some of the reasons for regulation were reviewed. The concern now is with the contents of the report of Mr. Flynn, and with his thirty recommendations. As he indicated, and as ELECTRIC RAILWAY JOURNAL said, public policy demands the fostering and preserving of motor vehicle transportation in its full vigor, but the same public policy requires that there shall be regulation, with a wise, far-sighted and definite co-ordination of all existing transportation agencies—land, water and air.

Better Adjustment for Brush-Holders Will Reduce Motor Trouble

MANY of the troubles experienced in railway motor operation can be traced directly to improper brush-holder action. The defects at the root of the trouble when located appear quite insignificant, but when remedied, a marked improvement in the operation of the motor results.

A surprising fact brought out in the brush-holder survey, results of which are given in this issue, is the large number of types of brush-holders, many of which are unsatisfactory and should be eliminated. Railways with several kinds in service should try to standardize so as to reduce the number on a single property to a minimum. Manufacturers have developed new brush-holders for some of the old type motors in which many of the modern improvements have been incorporated. Use of these improved designs will help minimize brush-holder troubles and insure prompt delivery of renewal parts.

Railway motor maintenance costs are reduced by keeping brush-holders in good condition. Careful attention to some of the points brought out in the brush-holder survey will lengthen the life of brush-holders, carbons and commutators, improve commutation and reduce the tendency to flash between brush-holders and ground. The importance of proper spring pressures has been discussed in these columns at frequent intervals. The survey shows that in general a spring pressure of about 5 lb. per square inch of contact area is good practice. If the brushes spark badly and there is a tendency to flash at high speeds, the spring tension can be raised to between 7 and 9 lb.

Breakage of springs and loss of tension in springs were among the most frequent troubles reported. By keeping braided shunts in good condition, excessive motor current does not go through the spring mechanism and some of the troubles are avoided. When carbon dust or dirt gets into the working parts of a brush-holder, it is sure to work stiffly. Cleanliness and occasional lubrication will do much to insure satisfactory operation.

Spacing of brush-holders and alignment parallel to the commutator bars should be checked at each inspection. In most types of railway motors brush-holders are aligned with the center line of the pole faces. The distance from the center line of one brush-holder to the center line of the next should be equal to one-quarter of the distance around the face of the commutator. The report from one railway stated that flashing with one type of its motors became so serious that cars could hardly be kept in service for any extended period. Investigation showed that the supporting faces had become so worn that when the brush-holders were installed they were not located correctly in relation to the field coils. Each motor was overhauled and the brush-holders were reinstalled with jigs and fixtures so as to make certain that they were located properly. This remedied the trouble.

The distance of brush-holders from the commutator surface affects the wear of the brushes. In general the under side of the carbon box should be between $\frac{1}{8}$ in. and $\frac{3}{16}$ in. from the face of the commutator. This is important, as it reduces the chattering and the tendency of carbons to break.

When mounting brush-holders in the motor frame, the pads or seats should be cleaned carefully and all dirt removed in order to insure proper spacing and alignment. In making connections from the wiring around the frame to the brush-holders, the cable leads should have sleeves or terminals, depending on the design of brush-holder. Use of proper connectors is important to keep the connections tight and secure good electrical as well as mechanical contact. Set screws, if used, should be equipped with lock washers and nuts to prevent loosening. When porcelains are used, they should be kept clean and free from dust and dirt so as to provide the necessary creepage distance to ground, otherwise flashing will occur and the burning action will lead to other troubles.

Manufacturers View New Year Favorably

REPORTS on the extent of business done by manufacturers during 1927 differ. Some of those in the local transportation field whose opinions were quoted in the last issue of this paper found sales somewhat slow. They found that the exchange of obsolete for modern equipment anticipated at the beginning of last year was not up to expectations. According to one prominent manufacturer, in some instances local conditions such as pending franchise changes, paving regulations, etc., beyond the control of the railways, undoubtedly accounted for this delay. Others found the year that has just passed satisfactory from a business point of view and several report an increase in sales over 1926 or previous years.

It is notable that the majority of the manufacturers look forward to 1928 with confidence and optimism. Some of them even believe that it will be a record year in the purchase of the kind of equipment they make. A composite expression of their opinions might read that public authorities are realizing more than ever before the need for good transportation and the railway companies themselves know that this can best be given with modern equipment. Hence they believe these coming twelve months will witness a long step in advance in the adoption and use of up-to-date apparatus.

In the main a crystallization of these opinions indicates that the industry's manufacturers may be expected to share in the continued prosperity of the country for 1928 forecast by leaders in other industries.

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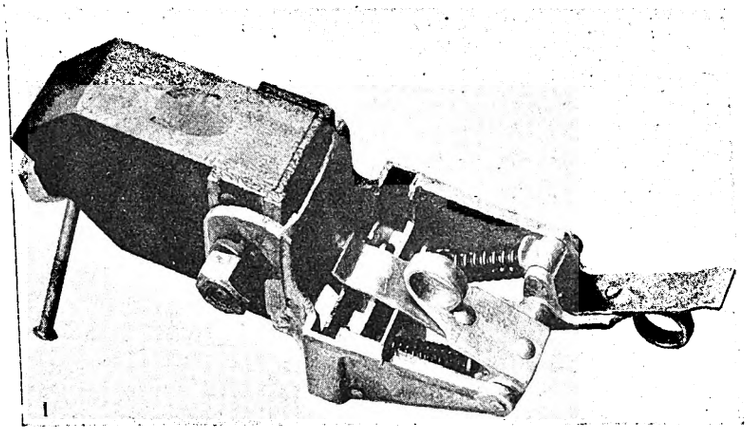
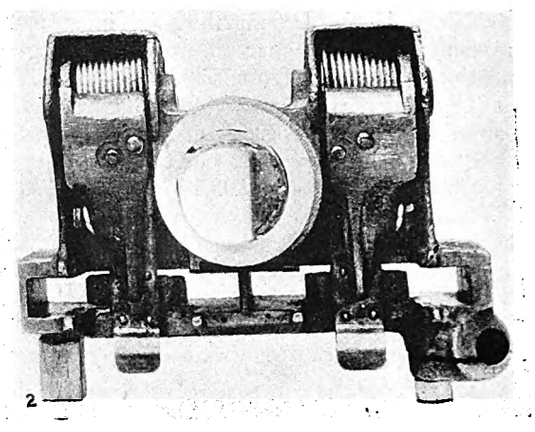




Various Types of
Brush-Holder Mechanisms
Used with Railway Motors

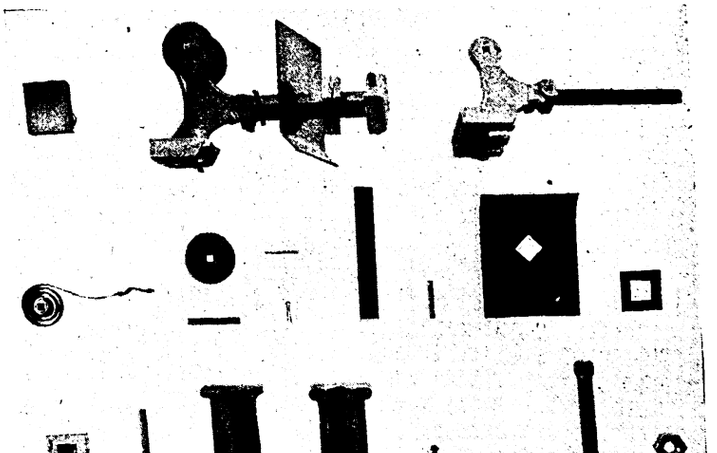
Fig. 1—Non-adjustable type Lorain No. 34 motor brush-holder, in which a round steel wire helical spring gives a definite pressure.

Fig. 2—Non-adjustable type of helical spring pressure mechanism for G. E. No. 66 railway motor brush-holder.

Fig. 5—A square spindle-type brush-holder with a adjustment in the Westinghouse No. 12-A motor brush-holder.

Fig. 4—Semi-adjustable Lindall "Z" spring type pressure mechanism used with Westinghouse No. 306 railway motor brush-holder.

Fig. 5—A square spindle-type brush-holder with a flat bronze spiral spring is used on the Westinghouse No. 93 motor.



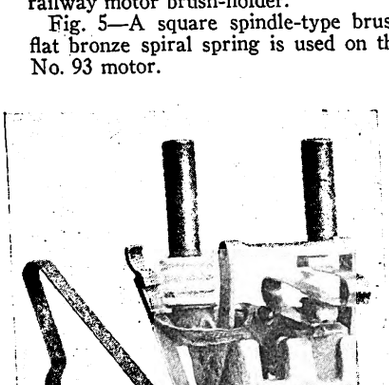
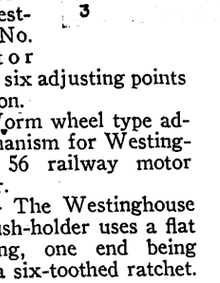
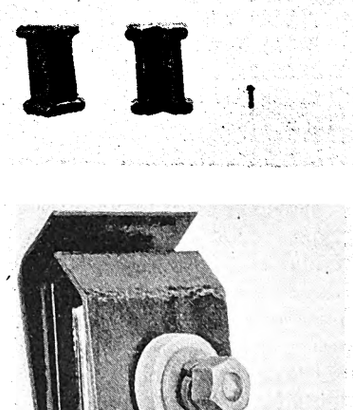


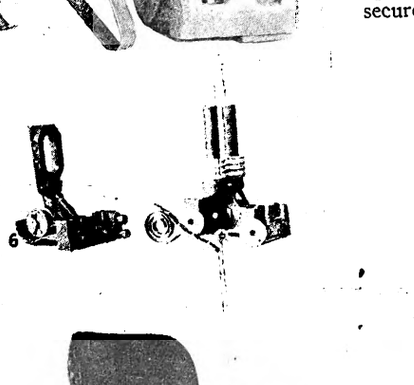
Fig. 6—A hexagonal spindle gives the Westinghouse No. 101-B motor brush-holder six adjusting points in a revolution.

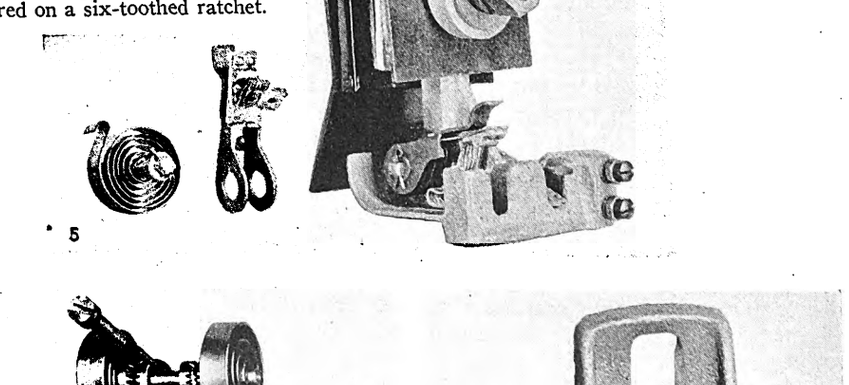
Fig. 7—Worm wheel type adjusting mechanism for Westinghouse No. 56 railway motor brush-holder.

Fig. 8 — The Westinghouse No. 322 brush-holder uses a flat spiral spring, one end being secured on a six-toothed ratchet.









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Brush-Holder Troubles

And How They Are Overcome

Common practices in brush-holder and carbon brush maintenance are determined from a survey covering 30 properties. Replaceable carbon brush boxes prove economical. Side wear of brushes greater with ventilated motors

MANY factors enter into the efficient maintenance of brush-holders for railway motors. The copper shunts break or burn off, insulators crack or become short circuited, flashing and grounding are most common. Many troubles are caused by conditions apart from the brush-holders themselves, such as the type and quality of carbon brushes used, amount of spring tension, or condition of commutator. To determine some of the problems that come up in connection with brush-holder maintenance and to find out how they are being solved most effectively, a survey of this particular phase of maintenance on 30 electric railway properties was made by this paper.

The results obtained by different practices or methods used to overcome some of the troubles are enlightening. The large variety of brush-holders in service is astounding. One property operating 137 cars has 23 different types of brush-holders in use, an average of but one type for every six cars operated. On this particular property none of the different brush-holder types can be used in more than one type of motor. Numerous other properties have many types of brush-holders in comparison with the cars operated. One railway with 49 cars had six different types; another operating 103 cars had eight. Others were one company with 166 cars had thirteen types, a second with 227 cars had seven different types, another with 664 cars had nineteen different types. Still another with 407 cars had twelve different types and another with 403 cars had eleven different types. Out of a total of 26 replies in which definite information was given, the number of car equipments per brush-holder varied from 6 to 344. Under the best conditions, one property operating 3,441 cars had ten different types of brush-holders, a second with 2,000 cars had six different types and a third with 2,858 cars had nine different types. The minimum number of types found was on three properties operating 209, 149 and 91 cars respectively. Each has but two different kinds of brush-holders. The average for the 26 railways from which the information was obtained showed 92 cars per brush-holder type. Of these railways seventeen stated that none of the types could be used in more than one type of motor and nine have types which can be used in two different types of motors. Thus it appears that here is a wide field for standardization.

Of the large variety of brush-holder troubles, those mentioned most frequently are broken springs, worn carbon boxes, broken shunts, flashing and weak springs. Other troubles include grounded, short-circuited, loose and broken insulators, loose shunts, burned and loose springs, broken pressure arms, broken fronts, worn contact tips and dirt back of tension springs.

Rigid Inspection Essential

Many of the methods cited for overcoming brush-holder troubles can be classed under the general heading of rigid inspection and maintenance. Some of the methods given in replies to a question as to how brush-holder troubles are reduced are as follows: Keeping insulators clean; baking and cementing the insulators in place; careful attention to keeping commutators properly slotted; keeping brush-holders, commutators and fields in good condition; use of a clock-spring type of brush-holder; replacing and adjusting springs at frequent intervals; use of a combination of spring and finger type of brush-holder; improvement in the type of shunt and

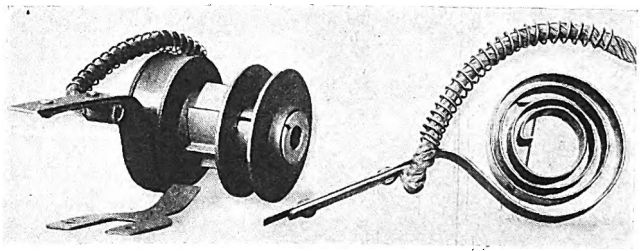

Fig. 9—Six-tooth single center-ratchet type adjusting mechanism for Westinghouse No. 306 railway motor brush-holder

connectors used; giving more attention to the removal of worn brushes; use of a new flat coil-type of spring instead of old-style wire springs; shaping the carbon box on a steel mandrel; checking carbon boxes with a limit gage; cutting out the bottom of brush-holders so as to let out dirt; use of renewable carbon ways; replacing armature bearings; frequent checking of brush-holder spacing; keeping brush movement to a minimum; repairing bad track; insulating motor cases; reducing the voltage on old-type motors; testing fields at frequent intervals for short circuits, and stopping the practice of operating down grade with power on.

Many of these practices are common and are included in the general inspection and overhauling of brush-holders of different railways. However, it is evident that more careful attention should be given to these troubles and inspectors should be instructed in the various points to be taken care of to make certain that brush-holder troubles will not occur. Satisfactory operation cannot be expected where the carbon brushes themselves are loose in the brush-holders due to worn conditions or where

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pressure on the brushes cannot be maintained uniform because the springs need repairs. Careful attention to this particular part of the equipment will bring gratifying results.

Spring Tension Should Not Be Adjusted by Carhouse Men

Railway maintenance men at present seem to be agreed that it is advisable to provide modern brush-holders with some means of adjusting the spring tension. Further, they seem to agree that it is not objectionable—in fact, it is preferable—to remove the brush-holder from the motor in order to make this adjustment. Brush-holders so designed cannot be adjusted readily by carhouse men so that they will not tamper with the spring tension. Adjustments are then made in the shop by trained workmen with proper tools and the most satisfactory operating spring tension maintained. The adjustment is made under the supervision of some responsible head in the shop.

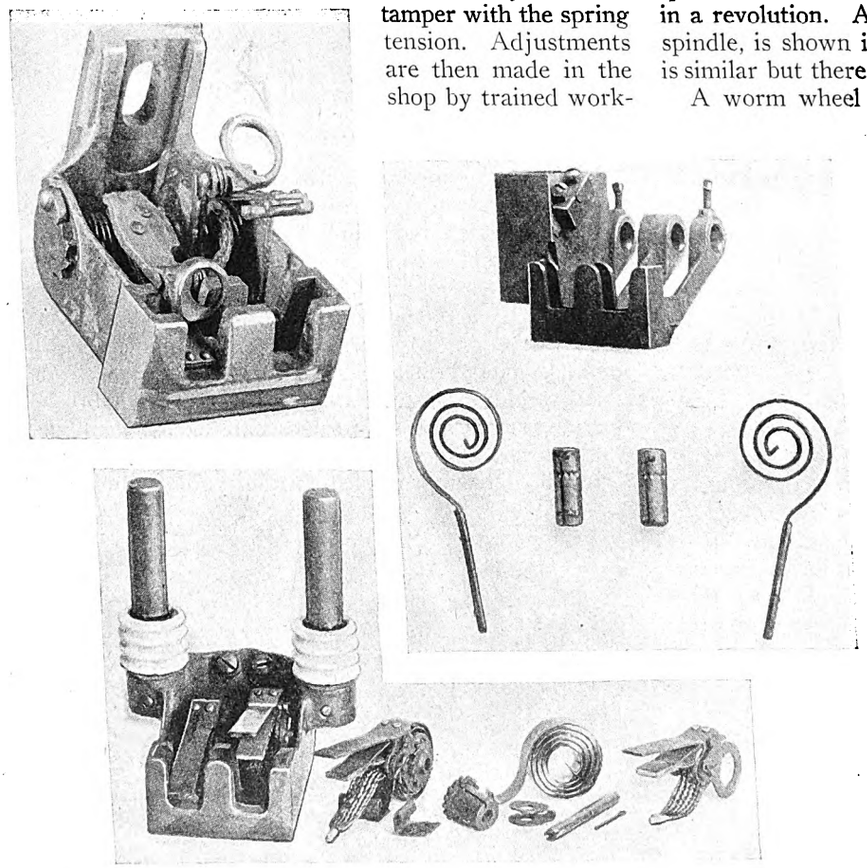

Fig. 10 (Top, left)—The brush-holder of the G.E. No. 21 motor has a ten-tooth ratchet wheel for adjustment.

Fig. 11 (Bottom view)—Fifteen-tooth ratchet-wheel type adjusting mechanism for Westinghouse No. 306 railway motor brush-holder

Fig. 12 (Top, right)—Barrel and set screw ("Flower") type of brush-holder with ten adjusting notches.

Some of the earlier types of brush-holders, many of which are still in use, have tension springs designed for a fixed pressure without adjustment. Later designs include some means of changing the spring pressure on the pressure finger by winding or unwinding the coiled spring and locking it in position.

Accompanying illustrations show some of the various types of brush-holders. Figs. 1 and 2 are of a non-adjustable type, in which a round steel wire helical spring gives a definite pressure. To change the pressure a new spring with a different number of turns or a different size of wire must be used.

In the brush-holder illustrated in Fig. 3 a flat bronze spiral spring gives a partial adjustment. To change this within small limits, the spiral spring may be opened or closed by straining its turns while in position. This will, respectively, increase or decrease the pressure by a limited amount. The Lindall type of brush-holder, shown in Fig. 4, also comes under this class. This uses a Z-shaped flat bronze spring.

A square spindle-type brush-holder is shown in Fig. 5. In this a flat bronze spiral spring is anchored at one end on a square spindle forced into the brush-holder casting. The other end is hooked over an arm on the brush-holder harness or finger. To change this adjustment the spring with the harness is slipped off the square spindle and turned a quarter of a revolution and then replaced on the spindle. This arrangement gives four adjusting points in a revolution. A similar type, but having a hexagonal spindle, is shown in Fig. 6. The method of adjustment is similar but there are six adjusting points in a revolution.

A worm wheel type in which the adjustment means consists essentially of a flat bronze spiral spring anchored on a sleeve on which is cut a spiral thread to engage a worm cut on the adjusting rod, is shown in Fig. 7. This adjustment is made by turning the adjusting rod with a screwdriver, giving an infinite number of steps for the spring tension. A ratchet wheel type with six teeth is shown in Fig. 8. This has a flat bronze spiral spring, one end being secured on a six-toothed ratchet wheel. The ratchet and spring are assembled in a metal harness or finger on which is fastened a pawl or dog which engages the teeth of the ratchet. The other end of the spring is held in an anchor clip riveted to the brush-holder casting. Adjustments are made by shifting the ratchet from one tooth to another. This arrangement gives six adjusting points in a revolution. Fig. 9 shows a somewhat similar scheme of adjustment except that steel spiral springs are used and both springs are anchored to a brass sleeve which has a single set of six teeth on the ratchet located at its center. This makes a common adjustment for both springs and gives six adjusting points in a revolution.

A ratchet wheel type adjustment with ten teeth is shown in Fig. 10. This uses a somewhat similar scheme of adjusting as that in Fig. 6 except that the design of the spring is different. It is a round steel wire helix and the method of anchoring is also different. This arrangement gives ten adjusting points in a revolution. A ratchet wheel type with fifteen teeth is shown in Fig. 11. This is similar to the six-tooth ratchet wheel type and is adjusted the same way except that to compensate for the use of a flat steel spiral spring with fewer turns, a fifteen-tooth ratchet wheel is used. There are fifteen adjusting points in a revolution.

A type of brush-holder with a flat bronze spiral spring anchored on a sleeve or barrel is shown in Fig. 12. This has ten adjusting notches equally spaced in the same plane around its circumference. These notches are engaged by points of set screws, located in the brush-holder casting. Ten adjustments in a revolution are made by turning the spindle from one notch to the other. A

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spindle and cotter pin type of brush-holder, shown in Fig. 13, has a flat steel spiral spring which is anchored in a slot on the spindle. The spindle has four adjusting holes spaced 90 deg. apart in the same plane around its circumference. A boss on the casting has three holes spaced 60 deg. apart through which a cotter pin engages the holes in the spindle. This arrangement gives twelve adjusting points in a revolution by shifting the cotter pin and at the same time engaging a different hole in the spindle. Fig. 14 shows a similar arrangement with two sets of adjusting holes in the spindle, staggered 45 deg., and two sets of holes in the brush-holder casting. This combination gives 24 adjusting points in a revolution by shifting the cotter pin.

Barrel and cotter-pin types of brush-holders are shown in Figs. 15 and 16. In these a flat steel spiral spring is anchored in a slot on the barrel which has ten adjusting holes equally spaced in the same plane around its circumference. This barrel is anchored to the spindle by means of a cotter pin. The spindle is kept from turning by means of the cotter pin anchoring it to the brush-holder casting. This arrangement gives ten adjusting points in a revolution.

A pneumatic type of brush-holder is being developed in which there are no springs, the pressure being supplied by compressed air. An air-operated plunger resting on top of the carbon replaces the ordinary spring. An infinite number of variations of pressure on the brush-holder are possible, being regulated by the air pressure.

Brushes Should Fit Snugly

It is generally conceded that to prevent breakage of their side walls, carbon brushes should fit the box as snugly as possible without binding. To check this, information was obtained as to methods in use for determining wear inside the brush-holder boxes and for making repairs to worn surfaces. It is universal practice to check the wear on the insides of the carbon boxes. Information was received from 25 railways regarding this, 24 stating that they do check the wear and one stating it does not. Regarding the amount of wear permitted before brush-holders are removed, seven reported a maximum wear of $\frac{1}{32}$ in., seven others allowed $\frac{1}{16}$ in. wear before replacement and two allowed $\frac{1}{8}$ in. wear. Of the others the minimum amount allowed was 0.01 in. and the maximum $\frac{1}{4}$ in. Manufacturers recommend that the maximum wear should not exceed $\frac{1}{32}$ in. In regard to repairs made to worn carbon boxes, fourteen railways make repairs and eleven stated that no repairs are made. Of those that made repairs, six used the method of closing the carbon box onto a steel sizer; six others fill in worn portions by welding and then broach or remachine. Two additional companies have a practice of putting on a new front, and the method used on one railway is to saw the box apart and then weld it together to the original dimensions.

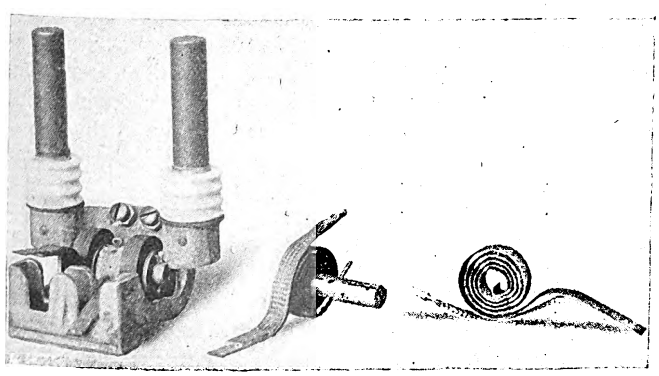

Fig. 13—A spindle and cotter-pin type of brush-holder is used on the Westinghouse No. 306 motor

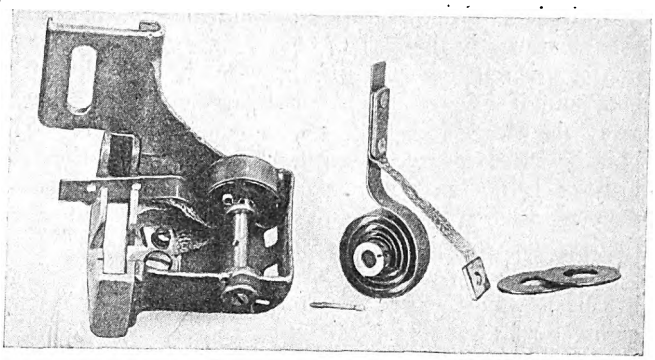

Fig. 14—Spindle and duo-cotter-pin type adjusting mechanism used with Westinghouse No. 508 railway motor brush-holder

In connection with the fitting of the carbons in the brush-holders, some information was obtained as to carbon-brush practice. Undercutting of the mica on railway motor commutators is now universal. This has permitted the use of a higher grade of carbon which has less grinding action. The recommended practice is for the use of a graphitized carbon brush. Generally a spring pressure of about 5 lb. per square inch of contact area is considered good practice. This gives a range of pressure on the carbons of from 5 to 7 lb., depending on their size. Information obtained showed a variation in spring pressure on carbons of from $2\frac{1}{2}$ lb. to 10 lb., the average, however, being 5 lb. per square inch. Where track is poor, resulting vibration necessitates increased spring tension in order to reduce sparking and the tendency for the motor to flash at high speeds. On some railways, marked improvement was obtained through raising the brush pressure to 7 and 9 lb. Under these conditions of increased pressure it was expected that the end wear of carbons would be quite rapid, but this was less with the high pressure than with the low under similar conditions of rough track. This was explained by the fact that with the increased pressure there is less burning at the commutator surface, and apparently the burning action wears away the brush more rapidly than mechanical friction from the increased pressure.

From the information obtained it was found that from 0 to 95 per cent of the brushes were replaced for side wear, the majority stating that on the average about 25 per cent are replaced for this reason. An attempt was also made to determine if the length of brush used had any effect upon the resulting side wear, the thought being that long brushes cause a greater side pressure due to the action of the contact tip. The greatest number of replies indicated a length of brush of from 2 in. to 3 in. The shortest length which a brush was reported as being worn before replacement was necessary was $\frac{1}{2}$ in. and the longest $2\frac{1}{4}$ in.

Causes of side wear appear to be in most cases dust and dirt and worn carbon boxes. Some other causes mentioned were irregularities in carbon box face, rough commutators, vibration, broken shunts, weak tension, lost motion in bearings, spring contact out of line with brush, worn pins in brush-holders and one-way operation of cars. The proportion of brushes which it is necessary to replace for breakage is negligible, according to the majority of the replies. In one reply, however, this was given as 20 per cent. In regard to the fit of the brushes when both brush-holders and carbons are new, ten railways reported that they specify a brush $\frac{1}{64}$ in. smaller

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than the box. Manufacturers recommend that the initial side clearance in the carbon box be from 0.006 to 0.008 in. If it is much less, the carbon will tend to stick in the box, and if greater it will rattle in the box and wear away the sides. There is also a tendency to chip and break with large clearance. The width variation of brushes is not so important. In some cases, brushes were reported with as much as $\frac{1}{16}$ in. smaller width than the box without causing any trouble in service.

Eighteen railways gave the life obtained from carbon brushes. The average maximum brush life for these eighteen railways was 40,905 miles and the average minimum was 16,748 miles. It thus appears that 20,000 miles

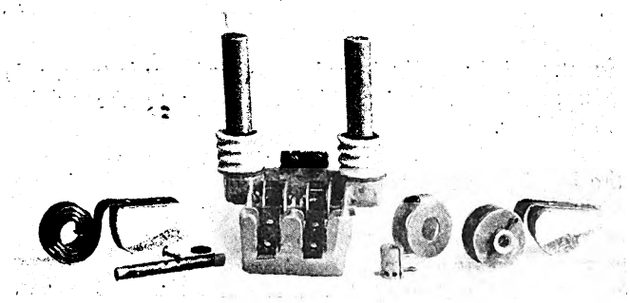

Fig. 15—Barrel and cotter-pin type adjusting mechanism for Westinghouse No. 319-B railway motor brush-holder

is a good average to be expected. Shortly after the ventilated railway motor was introduced, investigation of this point showed that most railways have experienced greater wear with the ventilated motor. Further investigation and studies made from the data available shows that this increased side wear in ventilated motors is due largely to the abrasive action of the dust and dirt drawn through the motor by the ventilating fan on the armature. On thirteen properties included in the present survey both ventilated and non-ventilated types of motors were used, so that a comparison of the performance in the same service was obtained.

The information on brush mileage included replies from fifteen properties that have both interpole and non-interpole motors in use. Some of the means suggested for reducing side wear of carbons in ventilated motors are given. It is advisable to select carbons carefully in order to secure brushes best suited to operating conditions. Some operators have done this by making tests of the various grades. Shunts to the carbons in some cases have seemed advantageous. Instances have been given where the use of one wide carbon instead of two narrow ones in the same brush-holder has reduced side wear. There is some disadvantage to this, as two separate carbons are less likely to cause flashing at the commutator.

Relative Wear of Brush-Holder Parts

An effort was made to accumulate data on the average life of various brush-holder parts such as castings, springs, shunts and spindles. Very complete information from twelve different railways showed an average life of 8.3 years for brush-holder castings, 4.4 years for springs, 3.5 years for shunts, and 4.2 years for spindles.

Shunts on carbon brushes have almost entirely disappeared. Of the entire 25 railways included but three still used them. Shunts on brushes have been replaced by a shunt on the brush-holder, which connects the contact tip on the finger with the main casting. This shunt must be large enough to carry the current and make a good electrical contact. It may be brazed, soldered or riveted. A good electrical path for the current prevents much of the side wear of the carbon and the burning of the carbon box. Therefore, it is very important to keep the shunts in good condition.

Only two railways out of 25 reported extensive breakage of shunts; the others have practically no trouble. Pressure springs are a larger source of trouble, seventeen of the 25 railways having some trouble from pressure springs losing their tension. Increased life and less loss of spring tension have resulted from use of a good quality of material, through checking tension at frequent intervals, and on some properties by changing from a bronze to a steel spring. Other practices that have increased the life of pressure springs are keeping commutators true, eliminating excessive wear in bearings, loosening spindles when they are too tight, and changing from the spiral spring type to the clock spring type.

In most types of railway motors the brush-holders should line up with the center line of the poles, and the distance from the center line of one brush-holder to the center line of the other should always be equal to one-quarter of the distance around the face of the commutator. The most common practice for checking alignment of brush-holders was that of lining the carbon box up with the commutator bars, thirteen railways using this method. Four others check alignment with jigs, and four check from the machined supporting surfaces. The ordinary method of checking spacing is by counting the commutator bars. Some railways use a special gage for their motors, and one railway uses a steel scale.

It is common practice to keep the underside of the carbon box from $\frac{1}{8}$ in. to $\frac{1}{4}$ in. above the commutator surface so as to prevent breakage of carbons. This is done by loosening the clamping block and moving the brush-holder until the correct setting is obtained. A piece of fiber $\frac{1}{8}$ to $\frac{1}{4}$ in. thick makes a handy gage. The nut which holds the clamping block should be tightened

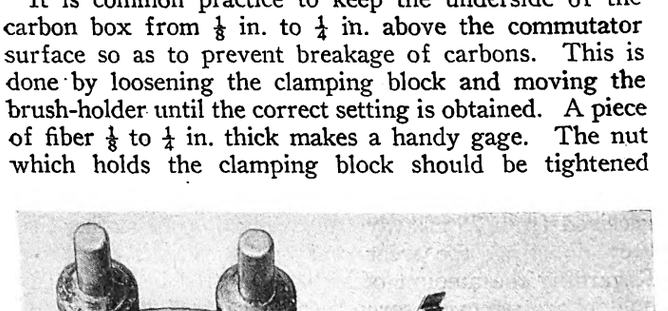

Fig. 16—Ten adjusting points are provided in this G.E. No. 80 barrel and cotter-pin type brush-holder

carefully so that the brush-holder will not come loose. From the information obtained, it appears that an average of $\frac{3}{16}$ in. is most used, although some railways specify $\frac{1}{8}$ in. Carbon dust and dirt are usually cleaned from brush-holders and insulators by wiping and by compressed air. Four railways use gasoline for cleaning and one uses a wire brush.

Out of 25 replies giving the extent to which brush-holders with replaceable carbon brush boxes are used, eighteen had some type of renewable box in service. In regard to advantages, the most general reply was that they were installed as a means toward economy, and that they are proving very satisfactory. Nine replies stated that the new type brush-holders had not been in service a sufficient time to determine advantages or disadvantages.

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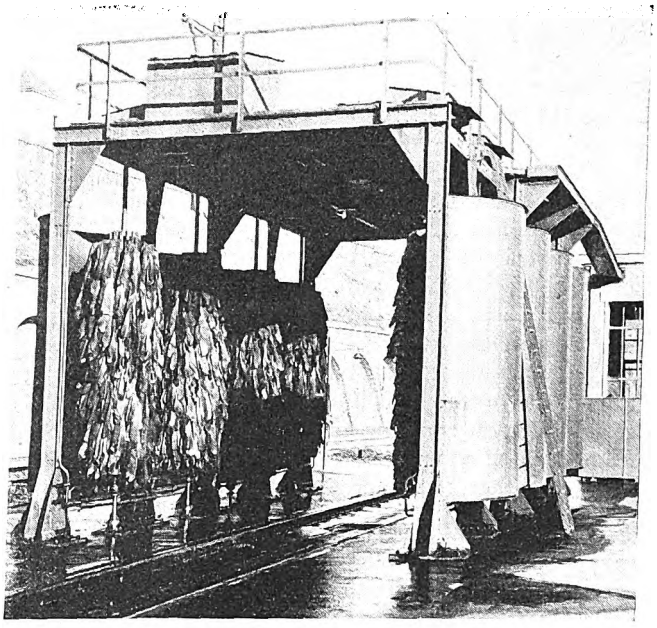
Machines Scrub *as Well as* Wash Cars

Novel devices differing somewhat from those developed in America have been perfected by European railways



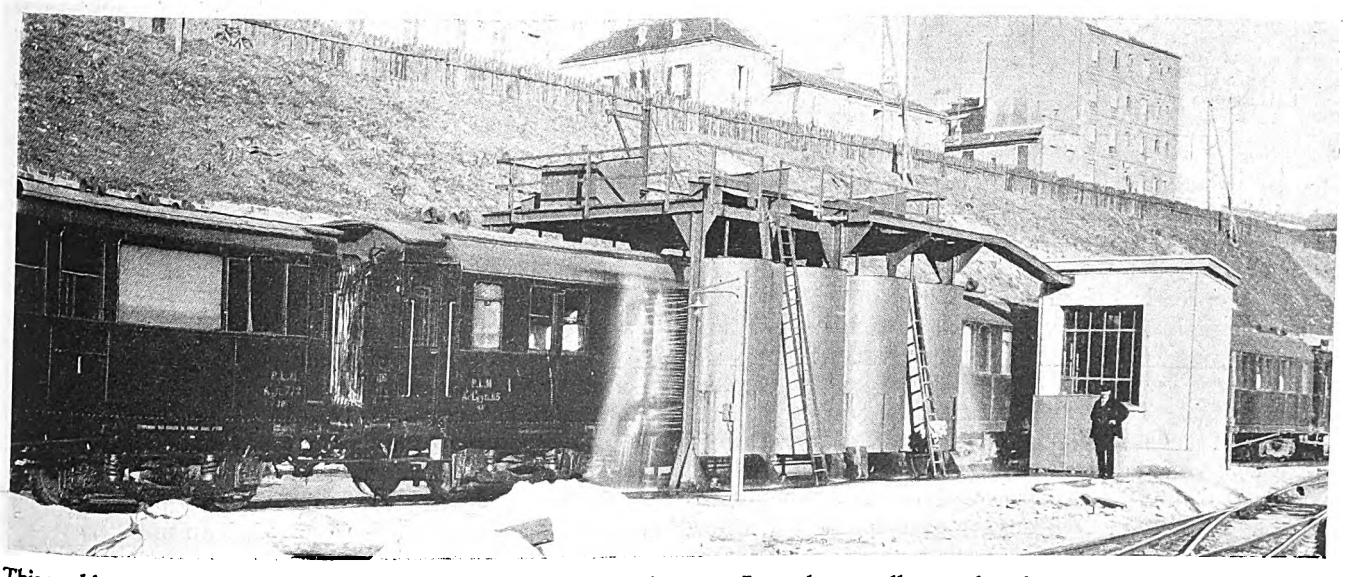
This view of the French washing machine shows the vertical shafts and wipers. Employees can reach the elevated platform above the machine for the repair of the machinery by means of an iron ladder

SEVERAL European car-washing machines have been described in this paper within the last few months. All have been based on the principle of directing sprays of water against the sides and ends of the car. This is the principle generally followed in car-washing machines used in the United States. Where this method is followed, it often is necessary to apply a scrubbing brush against the side of the car as well, so as to remove any spots of hard mud that resist the washing action of the spray.

With car-washing machines now in use on the Paris-Lyons-Mediterranean Railway, the Metropolitan Rapid Transit Railway of Paris, and the London Underground Electric Railway, manual scrubbing is not necessary except at the ends, as it is done by machine. The scrubbing is accomplished by long strip "wipers" attached to vertical revolving shafts driven by motors. As the shafts revolve, the strips, which are heavy with water, are thrown out horizontally by centrifugal force against the sides of the car. The car passes through four pairs of these wipers at the same time that it is sprayed from vertical pipes with perforations set at different angles so that the sides of the car are thoroughly washed down.

The accompanying illustrations show the washing equipment of the Paris-Lyons-Mediterranean Railway. There are four revolving shafts on each side of the track, each pair being driven by a 15-hp. motor. These shafts are driven at different rates of speed and in different directions. The first pair revolve at 49 r.p.m. and the ends of the wipers rub against the car in the direction opposite to that in which it moves through the machine. The second pair is driven at 46 r.p.m., the ends of the wipers touching the car moving in the direction in which the car is moved. The third pair moves in the same direction as the second pair, but at 59 r.p.m., and the fourth pair in the same direction as the first pair, but at 37 r.p.m. Water is sprayed both on the wipers and on the car body. The car passes through the washing machine at a rate of about 1¾ m.p.h.

Various types of material have been used for the wipers. Until very recently these wipers have been cut from the same cloth as used for the upholstery in the company's first-class and second-class compartments. This is a very high grade of textile upholstery goods, somewhat like mohair, and able to stand up well under



This washing machine is located at Bercy-Conflane just outside of Paris. It scrubs as well as washes the cars, which pass through at the rate of 1¾ m.p.h. Sometimes as many as 500 cars are washed each day by this machine, working 24 hours per day

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the hard service to which it is put. When this material is used the wipers have to be replaced only about once a month.

Unfortunately for the department responsible for the washing of cars, the company has given up the use of this material in its upholstery, so no more of it is available. Instead the maintenance department is testing some other kinds of cloth for this service. Some are proving more satisfactory than others but none has as yet given as good results as the mohair previously mentioned.

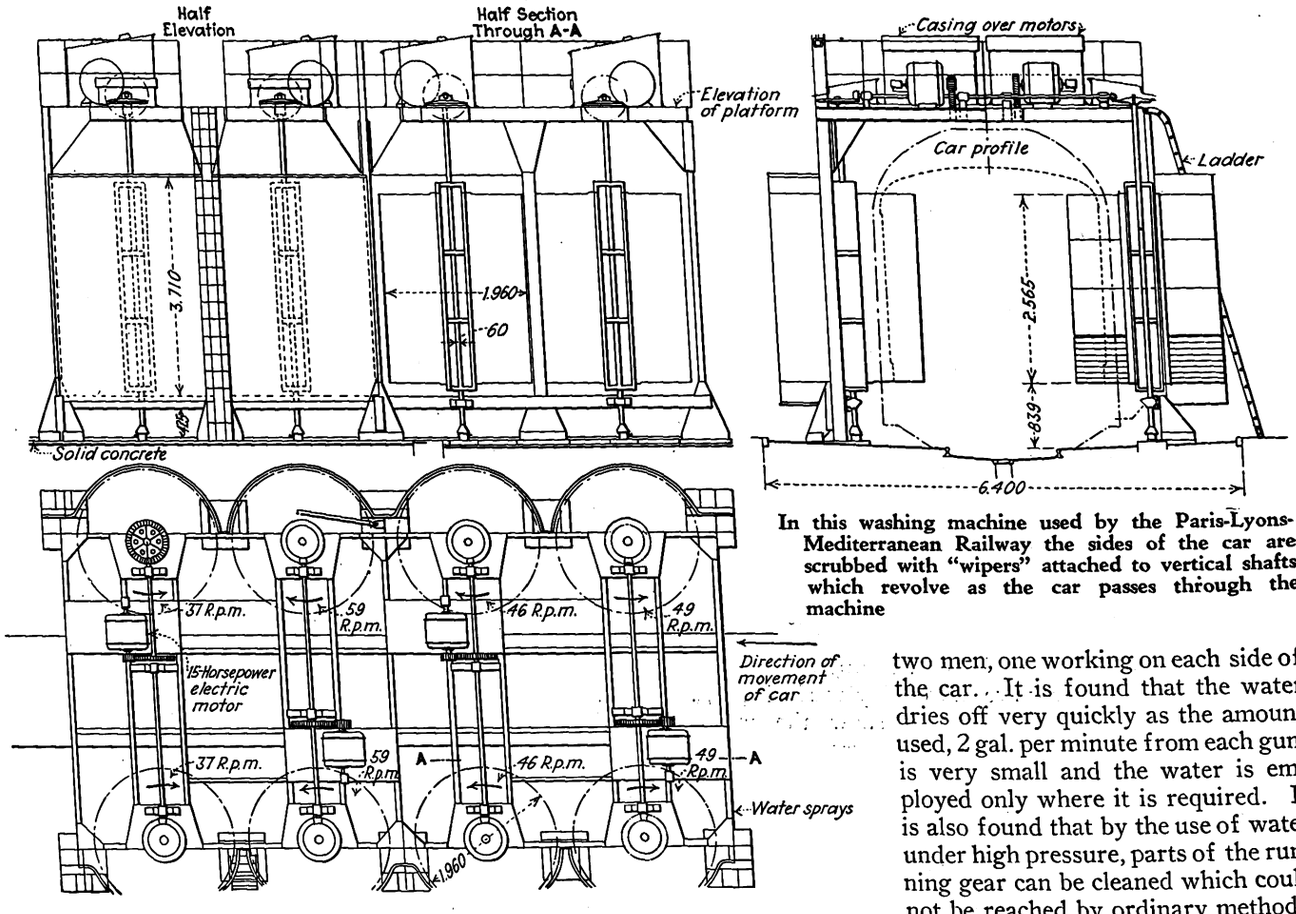
The washing machine of the London Underground Railways is installed at its Ealing Common depot and is very similar in construction. According to the London *Engineer,* the wipers on the four pairs of vertical shafts are soft leather, but other recent British periodicals speak of them as being of soft cloth. After leaving the revolving scrubbers and before emerging from the machine, the car passes through a further spray to complete the wash.

Each car goes through this machine every four to six days, in addition to the nightly cleaning that every underground car receives. The routine of the London cleaning machine may be summarized as follows: (1) The cars are passed through the machine every four to six days for the purpose of a wash down and for window cleaning. (2) The cars are periodically scoured to remove all dirt that may gradually adhere to the paintwork after which they are again passed through the machine.

The British technical papers also report that the Metropolitan Tramways Company of London has installed some so-called water spray guns for cleaning its cars. These guns are directed by hand and receive their supply of water from electric pumps which give a pressure of 300 lb. to the square inch. Hence, the water comes out of the gun with great force. It is conveyed from the main high-pressure supply to the guns by specially strengthened rubber hose which leads down from a roof pipe in the carhouse. The guns can be arranged to give either a fine spray or a powerful jet. The latter is used to clean dirt from the running gear under the car and the former for cleaning the windows and panels.

Besides the removal of dirt by the force of the water, some scrubbing of the sides and windows is done by hand at the same time that they are sprayed. A light brush, fitted on the end of an aluminum rod, 5 ft. long and attached to the spray gun, is used for this purpose. As this brush is so arranged that the jet sprays just below the brush, the two operations of spraying and scrubbing are reduced to one operation.

A double-deck car is washed in about two minutes by two men, one working on each side of the car. It is found that the water dries off very quickly as the amount used, 2 gal. per minute from each gun, is very small and the water is employed only where it is required. It is also found that by the use of water under high pressure, parts of the running gear can be cleaned which could not be reached by ordinary methods.



In this washing machine used by the Paris-Lyons-Mediterranean Railway the sides of the car are scrubbed with "wipers" attached to vertical shafts which revolve as the car passes through the machine

The JOURNAL is indebted to the Department of Commerce, Washington, for particulars of the French machine described, with samples of the wipers used.

New Records for Chicago Elevated

ONLY three or four years ago it was considered exceptional operation when as many as 900 cars entered the Loop over the lines of the Chicago Rapid Transit Company in an hour. Through the use of extended station platforms and longer trains, together with a rearrangement of train stopping points at Loop stations, operation has been speeded up until 1,000 cars an hour is now the daily average entering the Loop in the morning rush. A high record was set on the morning of May 27, when a total of 188 trains of 1,032 cars entered the Loop in the hour between 7:50 and 8:50 a.m.

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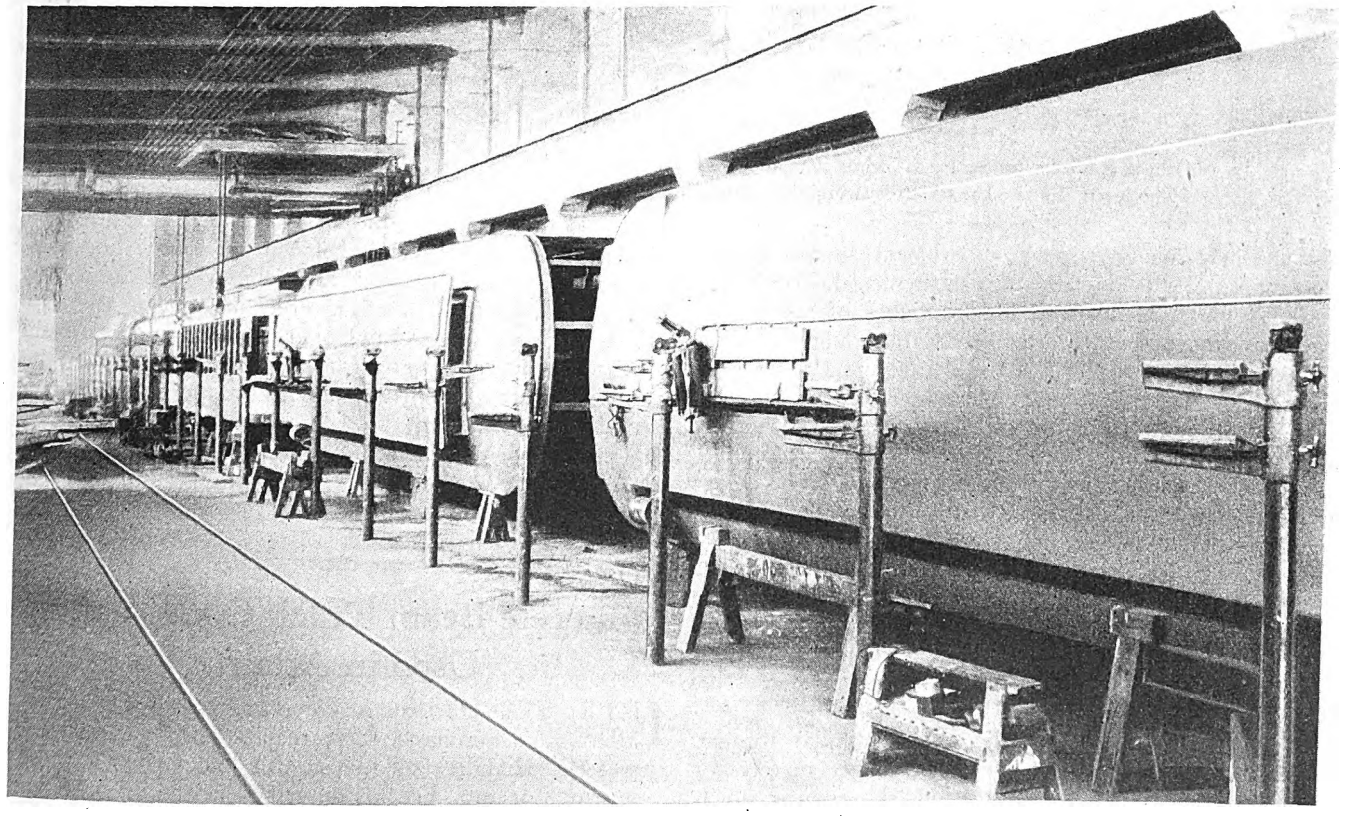
Turning Cars on Their Sides

Facilitates General Repairs

By means of cradles and specially fitted cranes entire car bodies are turned over readily in the Twin City shop. Work on the under side is made much easier



A row of cars in the Twin City shop. The two in the foreground are undergoing repair while they are turned over, while those in the rear have been turned back to the upright position for completion of the overhauling

CAR repair work has been facilitated in the St. Paul, Minn., shop of the Twin City Rapid Transit Company through the adoption of a plan of turning car bodies edgewise for general overhauling. The plan, which was devised by W. J. Smith, master mechanic, has made possible more effective inspection to detect rotted and corroded parts and has made the substitution of new parts comparatively easier.

When a car arrives at the shop for general overhauling it is first placed on an outdoor receiving track for stripping. Here the readily removable parts, such as doors and window sash, seat cushions and miscellaneous fittings are taken out and sent to the proper departments for inspection and repair. Either the trucks are removed and temporary trucks are substituted or the truck connections are loosened so that the permanent trucks can be removed readily. The car is then run on the transfer table and sent into the main repair bay, being spotted on one of the two tracks set aside for the purpose of general overhaul.

Two cradles are then placed around the car body. An accompanying illustration shows one of these cradles. In the picture it is resting on a wooden truck which has been designed for holding it so that it can be moved about the shop readily when it is not in position for holding a car in the process of turning. It will be seen that the cradle has two main members at right angles. These are steel forgings shaped roughly to fit the contour of the car. They are permanently joined together at right angles, so that when the bottom member is beneath the body sills the upright member will rest along the side of the car. A removable member serves as a diagonal brace, passing through the windows and connecting with the upright member at a point near the top of the window opening. On the opposite side it is fastened to the end of the horizontal member. A fourth member of the cradle, which is a round steel rod, is placed on the opposite side from the permanent frame. This rod is free to rotate as the car is turned.

When the cradles are placed in position about the body

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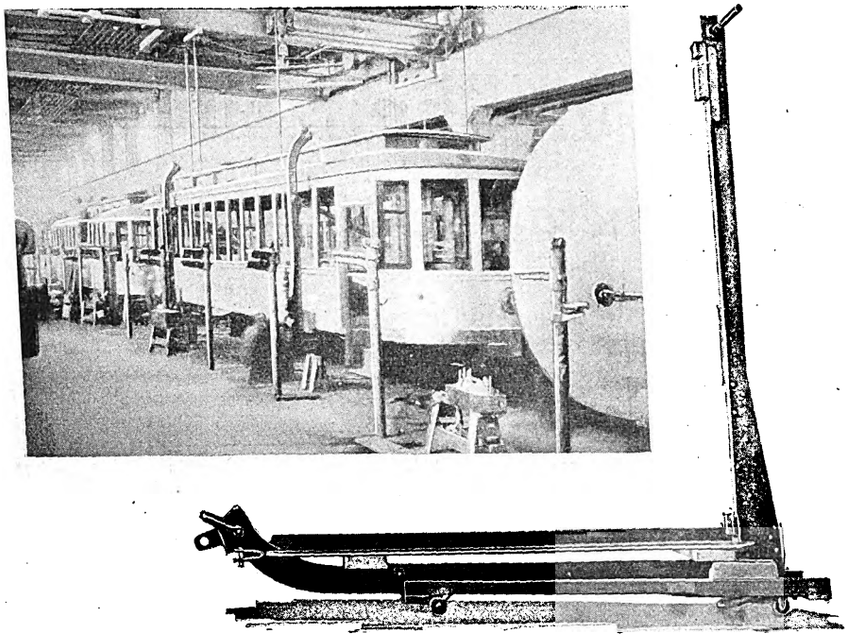

Two of these cradles support the car while it is in process of turning. The insert shows a car which is swinging on the cranes

they are held firmly in place with blocks so that there is no chance of the body shifting as it is turned. With the cradle in place, hooks from the carriages of the overhead traveling crane are attached to the cradle, one set at the bottom next to the sills and the other set at the top of the side frame adjacent to the roof and to the round rod. The body is lifted clear of the trucks, which are run out so that the body is free to move. The differential gear on the crane is then brought into play. This gear consists of a pair of drums with one set of cables reversed so that as one lifts the other lowers an equal amount. The body, swinging free, is then literally rolled over on its side by means of the differential gear. When it has been turned through an angle of 90 deg. horses are placed underneath and the body is lowered onto them. The cradles are then removed and the body is ready for inspection and repair work.

The process of righting the cars is similar to that described for turning them over, the motions merely being reversed. One of the illustrations shows a car which has just been righted and which still is swinging on the crane. The workmen are preparing to put blocking underneath the sills so that the body may be lowered from the crane and the cradle removed.

One of the views shows a row of cars in one of the bays. Those in the foreground have been turned over and work is being done on them. The ones in the rear have already been through the processes that are carried out on the side and have been righted once more, after which the work of reinstalling the parts which were removed takes place.

Advantages of Turning Cars Over

A number of advantages result from the use of the new process. The principal one is that it is possible for the workmen to get at parts of the car which ordinarily are inaccessible, such as the underframing and the equipment beneath the floor. Inspection of the framing is an easy matter when the car is turned over, and many defects have been discovered which never would be noticed if the inspector had to get into a pit and look upward, depending on a portable lamp for light. Rotted timbers and rusted hangers, air tanks and other metal parts have been discovered. Naturally it is easier to attach or remove equipment which is fastened beneath the car, and wiring can be done with comparative ease.

Another advantage which is seen is that it is possible to paint the under side of the car, getting a good penetration of a protective paint, which was not possible with the old methods. It is felt that this protective painting will result in a much longer life of the framing, the floor and the equipment mounted under the car.

While one gang is working on the equipment beneath the car, another force is able to work inside. This is made possible by laying planks along the side, which now is in the lowest position. Painters can clean and varnish the headlining so as to obtain a better finish in less time and with less fatigue than when the work is done overhead. At the same time attention is given to the roof. While this can be done in the ordinary repair process, it is felt that the workmen are able to do a better job while standing erect and facing the roof than when they must crawl over it, having a relatively insecure footing and being forced to work out toward the edge. This is particularly true with the monitor roof cars used in the Twin Cities.

Mr. Smith estimates that the new method has made a material saving in the cost of doing the work, in addition to the better class of workmanship that is attained.

Concrete Beam Track Construction Used in Atlanta

IMPROVED practices of track and roadway construction and maintenance have resulted in lower cost and increased reliability of service for the Georgia Power Company, Atlanta, Ga., as described in the brief of that company submitted in the competition for the 1927 Charles A. Coffin Award. There was a reduction in total derailments and split switches from 270 in 1923 to 129 in 1926.

An original type of concrete beam track has been developed. Benefits of using creosoted ties and timbers have been demonstrated and a system for the handling of sand has been inaugurated in which air pressure is substituted for manual labor.

With the concrete beam track a saving of 40 per cent of the concrete and 43 per cent of the rail cost has resulted. The ties and the base of the rails are supported by concrete. The saving in the rail cost is because with the continuous support a light 80-lb. A.S.C.E. section can be used.

After excavating to the subgrade of the paving, the ground is tamped thoroughly or rolled if necessary. After excavation for the beams, the rails and ties are laid. The rails are then bolted together temporarily and spiked with the company's combination tie plates on every tie. The joints are next thermit welded, the track is brought to grade on creosoted pine blocks and the exact

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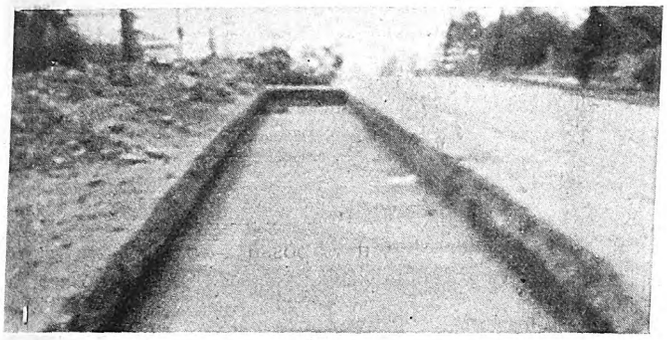
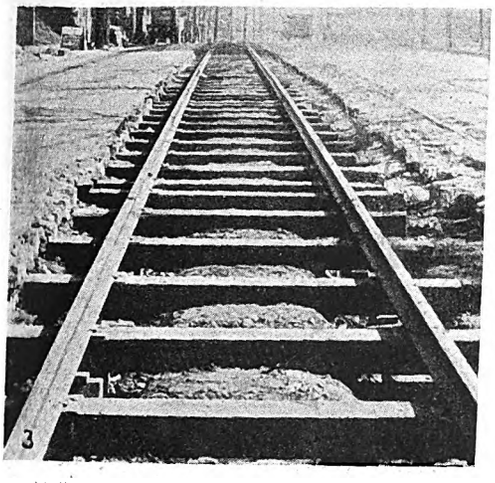
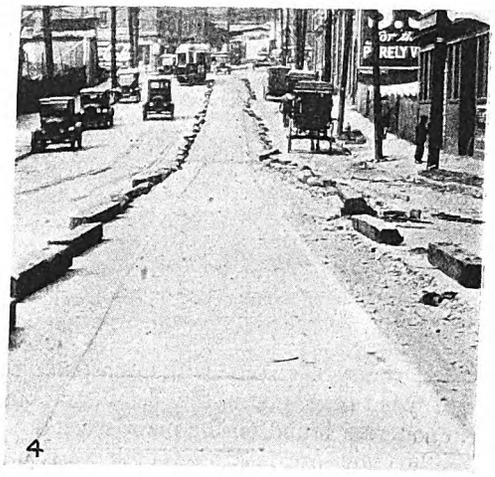




Four stages of concrete beam track construction

1. Trench excavated and rolled.
2. Earth mounds excavated.
3. Ties and rails ready for pouring concrete.
4. Finished construction.



final line and surface are adjusted by the use of oak wedges. Immediately following this the concrete structure and the paving are poured if concrete is to be used. The concrete is tamped thoroughly beneath the ties and rails. This method leaves the concrete in beams around the rails and ties, with mounds of earth in between.

This type of construction costs 15 per cent less than 7-in., 122-lb. rail on stone ballast, 29 per cent less than 7-in., 122-lb. rail on concrete beams of similar construction and 20 per cent less than 80-lb. A.S.C.E. rail on ties spaced 2 ft. apart and concrete laid without mounds between the ties.

Concrete Foundations Completed in 24 Hours

A process of laying concrete track and paving foundation under traffic has been developed by use of which jobs can be completed in 24 hours or less. The process consists of double tamping clean crushed stone 5 in. beneath the ties, after which new crushed stone is added to bring the foundation to the required height for the paving base. This is rammed thoroughly. The stone is then filled to its surface with 1 to 1½ grout to which 3 lb. of calcium chloride per sack of cement is added. The paving surface is laid immediately and traffic turned on it as soon as it is ready.

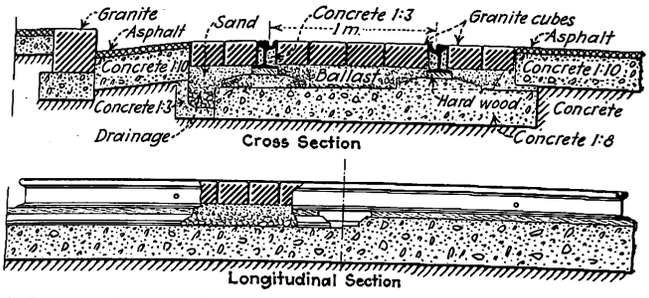
Improved use of electric welding in track construction has resulted in lower cost and increased efficiency. Worn flangeways in crossings have been filled in successfully with electric welding and ground to correct depth to make them flange bearing. The building up of the heels of switch tongues with electric welding is being done with excellent results. This treatment has been found superior to the common practice of using thin shims at the heels of switches. These and other uses of electric welding will prolong the life of the frogs, crossings and switches, with resultant saving in maintenance cost. Electric seam welding of joints is also done successfully.

Jugoslavia and American Track Differ in Many Respects

By Milan Manojlovitch

Chief Consulting Engineer Subotica Electric Railway & Light Company, Subotica, Jugoslavia

WIDELY divergent methods are used in the construction of track systems in America and Central Europe. In America street car rails are laid directly in concrete on some properties, utilizing ordinary T-rails. In Jugoslavia and Central Europe, in general, the use of concrete and asphalt in direct connection with rails is avoided as much as possible. It is the practice to place paving blocks of stone, ceramic material or wood in two or three rows on either side of the rail. By this



Cross and longitudinal sections of Jugoslavia track showing parallel under-construction and use of gravel ballast

method the breaking and crushing of concrete and asphalt which result from the elastic movement and the continual vibration of the rails under traffic conditions are avoided. This method is also employed wherever the rails themselves are placed on solid concrete foundations. It is only with this method that we have been able to prevent the deterioration of the concrete and asphalt. How-

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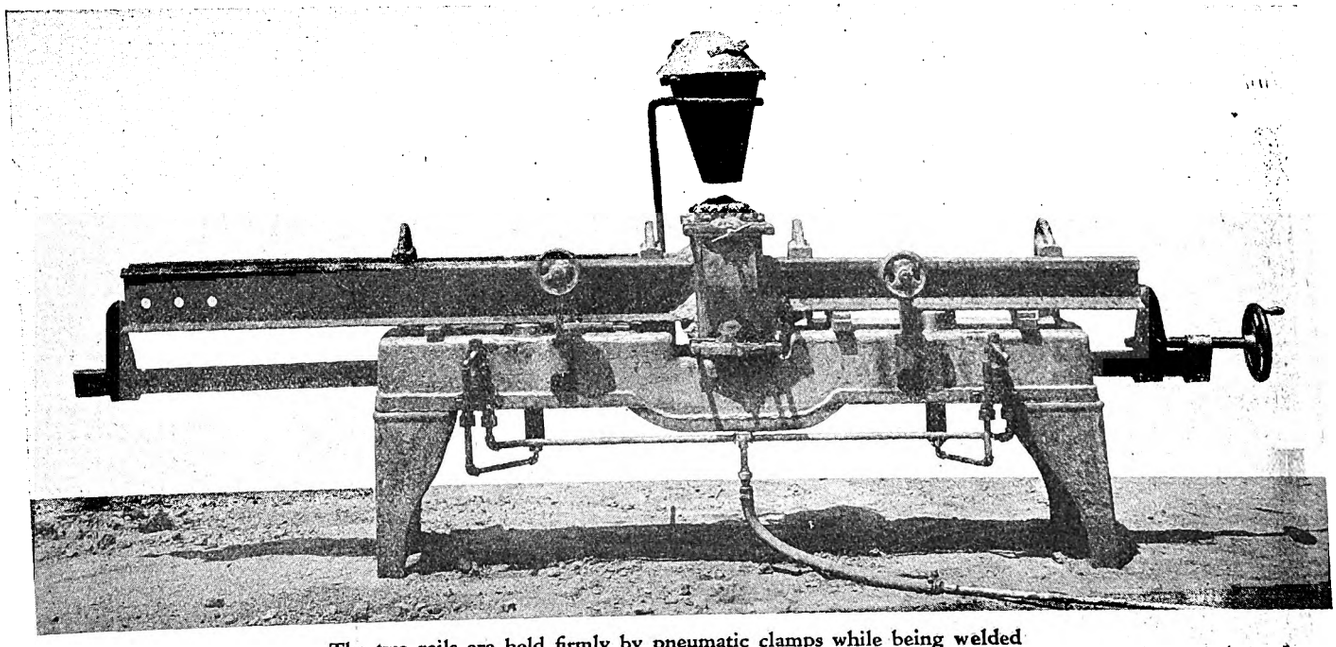


The two rails are held firmly by pneumatic clamps while being welded

ever, concrete streets without asphalt overcovering are not usual here, nor is the T-rail, track construction laid in concrete found on the main streets of our cities.

Our rails are laid on foundations immediately under and running parallel to the rail itself, whereas in America cross-ties are used. We use cross-ties only with track construction on stone ballast without concrete, on open stretches outside of the city limits. The rails are joined at frequent intervals by spacing bars, which serve also as the electric connection, but these do not replace the cross-ties above mentioned.

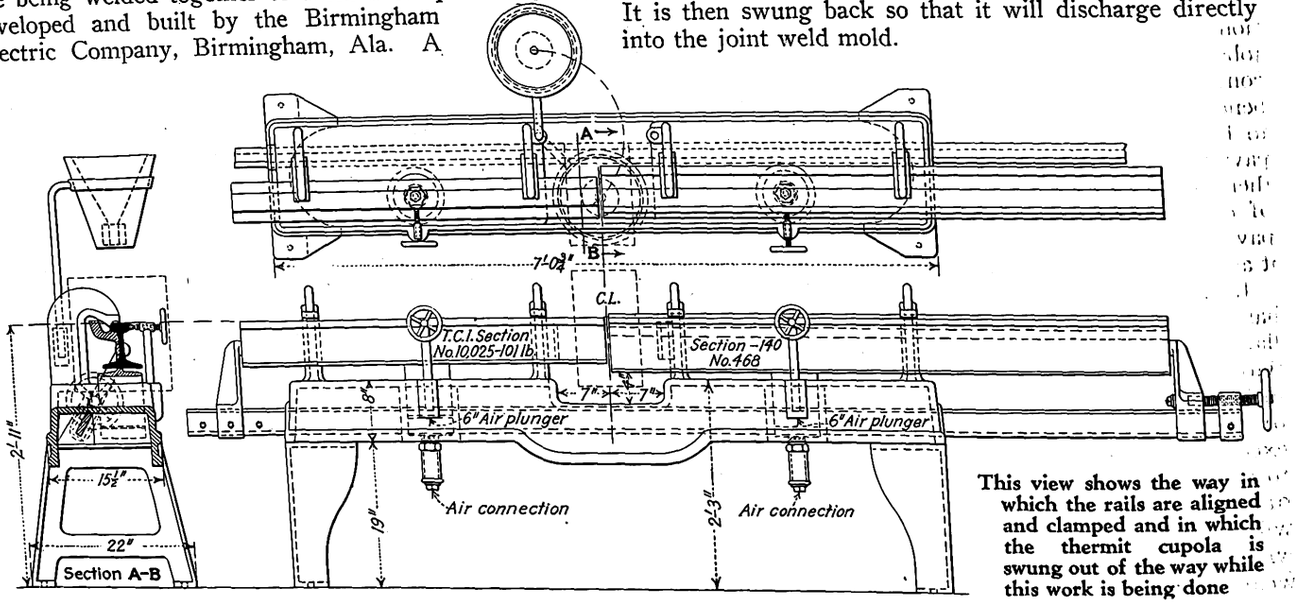
In paved city streets grooved rails with the border of paving blocks as above mentioned are used.

Clamps for Thermit Welding Compromise Rail Joints

CONSIDERABLE interest has been taken in the device for holding short sections of rail while they are being welded together to form a compromise joint, developed and built by the Birmingham Electric Company, Birmingham, Ala. A short account of it was published in the issue of this paper for June 18, 1927. The design of this device was brought about because of the large number of compromise joints required following the adoption of the A.E.R.E.A. 7-in. girder rail for replacing special work as it is renewed. As it was not found practicable to make the necessary compromise joints under traffic and as the work of lining them up and clamping them in position for welding them by hand took a long time, the machine was built.

Two illustrations of the machine, one of them a working drawing, are published herewith. The bedplate, which has four legs, has at the top four upright arms whose lower surfaces are planed accurately so as to align the tops of the two rails to be welded. On the opposite side from these arms are two screw clamps which, with two 6-in. air plungers below, hold the two rails firmly while they are being welded. Before these clamps are finely set up, the rail ends are forced together by a longitudinal screw clamp.

The thermit cupola is held in a hinged frame so that it can be swung aside while the rails are being aligned. It is then swung back so that it will discharge directly into the joint weld mold.



This view shows the way in which the rails are aligned and clamped and in which the thermit cupola is swung out of the way while this work is being done

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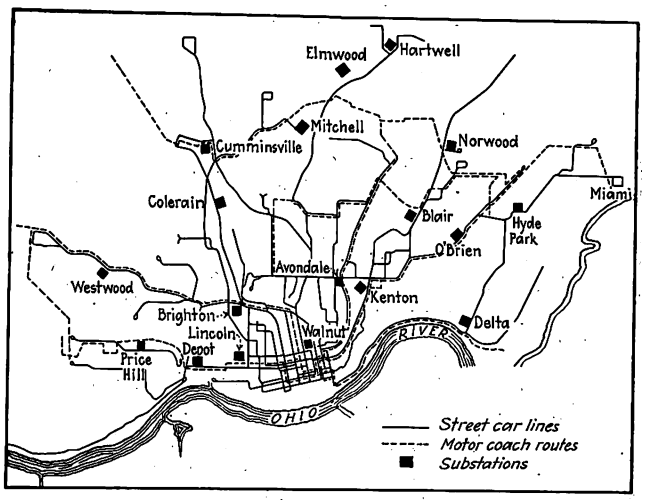
Cincinnati Adopts Supervisory Control for Power System

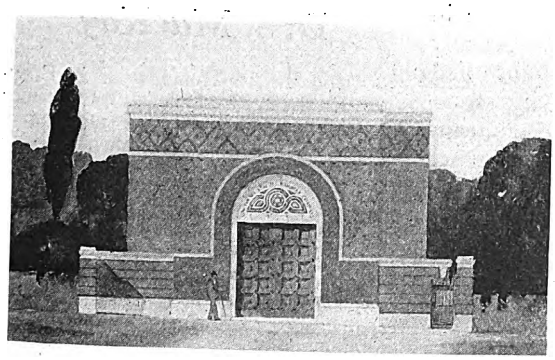
By Harley L. Swift
Superintendent of Substations Cincinnati Street Railway, Cincinnati, Ohio

COMPLETE revamping of its power distribution system has been decided on by the Cincinnati Street Railway. Under a plan which recently has been embarked on the street railway's power plant will be sold to the Union Gas & Electric Company of Cincinnati. Power for the railway will be purchased from this company and distributed through nineteen full automatic substations, all of which may be controlled by a centrally located load dispatcher or supervisor.

About half the power now comes from the railway's Pendleton generating plant at three-phase, 25 cycles, while the remainder is purchased from the power company at three-phase, 60 cycles. The Pendleton plant supplies five manual substations, while the power company supplies three full automatic stations, three manual stations and a converter in one of the 25-cycle railway substations.



The new Cincinnati railway power plan calls for full automatic supervisory controlled substations



Architect's drawing of the completed Colerain substation

The new plan calls for the abandonment of one substation, the remodeling of nine substations and the building of ten new ones. The average distance between the stations will be about 1 mile. The most remote station will be about 8½ miles from the load dispatcher's office, which will be adjacent to the Walnut Street substation, almost in the heart of the business district of Cincinnati.

The interior arrangement of all new buildings, and in so far as is physically possible of all the old buildings, will be exactly alike. All the equipment will be located on one floor and in one room. There will be no windows, but there will be two doors, one of which will be for emergency use only. To prevent further the transmission of noise the converter will be mounted on 2 in. of either Armstrong or Korfund machinery isolation cork and the ventilators will be made of Robertson's protected metal.

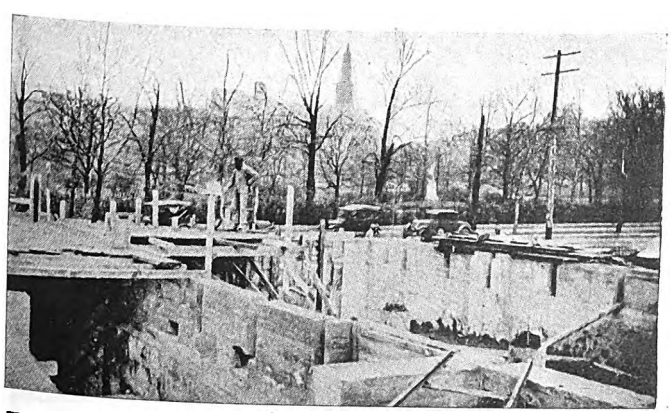
Both single-unit and two-unit stations will be built and ample provision will be made for future additional power requirements. The double-unit stations will be 38 ft. x 75 ft. and will contain two 1,500-kva. converters. The single-unit stations will be 38 ft. x 40 ft. and will contain either one 1,500-kva. or one 1,000-kva. converter. The transformers and high-tension bus structure will be inside the buildings.

Exteriors have been planned to fit the neighborhoods in which the stations are to be located. Several of the stations are to be in high-class residential districts where the City Plan calls for a set type of construction. Beautified structures have been planned for such instances, while all the buildings will be a credit to their localities.

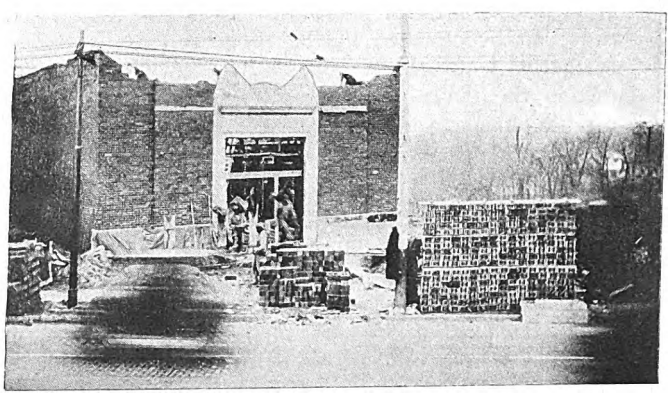
Four buildings are now practically completed, and contracts for five additional buildings are being let. It is expected that the entire program will be completed and in service by June 15, 1928.

The General Electric Company has the contract for furnishing all electrical equipment and for remodeling the present alternating-current controlled automatic stations to function under the General Electric direct-current scheme called for under the contract.

A later article will describe in detail the equipment, buildings, and operating plans.



The Lincoln Park substation as it appeared on Dec. 2. This indicates the character of the territory



The Westwood substation on Dec. 2. The general appearance may be seen from the illustration

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Monthly Prize for December in Maintenance Contest

Won by D. S. MacKay

Machine for changing tires of buses as developed by the Boston Elevated Railway awarded the $25 Monthly Prize for December in "Electric Railway Journal's" Maintenance Competition. Efficient system for dipping and draining field coils used by the Georgia Power Company received Honorable Mention.

CHANGING tires on buses is an every-day job and considerable equipment has been devised for simplifying the work. Most commercial equipment, however, is designed particularly for automobile garages and is not considered satisfactory for the heavy duty service of removing bus tires. A tire-changing machine designed particularly for bus maintenance as developed by the Boston Elevated Railway and as submitted in the maintenance contest by D. S. MacKay, supervisor of automotive equipment for the company, has a much stronger construction than the usual type of machine. It has the appearance of a very practical piece of equipment designed to give satisfaction in heavy duty service. Provision is made for tilting so that there is no necessity for lifting the wheel to its place, making it a decided labor saver. That five tires can be changed in the time formerly required for one commends the device for use. The machine provides a large bearing surface on the tires, and being designed particularly for bus service is strong and hardy in every way. It gives a simple and quick method for changing bus tires.

A description of the machine and its use were published in the Dec. 17 issue of ELECTRIC RAILWAY JOURNAL. It was submitted in the contest by D. S. MacKay, supervisor of automotive equipment for the Boston Elevated Railway, Boston, Mass.

A dipping and draining system for field coils as submitted by the equipment department of the Georgia Power Company, Atlanta, Ga., was awarded honorable mention by the contest judges. The equipment is arranged to take little space in the shop and provides an especially efficient method of dipping and draining. Besides conserving space, the equipment used given a neatness and cleanliness to the rather mussy operation of dipping and draining field coils. The labor involved is minimized through the use of this equipment and a maximum of the drippings are salvaged.

Competition for the December prize was very close. The items selected for the monthly prize and for honorable mention were two of the group published in the December 17 issue. An additional group, which will be judged for the $25 monthly prize for January, is included in this issue. One of these will receive the award and another one honorable mention. Results of the contest each month are published in the issue of the JOURNAL devoted to maintenance and construction, which is the third issue.

The following gives a summary of conditions for submitting material in the contest.

1. Any employee of an electric railway or bus subsidiary may compete.
2. The author does not need to be the originator of the idea.
3. Articles may be submitted by several persons or by a department.
4. Any maintenance practice or device for electric railway or bus repairs may be the subject.
5. Articles should be 100 to 200 words long with one illustration, and in no event longer than 400 words with two illustrations.
6. Illustration material may be in the form of drawings, sketches, blueprints or photographs. All sheets should be marked "Maintenance Competition."
7. Manuscripts should be mailed to the editor of ELECTRIC RAILWAY JOURNAL, Tenth Avenue at 36th Street, New York.
8. A prize of $25 will be awarded each month for the best maintenance idea in the group published. A minimum of $5 will be paid for each article accepted for publication. Manuscripts will be received until April 30, 1928.
9. Announcement of the winner each month will be made in the issue devoted to maintenance and construction (the third issue each month) following the one containing the item.
10. Additional details were given in ELECTRIC RAILWAY JOURNAL for April 16, pages 700-701.

D. S. MacKay

who won the December prize in ELECTRIC RAILWAY JOURNAL'S Maintenance Contest, is supervisor of automotive equipment for the Boston Elevated Railway. He has been in the employ of this railway and its predecessors since August, 1895. When he first became connected with the company, it was operated under the name of the West End Street Railway. During his long period of service he has served as wireman, repair man, motorman, inspector of buildings and car tracks, yard master, foreman in various car houses of the company, and in his present position as supervisor of automotive equipment. He was appointed to this latter position in 1924.

The Boston Elevated Railway at the present time maintains seven garages, four exclusively for buses. In these are stored a total of 416 pieces of various types of automotive equipment, which includes 242 buses. Mr. MacKay has evidenced a particular desire to utilize the latest improvements in equipment for expediting the handling of maintenance and repair work, and the many improvements to equipment which he has worked out, show the thoroughness with which he is considering the maintenance side of bus operation.

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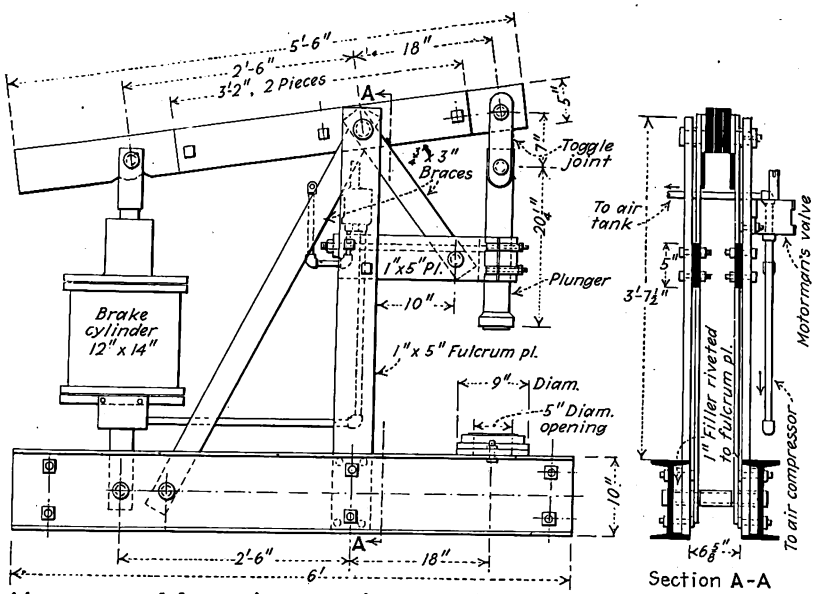
Electric Railway Journal Maintenance Data Sheet

ROLLING STOCK—ELECTRICAL—34

Press Saves Time in Bearing Removal*

By J. A. Duffy
Superintendent of Equipment Monongahela West Penn Public Service Company, Fairmont, W. Va.

WE USE a home-made press in our shops for very many forcing operations, the principal one of which is pressing out bearings. With this the source of power is a 12-in. x 14-in. brake cylinder which is attached to one end of a rocker arm, while the other end supports the plunger used in the forcing operation. The base for the press is made of two 10-in. I-beams. The brake cylinder is pivoted to this in order to avoid the use of a slotted or oblong hole in the power arm, as we have found the pivoted construction better. The plunger has a center bearing support, so as to insure accurate vertical movement. It is connected to the power arm through a toggle joint. Air pressure is controlled by an ordinary straight air brake valve.



Air press used for various pressing operations in shops of Monongahela West Penn Public Service Company

*Submitted in Electric Railway Journal Prize Contest.

Electric Railway Journal Maintenance Data Sheet

ROLLING STOCK—ELECTRICAL—36

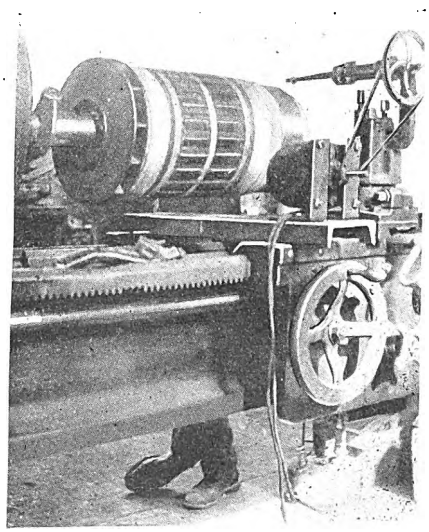
Efficient Commutator Slotting Device*

By H. A. Albin
Superintendent Lancaster, Ephrata & Lebanon Street Railway, Lebanon, Pa.

COMMUTATOR slotting is done by an inexpensive and efficient undercutting device constructed and used in the shops of the Lancaster, Ephrata & Lebanon Street Railway. It can be used to slot the commutator of any armature which can be swung in a lathe.

A shaft with a commutator saw on one end and a pulley on the other is supported by two bearings attached to an upright of a piece of steel strap, bent to U shape. The other upright side of the iron is clamped to the binding post of the lathe in which the armature is swung. With this arrangement it is unnecessary to have a guide to keep the saw from damaging the commutator segments, as when the lathe is centered the running of the carriage back and forth provides the desired accurate alignment.

The shaft on which the saw is mounted is driven by a small electric motor which is fastened to a U-shaped bracket, which in turn rests on the carriage of the lathe. The motor is belted to the pulley on the shaft.



Commutator slotting device used in the shops of the Lancaster, Ephrata & Lebanon Railway

*Submitted in Electric Railway Journal Prize Contest.

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Electric Railway Journal Maintenance Data Sheet

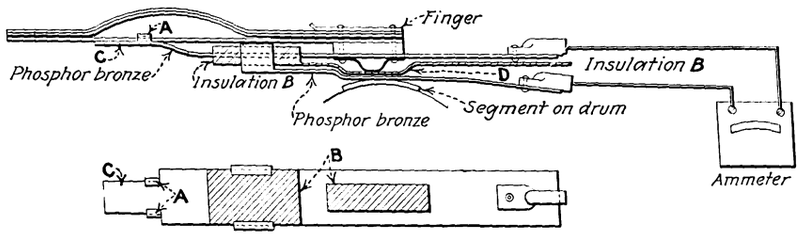
ROLLING STOCK—ELECTRICAL—35

Double Contact Current Measuring Device*

BY ARTHUR E. CLEGG
Foreman Electrical Department, San Diego Electric Railway, San Diego, Cal.

CAUSES of trouble in electrical circuits on cars of the San Diego Electric Railway are located by a double contact current measuring device which the electrical department uses to obtain an ammeter reading. This device can be put in the circuit of a drum switch very quickly in the following manner:

The finger of the switch should be raised just high enough to pass the end of the current measuring device under it so that the contact tip of the finger will rest in the slot designated on the accompanying illustration as *B*. The clips *A* are then fastened to the finger spring and the spring effect of *C* bearing against the finger spring makes a good electrical contact. A heavy-treated canvas is used for insulation to separate the two contacts *C* and *D*, which are made of phosphor bronze.



Double contact current measuring device

The contact tip of the finger resting in slot *B* bears down on the contact *D* as it comes in contact with the segment of the drum. To provide leads to the ammeter at the end of each contact a terminal is fastened by means of a rivet and soldering. Leads of convenient length and proper carrying capacity are soldered into the terminals. These leads can be brought through the car window and connected to an ammeter when the double contact measuring device is inserted in either the reverser or motor cut-out switch circuit if these are of drum type.

*Submitted in ELECTRIC RAILWAY JOURNAL Prize Contest.

Electric Railway Journal Maintenance Data Sheet

ROLLING STOCK—ELECTRICAL—37

Phosphor-Bronze Armature Bearings Profitable*

BY R. T. CHILES
Master Mechanic
Cumberland County Power & Light Company,
Portland, Me.

ONE of the most profitable maintenance practices in use on our property is that of operating phosphor-bronze armature bearings without babbitt or tin lining. We have been using these bearings for the past five years and have had wonderful results. For the year 1926 the following was the average armature bearing mileage:

Type Motor	Number of Motors in Active Service	Bearing Miles
GE-67	114	52,189
GE-80	138	80,705
GE-201 G, GE-203A, GE-247-B	140	173,965

The composition of the metal used in the bearings is 80 per cent copper, 10 per cent tin, 9 per cent lead and 1 per cent phosphorus. Bearings are bored 0.015 in. larger than the armature shaft and all armature shafts are inspected carefully for trueness. After the armature is installed in the motor frame particular care is taken to see that it can be rotated by hand.

In fitting armature bearings to the frame head of box frame motors the armature bearing is pushed into the frame head with a wheel press. We have never had to take a car out of service to renove an armature for bearing wear in our box frames type of motors. The equipment is overhauled completely on an average once every three years and during this overhauling, if we find an armature bearing worn 0.041 in larger than the armature shaft size it is removed. Usually our removals are for pinion end bearings being loose in the frame head. Armature shaft wear has never been unusual.

*Submitted in ELECTRIC RAILWAY JOURNAL Prize Contest.

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Electric Railway Journal Maintenance Data Sheet

ROLLING STOCK—ELECTRICAL—38

Periodic Testing of Field Coils Reduces Trouble*

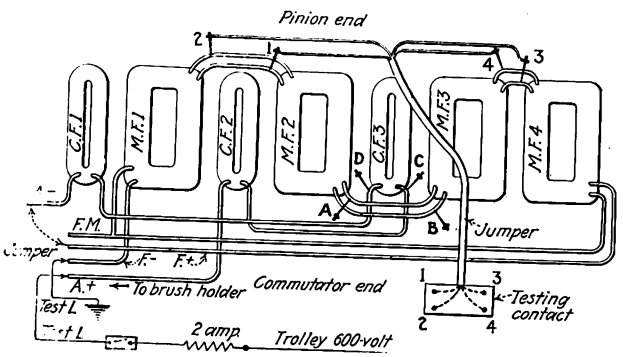
BY FARRELL TIPTON

Electrician San Diego Electric Railway, San Diego, Cal.

IT IS the practice of the San Diego Electric Railway each time a motor is removed from a car to give the windings an electrical insulation test. Fields are tested by the drop potential method to give the insulation resistance between turns. To facilitate this work a test jumper shown in the accompanying illustration has been devised. With this one man can make the drop potential test in a minimum time.

The jumper is made of four No. 14 gage wires, 36 in. long. These are cabled together within 15 in. of the test pins. One end of each wire is fastened to a small sharpened steel pin by means of two nuts and a brass washer on which a symbol is stamped. The other ends of the wires are fastened to terminals on the testing board. These have symbols corresponding to those on the other ends at the test pins. Additional test pins are used to make millivoltmeter contact.

The test board is made of bakelite. It is 5 in. long, 3 in. wide and ½ in. thick. Brass machine screws are used for terminals and testing contacts. In using this test equipment the pins are inserted at given points and the drop across each coil is read separately by placing the test points of the millivoltmeter on terminals as listed in the accompanying table:



Details of field coil testing device

Field Coil Under Test	Points of Contact
Commutating field No. 1	A— and D
Commutating field No. 2	A+ and C
Commutating field No. 3	D and C
Long main field No. 1	F— and 2
Short main field No. 1	F.M. and 1
Long main field No. 2	B and 2
Short main field No. 2	A and 1
Long main field No. 3	B and 4
Short main field No. 3	A and 3
Long main field No. 4	F.M. and 4
Short main field No. 4	F+ and 3

Submitted in ELECTRIC RAILWAY JOURNAL Prize Contest.

Electric Railway Journal Maintenance Data Sheet

ROLLING STOCK—TRUCKS—18

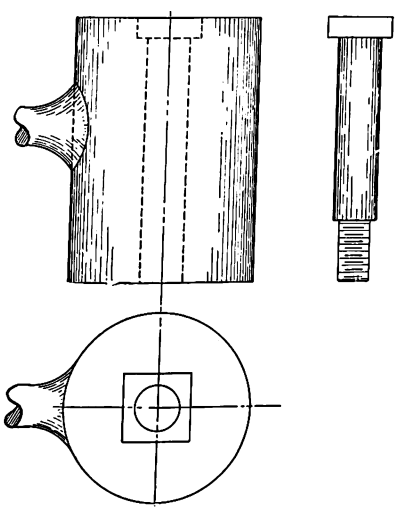
Die for Making Truck Swing-Link Bolts*

BY CHARLES HERMS

General Foreman San Diego Electric Railway, San Diego, Cal.

SWING-LINK bolts used for trucks by the San Diego Electric Railway are made in a die shown in the accompanying illustration. It is made of a piece of an old axle and is the exact length of a finished bolt. The hole of the die is bored about 0.005 in. larger than the desired shank of the bolt to allow for expansion while hot.

Cold-rolled steel stock is used and this is cut off just long enough to allow for a full head. A dozen or more of these pieces are thrown into the fire and heated to a white heat. They are then removed one at a time, and before inserting in the die each one is quenched in cold water so that just enough of the stock remains hot to form the head. The piece is then placed in the die and usually two light blows from a steam hammer finishes the head. By inverting the die the bolt slips out freely.



Die used to form swing-link bolts for trucks

After the bolts are headed they are sent to the machine shop and the ends are turned down and threaded. Where cold-rolled steel is used it is not necessary to turn the shank. After threading, the bolts are drilled for cotter pins and are then sent back to the blacksmith shop for case hardening.

The total cost of material and labor, including overhead charges, amounts to 40 cents per bolt.

Submitted in ELECTRIC RAILWAY JOURNAL Prize Contest.

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Electric Railway Journal Maintenance Data Sheet

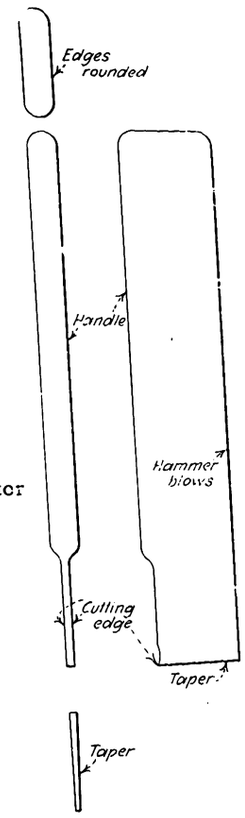
ROLLING STOCK—ELECTRICAL—39

Commutator Wire-Slot Cleaning Tools*

By Frank Volenec
Armature Winder Omaha & Council Bluffs Street Railway, Omaha, Neb.

When an armature is stripped there is always more or less old solder remaining in the commutator wire slots which must be removed before rewinding. This is usually considered a tedious task by the repairmen. In the shops of the Omaha & Council Bluffs Street Railway a set of slot-cleaning tools has been made for the different types of armatures to do this work easily and thoroughly. These tools were made from old files ground to the proper shape. The tools are all similarly shaped but of different thicknesses, depending on the width of the wire slot to be cleaned.

Shaped like a shaper tool and having three cutting edges, the tool in one operation cleans the sides and bottom of the slot. For clearance the tool is tapered away from each cutting edge. The corners of the file teeth at the upper end of the tool are ground away to make a handle for holding the tool while it is driven through the slot by means of a hammer.



Commutator wire slot cleaning tool

*Submitted in Electric Railway Journal Prize Contest

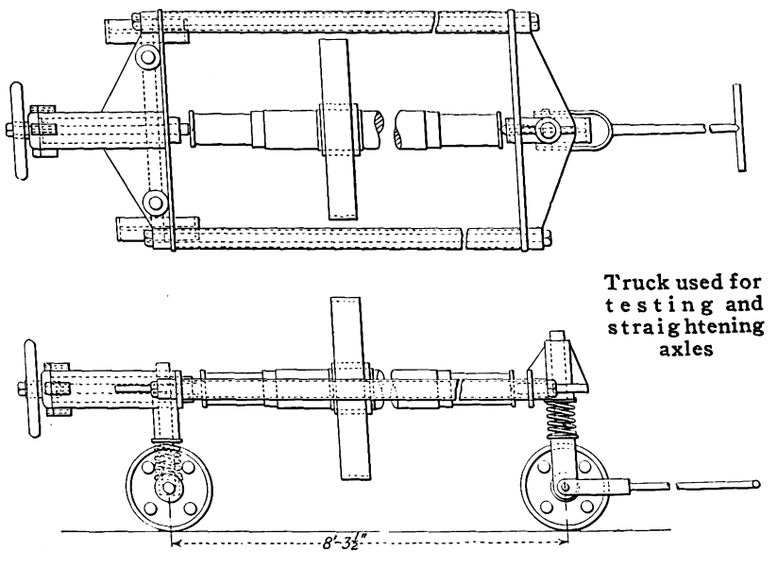
Electric Railway Journal Maintenance Data Sheet

ROLLING STOCK—TRUCKS—19

Centering Truck for Testing Car Axles*

By A. Taurman
Superintendent of Equipment Way and Structures
Birmingham Electric Company,
Birmingham, Ala.

The accompanying line cut shows an axle centering truck which has proved of particular convenience on our system. The truck was constructed in our shop to test axles after the wheels had been removed, to see that they were perfectly straight. Where the testing shows that the axle is bent the truck is pulled over to a vertical hydraulic press and the straightening is done readily without removing the axle from the truck. After the straightening the axle can be tested in the centers on the truck without removal. The spring between the frame of the truck and the axle allows the truck to be depressed when the straightening operation is carried out and eliminates the necessity of taking the axle from between the centers. This method of handling bent axles eliminates the necessity of heating them, as it has been found that they can be straightened very much better cold. The practice of the railway heretofore was to heat axles and put them in a lathe, which required considerably more time and handling than the present practice.



Truck used for testing and straightening axles

*Submitted in Electric Railway Journal Prize Contest.

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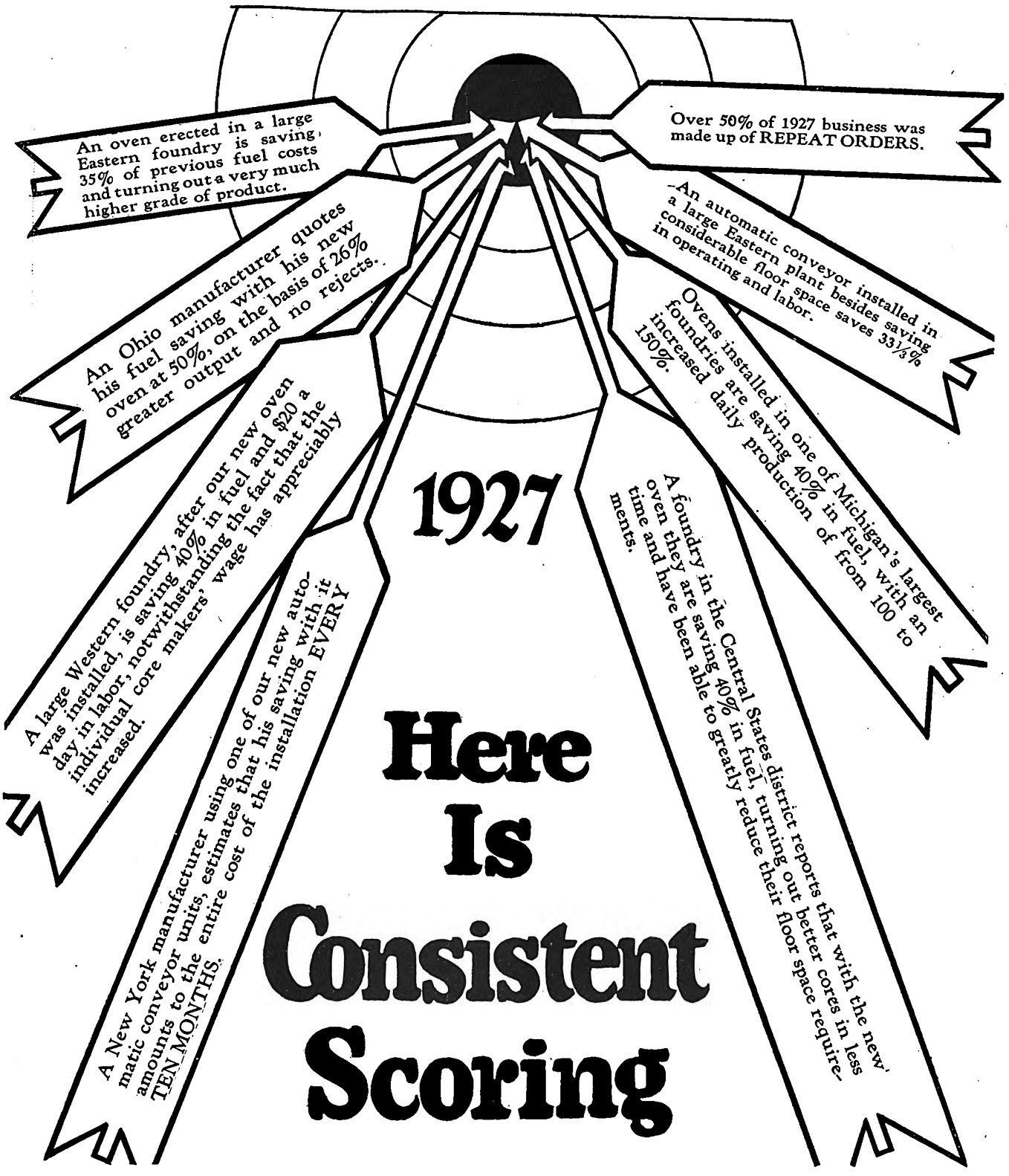

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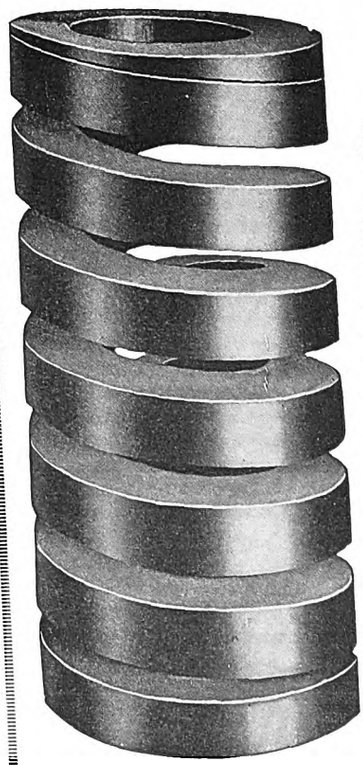

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Electric Railway Journal Maintenance Data Sheet

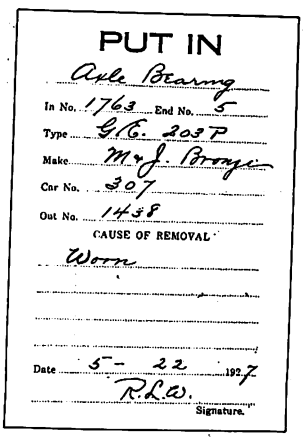
ROLLING STOCK—MISCELLANEOUS—20

Card Records Show Condition of Equipment*

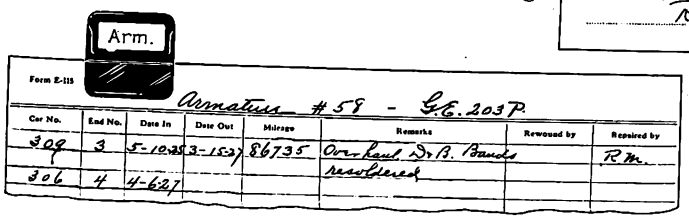
By Ed. C. Kelly
Shop Foreman Virginia Public Service Company, Hampton, Va.

CAR repair records are kept in a compact and readily available form in the shop of the Virginia Public Service Company, Hampton, Va. Cards 5 in. x 8 in. are used indexed with Smith's "Opnwindo" steel guides. The cards are kept in cases 10 in. x ½ in. x 17 in., which provide a capacity for 1,000 cards.

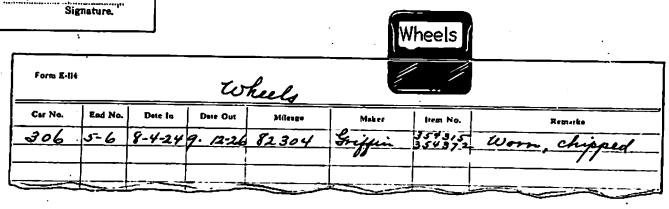
All bearings, armatures, wheels, etc., are given serial numbers in their respective classes. To aid in following frequent changes in equipment the various parts and position on the cars are identified by numbers stamped near the pedestal jaws, or some other convenient place. Starting to number at one end, odd numbers are used on the left side and even numbers to the right.


PUT IN
Axle Bearing
In No. 1763 End No. 5
Type G.E. 203P
Make M & J. Bronze
Car No. 307
Out No. 1438
CAUSE OF REMOVAL
Worn
Date 5-22 1927
R.L.W.
Signature.

In keeping records, armature bearings, axle bearings, wheels, etc., are entered on separate cards and are filed with each car record. As armatures are changed more frequently than other pieces of equipment these are given individual cards. Cards are filed with the record of the car in which the armature is operating, spare armatures being held under "shop" heading. Upon completion of a job involving a change of equipment permanent record is made on a "put in" slip.


Arm.
Form E-115
Armature #58 - G.E. 203P

Car No.	End No.	Date In	Date Out	Mileage	Remarks	Rewound by	Repaired by
309	3	5-10-25	3-15-27	86735	Over haul D & B. Bands resoldered		R.M.
306	4	4-6-27					


Wheels
Form E-114
Wheels

Car No.	End No.	Date In	Date Out	Mileage	Maker	Item No.	Remarks
306	5-6	8-4-24	9-12-26	82304	Griffin	354315 354372	Worn, chipped

Record cards and forms as used for equipment on the Virginia Public Service Company's lines

*Submitted in Electric Railway Journal Prize Contest.

Electric Railway Journal Maintenance Data Sheet

TRACK AND WAY DEPARTMENT—15

Concrete Ties Effect Saving*

By Louis T. Botto
Superintendent Maintenance of Way Department, San Antonio Public Service Company, San Antonio, Tex.

BY THE installation of concrete cross ties in place of wooden ties, a considerable saving in first cost has resulted on lines of the San Antonio Public Service Company, San Antonio, Tex. In the concrete construction it is general practice to build a temporary track around the work in order that the new construction may have fifteen days in which to harden. A job now in progress, however, is at a point where the company's tracks cross the switching yards of the I. & G. N. Railway. At this point it is impractical to build a temporary track, so the following method is used:

Every other wood tie is removed and in its place a concrete tie is cast. The construction includes a Carnegie steel tie, M-23, as the core. Tie bolts are placed in the bolt holes and are spot welded to the tie. The tie is then placed in position and blocked up under the rail, using bricks and shingles for blocking. Steel reinforcing wire is placed around the tie and spot welded in several places to the top of the tie. A form is then built around the tie and a 1:2:4 mixture of concrete poured, making the completed tie 8 in. x 10 in. x 7 ft. long. Ties are kept damp by sprinkling for fifteen days, after which the forms are removed and the regular tie clips are applied. Ties are tamped up with air tampers and the nuts are tightened down on the ties in the usual manner. Wood ties are then removed and the remaining concrete ties are installed.

Concrete cross tie construction used by the San Antonio Public Service Company

No difficulty has been experienced in surfacing and lining track with concrete ties and it has been found as easy to do maintenance work as with the ordinary wood tie. It is felt that this type of construction is very desirable in close proximity to railway crossings which require frequent tamping.

*Submitted in Electric Railway Journal Prize Contest.

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Electric Railway Journal Maintenance Data Sheet

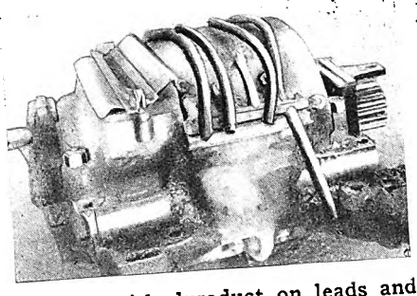
ROLLING STOCK—MISCELLANEOUS—21

Method of Bringing Out and Fastening Motor Leads*

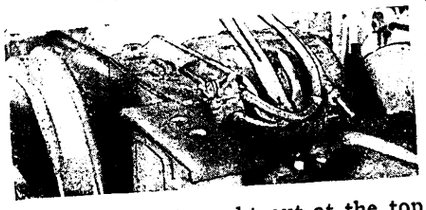
By Equipment Department
Georgia Power Company

CONSIDERABLE trouble has been experienced on cars operated by the Georgia Power Company from axle jumpers becoming oil-soaked and grounding. Motor leads also get down on the axle and cause trouble with split frame motors. To remedy these conditions duraduct is installed over the leads and brackets are welded on the motors for fastening wooden blocks to cleat the leads.

In addition to the cleating, all motors now being overhauled are rewired so as to eliminate the axle jumpers. The bottom field lead is run back around the motor case through steel bushings welded inside the case and is brought out through a hole in the top of the frame along with the other motor leads.



Motor with duraduct on leads and wood block supports



All leads are brought out at the top sides of the motor

Steel bushings through which the leads are passed are welded to the motor frame and the leads are then bound together with tape to hold them securely. This not only holds the motor leads away from the axle but prevents vibration. This change is being made on Westinghouse type 101-B and C, 112-B-2, 306 and 307 motors.

*Submitted in Electric Railway Journal Prize Contest.

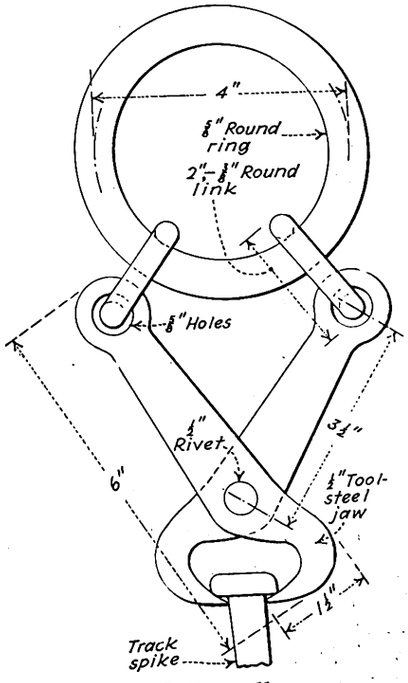
Electric Railway Journal Maintenance Data Sheet

TRACK AND WAY DEPARTMENT—16

Convenient and Powerful Spike Puller*

By Joseph Mercier
General Foreman Track Service Division Montreal Tramways, Montreal, Canada

A POWERFUL spike puller that may be utilized even where shoulder tie plates or cramped quarters interfere with free movement of the claw bar has been devised by the track service division of the Montreal Tramways, Montreal, Canada. Two tool steel tongs about 6 in. long with hardened jaws, shaped to grasp the head of a spike, are attached to a 4 in. diameter by ⅝ in. round mild-steel ring with two heavy links. With the jaws adjusted to grip the head of the spike, a pull on a bar slipped through the ring as it rests on the adjacent rail will draw out the most stubborn spike. This has proved a great time saver.



Spike puller

*Submitted in Electric Railway Journal Prize Contest.

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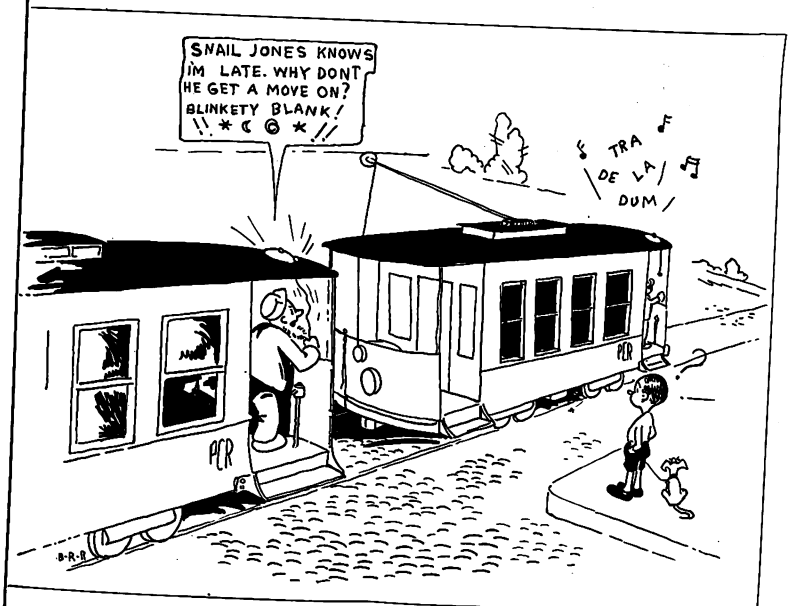
Adventures of

Old Man Trouble

on the

Hicksville Railway



Stay a safe distance behind the car ahead, even if you do have to be a few minutes late

If you wish to eliminate rear end collisions, follow the three Don'ts.

1—Don't let your cars play "chase the leader."

2—Don't let a car on a slow schedule go ahead of a car on a fast schedule.

3—Don't let a car on time cut in ahead of a car that is late.

ELECTRIC RAILWAY JOURNAL will be glad to furnish press proofs of this page for posting on bulletin boards and will supply electrotypes of this series at cost for use in company publications.

J. M. Zimmerman and E. L. Proctor, West. Elec. & Mfg. Co.

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New Equipment Available

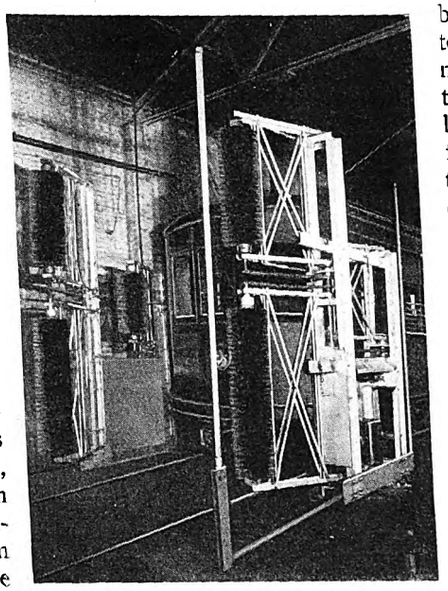
Beaver Valley Machine Scrubs as Well as Washes Cars

CAR washing machines other than those in which water is sprayed on the cars from vertical or horizontal pipes are not usual in this country. Even the rather primitive spraying devices are by no means common among electric railway companies. A machine which scrubs as well as washes the car is very much of a novelty here, although there are machines of this kind in Europe.

A combined scrubbing and washing machine for electric railway cars in use in the New Brighton, Pa., shops of the Beaver Valley Traction Company is shown in the accompanying illustration. It has been patented by two employees of the Pittsburgh Railways and the one illustrated is the second to be installed. It resembles one used by the Pittsburgh Railways and described in the JOURNAL for March 12, 1927. It consists essentially of three hinged arms on each side of the track, each set of arms carrying a vertical revolving brush, driven by chains from a vertical shaft driven by a motor. The arms are hinged so that they can be set to fit the width of the car to be washed. They have a range, in and out, of 9 in. on each side. In addition on each side of the track are two vertical perforated pipes. They supply the water sprays for washing.

After the arms are set to the proper width of the car the operation of the machine is entirely automatic. As the car approaches the washing machine a trip switch is thrown, starting the sprays and setting the revolving brushes in motion. One of the vertical pipes on each side sprays the car before it passes between the brushes. The second vertical pipe on each side sprays the car after it has passed the revolving brushes. The water in each case is directed toward the center of the track.

The water supply is arranged so that the water from the first set of vertical pipes can be chemically treated before it is sprayed on the car. The chemical used is the Imperial Company Simplex Cleanser, which is diluted to various degrees, depending upon the condition of the car and the extent to which it has to be cleansed. The second pair of vertical spraying pipes are supplied only with fresh water. Their purpose is to wash off all traces of the cleanser and the dirt which it has dislodged.



This Beaver Valley machine washes and scrubs the cars at the same time. It is adjustable for various widths of cars

Old Westinghouse D-2 E.G. compressor motors are used for driving the revolving brushes, which are fitted with soft bristles.

Single Operator Type Welder

WELDING by one man is facilitated by a new machine announced by the General Electric Company, Schenectady, N. Y., as the latest addition to its standard line of welding equipment. The machine, which is rated at 300 amp. for one hour with 50 deg. C. temperature rise, includes a ball bearing motor-generator set with flexible coupling. Field control for the generator has been eliminated. The generator panel includes an ammeter and a voltmeter, but no field rheostat such as is customarily used. The meters have metal fronts except for the glass over the scale, thus minimizing the possibility of breakage. Motor starters for 60, 50 and 25-cycle motors are of the inclosed magnetic type. The direct-current motors use a simple resistance starter with a time switch.

The generator is designed to permit belt, motor or engine drive and for either stationary or portable use. It bears the General Electric designation WD-300-A.

Put "No-Nox" in your maintenance, so your cars will operate with no-knocks.

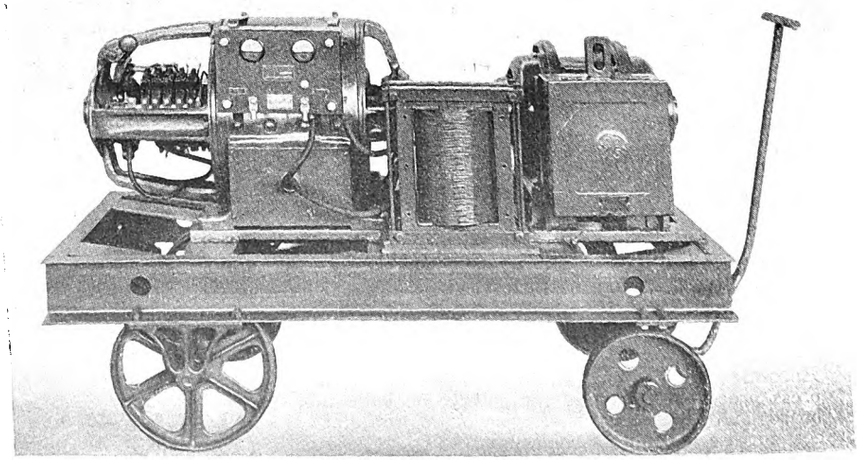
Improved Design of Reverser Finger

IMPROVEMENTS in reverser fingers for replacing the old V-shaped finger have been made by the Westinghouse Electric & Manufacturing Company. Use of this new type is said to result in better operation, longer life of both fingers and contacts and reduced maintenance cost. Other advantages claimed for the new design are:

1. Elimination of the riveted joints which loosen in service and cause heating, resulting in burning of fingers and contacts.

2. The shunt carries the current and the spring does not become overheated. This insures constant spring pressure throughout the life of the finger.

3. There is greater range of deflec-



New arc welder with alternating-current motor drive

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tion within the prescribed pressure limits so that longer service is obtained from contacts.

4. The use of tinned contact surfaces reduces the resistance of the finger and prevents localized heating.

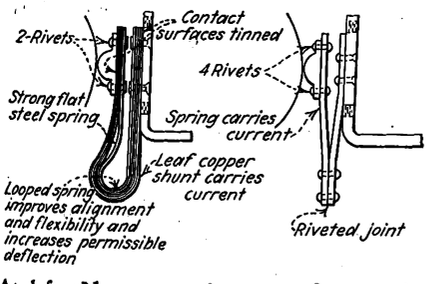
5. Contact tips are renewed more easily than with the older type. Due to contact surfaces being tinned, only two rivets are necessary to hold the contact tips of the fingers.

6. Greater flexibility insures proper alignment and maximum contact between contact tips and drum segments.

7. Longer life of finger segments is obtained due to reduced finger pressure and reduced heating.

The new reverser fingers have been standardized so as to use the fewest parts possible and permit the use of a relatively small number of finger assemblies to replace the old fingers. For the standardized design all copper tube terminals are fastened to the finger bases by means of through bolts. The tap bolts used on a few of the old fingers are eliminated.

For many purposes the new finger is entirely interchangeable with the old V-shaped finger. On some types of reversers it is necessary to change the strap terminal back of the finger when adopting the new finger. On a few other types, the fingerboard



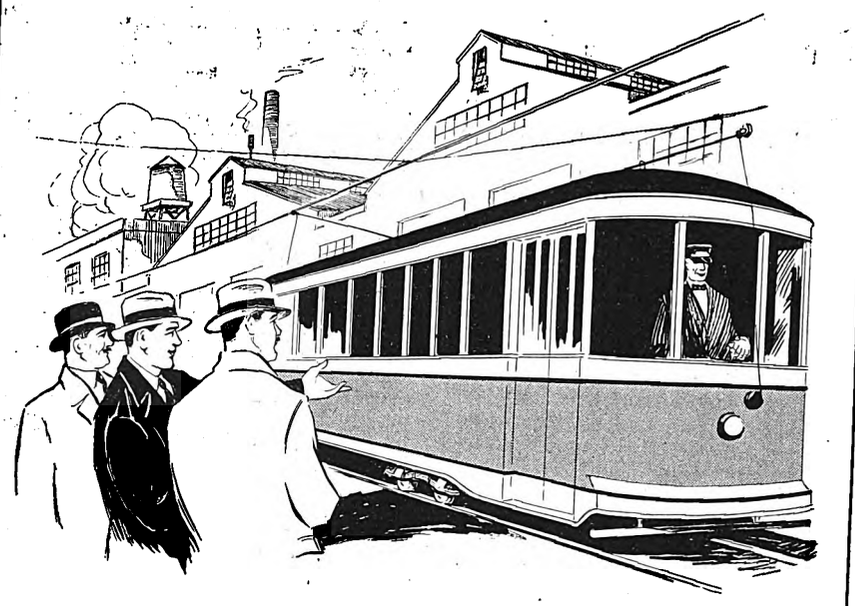
At left—New type of reverse finger. At right—Old finger which is replaced

must be changed or modified to permit its use with the new fingers. In every case the new fingerboard assembly using the new finger is interchangeable with the old fingerboard assembly.

When it is found necessary to replace the old V-shaped fingers, it is recommended that the reverser or changeover switch be changed to use the new finger. This should be done by substituting the new fingerboard assembly for the old fingerboard. At the same time the changeover is made the diameter of the drum should be checked. On type 173, 178, 279 and 284 reversers the finished diameter should not exceed 3½ in. Wherever the contacts have been worn as much as $\frac{1}{16}$ in., they should be replaced with new cars.

Dick Prescott Paints a Car

And Starts a Train of Thought



SOME two weeks following the discussion of car painting by Dick Prescott, assistant superintendent of the Consolidated Railway & Light Company's shop, and Steve White, the carpenter shop foreman, Dick Prescott called up Mr. Milburn, the general manager, and announced that a sample car, painted in the new color scheme was ready for his inspection.

Early in the afternoon Mr. Milburn appeared at the shop and Dick promptly had the newly painted car run outside the building where it could be easily seen in the outdoor light from various angles.

Mr. Milburn stood back some distance from the car while Dick and Steve waited silently for his comments.

"Dick," he said finally, after looking at the car for some time from several positions, "I think that's an immense improvement. I can't understand why we didn't do something of this sore a long time ago."

"That's easily explained, Mr. Milburn," replied Dick, "I think there are two reasons: first we have never given much thought to the matter of improving the appearance of cars with paint, and in addition to that we have used colors which would stand up longest and hold costs to a minimum."

"That is probably true, Dick, but I believe that it was false economy. After all, paint cost is a comparatively small item in equipment maintenance. Even if we added to that item considerably it would not amount to very much money in comparison with the improvement that it makes in the appearance of our cars."

"I agree with you, Mr. Milburn. I think the added cost of keeping our cars well painted in attractive color combinations would be more than compensated for by the more friendly public attitude toward our service. That is an important step toward actual increased patronage by the people of the city."

"Dick, there isn't any question but that you're right. I think this makes an immense improvement in our cars. It will be good business to start in painting this whole group to attract some favorable attention while we are considering that new lot of cars we've discussed several times."

"Fine! Mr. Milburn, we'll get busy at once," exclaimed Dick. "These most recent cars of ours will look pretty good on the street when we finish with them. I do hope, though, that soon we can get rid of some of those old battleships on South Street. They're costing us a lot of money to operate and maintain, to say nothing of the way they look and ride."

"Come down to the office Friday morning, Dick, and we'll go over those figures again that you compiled some time ago," Mr. Milburn replied as he walked to the corner to board a street car bound down town.

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Association Activities

Midwest Association Members Optimistic

Papers and discussions at the Hot Springs convention considered government ownership, pending legislation, franchises, transportation and mechanical problems

OPTIMISM prevailed at the sessions of the Midwest Electric Railway Association convention, which was held in Hot Springs, Ark., on Monday and Tuesday of this week. The 150 delegates present from seven states, including Utah, Colorado, Oklahoma, Missouri, Kansas, Nebraska and Arkansas, were given a most cordial welcome by Mayor Leo P. McLaughlin of Hot Springs and F. Leslie Body, manager of the Chamber of Commerce. F. G. Buffe of Kansas City, vice-president of the association, sounded the optimistic keynote of the street railway business today in responding, declaring that no organization could be in a state of hopeless decline which represented an investment of $6,000,000,000 and carried more than 16,000,000,000 passengers annually.

Comparing industrial conditions in the United States with those in foreign countries, J. B. Wootan, editor *Public Service Magazine*, Chicago, attacked government ownership of industries as inconsistent with the principles enunciated in the constitution and voiced by the founders of the nation.

In presenting a résumé of legislation pending in the present Congress Leslie Vickers, economist of the American Electric Railway Association, explained something of what the national association is undertaking to do through its New York and Washington offices to safeguard as well as to promote the interests of the electric railway industry. He urged that every effort be made locally in each state to keep its senators and congressmen adequately and intelligently informed concerning the problems of the electric railway properties in their particular territory.

F. Forman of Stone & Webster, in speaking of building a sales instinct in trainmen, stressed the value of public speaking instruction in helping organize an intelligent, judicious-minded body of railway employees.

There were two interesting luncheon sessions held the first day of the convention, which were turned into round-table discussions of transportation and mechanical problems with T. G. Kelly of Fort Smith, Ark., and W. J. Martin of Miami, Okla., as group leaders. The banquet was the social feature of Monday's sessions and was addressed by Former Governor Charles H. Brough of Arkansas, who warned against the doctrine of government ownership, and by Walter M. Ebel, editor of the Hot Springs *Sentinel-Record*, who expounded sympathetically on the relationship which should exist between the press and the public utilities.

Tuesday's session was opened with a paper on the place of the bus in urban transportation, delivered by D. E. Druen, superintendent of bus maintenance of the Kansas City Public Service Company. Present-day bus construction, in the opinion of Mr. Druen, is fast incorporating qualities of increased speed, improved riding and greater ease of handling and is obtaining them with an ever-increasing simplicity in mechanical construction.

Lantern slides illustrating a large number of the latest developments in modern electric railway equipment were presented and discussed briefly by Claude L. Van Auken, managing editor of *Electric Traction*. About 50 slides were employed to show the product of the foremost car builders. Problems of municipal transportation, particularly as they concerned the functioning of the service-at-cost type of franchise in effect for the past eighteen years in Cleveland, Ohio, were discussed in a comprehensive paper by C. M. Ballou, City Railway Commissioner of Cleveland.

Entertainment for the ladies attending the convention was not overlooked. In addition to a splendid luncheon for them on the first day they were taken for a drive over the city of Hot Springs and to near-by points of interest through the courtesy of the Chamber of Commerce. One of the interesting features of the convention was the exhibition of the new 38-passenger, 110-hp., twin motor coaches manufactured by the F. R. Fageol company of Kent, Ohio.

The program of the convention was concluded with a short business session, during the course of which Charles Gordon, editor of ELECTRIC RAILWAY JOURNAL, was called upon by President Cobban of Miami, Okla., for a few remarks. Mr. Gordon spoke of the feeling of optimism which has begun to make itself felt in the ranks of the railway industry and expressed it as his belief that the decline in the business of providing mass transportation with street cars has been pretty well halted, with consequent hope for a return to more prosperous days.

COMING MEETINGS OF *Electric Railway and Allied Associations*

***Jan. 25*—Central Electric Railway Master Mechanics' Association, Hotel Gibson, Cincinnati, Ohio.**

***Jan. 25-26*—American Railway Association, Motor Transport Division, organization meeting, Palmer House, Chicago, Ill.**

***Jan. 25-27*—Electric Railway Association of Equipment Men, Southern Properties, Roosevelt Hotel, New Orleans, La.**

***Jan. 26-27*—Central Electric Railway Association, Hotel Gibson, Cincinnati, Ohio.**

***Jan. 31*—New York Electric Railway Association, midwinter meeting, Hotel Commodore, New York, N. Y.**

***Feb. 13-17*—American Institute of Electrical Engineers, winter convention, Engineering Societies Building, 33 West 39th Street, New York, N. Y.**

***Feb. 17-18*—Central Electric Railway Accountants' Association, Hotel Gibson, Cincinnati, Ohio.**

***March 23*—Maryland Utilities Association, annual meeting, Emerson Hotel, Baltimore, Md.**

***May 2-5*—Southwestern Public Service Association, Dallas, Texas.**

***May 6-12*—Union Internationale de Tramways, de Chemins de Fer d'Interet Local et de Transports Publics Automobiles, biennial meeting, Rome, Italy.**

***June 6-8*—Canadian Electric Railway Association, annual convention and exhibits, Toronto, Canada.**

***July 8-12*—Public Utilities Advertising Association and International Advertising Exposition, Detroit, Mich.**

SEPT. 22-28, 1928
American Electric Railway Association, 47th annual convention, Cleveland, Ohio.

New England Motor Bus Association Formed

ELECTRIC railways and steam railroads have formed the New England Motor Bus Association, affiliating themselves with the American Automobile Association. The object is to promote co-operation and to give the public information about the motor coach transportation service, keep in touch with legislation and to work with the regulatory bodies in New England. Among the members are the following companies:

Union Street Railway (New Bedford), the Connecticut Company (headquarters,

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New Haven), Worcester Consolidated, Springfield Street Railway, Boston & Maine Transportation Company (motor coach subsidiary B. & M.), Boston Elevated Railway, Middlesex & Boston, Interstate Limited Motor Coach Company (Fall River), Holyoke Street Railway, United Electric Railways (Providence), New England Transportation Company (motor coach subsidiary New York, New Haven & Hartford Railroad).

Officers have been elected as follows:

President, A. P. Russell, president New England Transportation Company; first vice-president, H. F. Fritch, president Boston & Maine Transportation Company; second vice-president, Edward Dana, general manager Boston Elevated Railway; third vice-president, W. J. Flickinger, vice-president the Connecticut Company; fourth vice-president, A. E. Potter, president United Electric Railways, Providence; secretary, R. M. Sparks, vice-president Interstate Limited Motor Coach Company; treasurer, E. S. Wilde, president Union Street Railway, New Bedford.

New York Association Program

DETAILS of the program of the mid-winter meeting of the New York Electric Railway Association are now available. The meeting will be held at the Hotel Commodore, New York City, on Thursday, Jan. 31.

Subjects at the day session, beginning at 10 o'clock a.m., are:

President's address.

"High-Speed Traction Motor," by N. W. Storer, consulting railway engineer Westinghouse Electric & Manufacturing Company.

Discussion, led by G. L. Kippenberger, vice-president and general manager St. Louis Car Company, and H. L. Andrews, assistant engineer railway department, General Electric Company.

"Local Transportation Must Keep on the Move," by Lucius S. Storrs, managing director American Electric Railway Association.

Informal discussion from the floor led by W. H. Sawyer, past-president A.E.R.A., and R. F. Carbutt, president Metropolitan Section A.E.R.A.

"Do Traffic Lights Relieve Congestion," by R. W. Emerson, vice-president and general manager Cleveland Railway.

"Control of Traffic as it Affects Street Car Operation," by K. W. Mackall, engineer Crouse-Hinds Company.

"Moving Traffic," by Hon. Philip D. Hoyt, First Deputy Police Commissioner, in charge of traffic, City of New York.

"Traffic Signals and Their Effect on Street Railway Operation," by H. N. Smith, consulting engineer Bureau of Gas and Electricity, Syracuse, N. Y.

"Brakes as They Affect Schedule Speed and Accidents," by E. R. Fitch, district engineer Westinghouse Traction Brake Company.

Discussion led by J. S. McWhirter, superintendent of equipment Third Avenue Railway, and Hugh Savage, superintendent of equipment Brooklyn City Railroad.

The annual dinner will be held at the Hotel Commodore the same evening, beginning at 6:30 p.m. W. G. Gove, president of the association, will be toastmaster. The speakers will be Roland B. Woodward, general secretary Rochester Chamber of Commerce, and Captain Irving O'Hay, U.S.A. (retired.)

Buffet lunch will be served at noon on the day of the meeting. Those who desire to attend the dinner should make requests for reservations at once to the chairman of the committee, A. L. Hodges, assistant general manager Brooklyn City Railroad, 168 Montague Street, Brooklyn, N. Y.

Maryland Association Announces Meeting

ON MARCH 23, 1928, the Maryland Utilities Association will hold its annual meeting at the Emerson Hotel, Baltimore, Md. The program has not been completed but papers of interest to public utilities will be presented and discussed at the meeting.

Special Sleepers for Southern Equipment Delegates

SPECIAL Pullman sleeping cars will be provided for members of the Electric Railway Association of Equipment Men, Southern Properties, bound for their convention to be held in New Orleans, Jan. 25-27. The cars will be attached to the Piedmont Limited of the Atlanta & West Point Railroad at Atlanta. The train leaves at 4:20 p.m. on Jan. 24 and arrives in New Orleans at 7:20 the next morning.

Officers of International Association

THE full list of officers and executive committee of the International Street and Interurban Railway and Bus Association has been announced. Under the terms of consolidation of the two former European associations, representatives from Central Europe were elected to the governing body. The names of the present officers follow:

President: F. de Lancker, Brussels.

Honorary Vice-President: G. Pavie, Paris.

Vice-Presidents: Ch. Thonet, Brussels; A. Mariage, Paris; Max Drager, Berlin.

Members of executive committee: Ch. Rochat, Geneva; L. Boulle, Paris; L. Caufriez, Brussels; le Marquis de Foronda, Barcelona; Fr. Level, Paris; le Commandeur Salvadori di Wiesenhoff, Turin; le Commandeur Natoli La Mantea, Palermo,; J. W. Van Der Vegt, The Hague; L. Noirfalise, Liége; A. Falkenberg, Lilleaker, Norway; G. Hellgren, Stockholm; Al. Kuhn, Warsaw; L. Graux, Brussels; Wilhelm Stein, Hamburg; O. Lowit, Mannheim; L. Spängler, Wien; St. von Sztrokay, Budapest.

Secretary General: A. de Backer. Brussels, Belgium.

American Association News

Rolling Stock

LAYING out and general discussion of work to be done by various special committees of the Rolling Stock Division for the year constituted the principal business of the general rolling stock committee at its meeting at association headquarters in New York City on Dec. 9. Those present were A. T. Clark, chairman; C. Bethel; W. C. Bolt; J. M. Bosenbury; R. S. Bull; J. A. Brooks; R. W. Cost; M. R. Hanna; A. D. McWhorter and R. B. Smith.

The various assignments to special committees were gone over and discussed. Suggestions were made of things desirable that could be properly taken up by the chairman of the special committees. For special committee No. 1 on the review of the Manual, the branding of hose was discussed and recommended for study in connection with revision. In connection with the work of special committee No. 2 on motor coaches, it was considered desirable to make a study of motor coach lighting. This work, however, was in line with work being done by special committee No. 4, and so this committee will investigate the subject. Another subject considered for investigation by special committee No. 4 was headlights. Opinion was advanced that stronger headlights were desirable for city cars.

On assignments of subjects to last year's committees that were not completed, the work will be taken up at the point left off and an attempt made to complete it as soon as possible.

Louisville, El Paso and Wilmington Win Brady Safety Medals

THREE Anthony N. Brady Memorial medals for outstanding accident prevention and health promotion work on electric railways, for the year ended Dec. 31, 1926, have been awarded to the Louisville Railway, the El Paso Electric Company and the Tide Water Power Company of Wilmington, N. C. The Pittsburgh Railways received honorable mention and was voted a certificate. Announcements of the awards have just been made jointly by the American Museum of Safety and the American Electric Railway Association.

The medal awards for 1926 were made to the three electric railway organizations graded according to receipts, making the best record in accident prevention and health promotion, according to records submitted. One prize is given in the class of companies operating upwards of 5,000,000 vehicle-miles, one for companies between 1,000,000 and 5,000,000, and one for companies with less than 1,000,000 vehicle-miles. The committee's purpose in this, it was announced, was to promote active competition for the awards by every electric railway, however large or small.

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News of the Industry

Patrons in Biddeford Desire Fare Boost and Continuance

An unusual petition signed by residents of West and Granite Streets in the city of Biddeford, Maine, has been presented to the officers of the Biddeford & Saco Railway asking that the present fare of 5 cents be doubled. The petition, signed by about 50 residents, asks that the increase in fare be granted in order that the line may be continued in operation.

When the York Utilities Company abandoned its line between Biddeford and Kennebunk, the Biddeford & Saco Railway continued to run cars over the line from City Square to Proctor Road in North Kennebunkport. Following a short trial period the company found that this operation did not pay, and it was then cut down to a distance of about 2½ miles on a 5-cent fare with a half hour schedule for ten hours daily. But when service could not be maintained under the present fare tariff, the officials discontinued the service, and notice was given that no cars would be run after Jan. 14.

The petition, however, reopened the question and it is understood that the railway officials will take the matter up with the Public Utilities Commission in an effort to work out some new plan. The road is desired for the convenience of employees and other residents.

Increased Fare Asked in Tulsa

The Oklahoma Union Railway, Tulsa, Okla., has applied to the State Corporation Commission to increase fares on its lines in Tulsa. The rate asked is 10 cents for a single fare and 25 cents for three fares sold at one time. The former rate was 7 cents for a single fare and 25 cents for four fares.

The rate asked is higher than that recently granted to the Tulsa Street Railway; the latter company receiving 8 cents for a single fare and 15 cents for two fares.

According to O. M. Sewell, vice-president of the company, the increase is asked in order to put the fares on a parity with those of the bus lines which the company operates through a subsidiary concern, the Union Transportation Company. The bus lines were granted the higher rate more than a year ago.

The application does not ask for increases on the lines out of the city. In asking for the increase the company filed a statement alleging that it has sustained an operating loss of $377,152 since 1923. It claims that even the increase will not entirely overcome this loss as the increased amount to be raised yearly is estimated to be only $30,950.

A reason for asking the increase is that transfers can be issued between the bus lines and the railway. At present the difference in fares on the two forms of transportation makes the issuing of transfers impossible. It is also said that a transfer system would be arranged between the O.U.R. lines and the Tulsa Street Railway if the new rates are granted. Transfers between the two railway lines are in effect, although the Tulsa Street Railway has recently been enjoying a slightly higher fare.

The case has been set for hearing at Oklahoma City on Feb. 14.

New Rochester Line Not Ready for High Speed Operation

After a little more than a month of operation, the $12,000,000 subway at Rochester, N. Y., has been found unfit for high-speed traffic until tracks are reballasted and other faults corrected, at a total cost of at least $50,000.

This disclosure was made after an inspection trip by city and railway officials. It has become a live political issue in Rochester, threatening a split between the new city manager government, which took office on Jan. 1, and the old Republican machine politicians.

It was found that before the subway was ready for the high-speed schedule planned for it this month, with installation of the block signal system completed, much reballasting must be done along the 8-mile stretch of trackage in the abandoned Erie Canal, sharp curves must be eliminated, leaky platform roofs at stations repaired and a general clean-up of the cut made.

Officials of the New York State Railways were emphatic in declaring that under no circumstances should the company be obliged to fix up the road, as it was supposed to be in running order when it was handed over by the city for a three-year trial operation.

The subway was opened for partial operation on Dec. 1, but it was hoped to have it in full swing by Jan. 15, a hope that has gone glimmering with the discovery of the flaws in the line.

Fare Increase in Youngstown With Weekly Pass Restored

A new fare schedule calling for 10 cents cash on both buses and cars, a no transfer charge, six tickets for 50 cents and a weekly pass for $1.50, on the lines of the Youngstown Municipal Railway, Youngstown, Ohio, is to be given an eight weeks' trial. In voting for this increase in fare the City Council set Feb. 5 as the beginning date. The present fare is 8 cents cash, seven tickets for 50 cents with a 1-cent transfer charge. Service improvements are authorized.

Utility Investigation Meets Criticism

Opposition varied by companies, commissioners and bankers to Senator Walsh's resolution. Senator Lenroot issues challenge to Senator Walsh

VIGOROUS opposition to the Walsh resolution — opposition of a character calculated to impress Congress more than any that could be exerted by the utilities themselves—has come from the utilities commissioners of the states, from investment bankers and from representatives of securities owners.

When Senator Watson of Indiana called the interstate commerce committee of the Senate to order on Jan. 16 he said that the committee must consider the advisability, necessity and expense of an investigation into the conduct of public utilities of the far reaching character indicated in the resolution which he read. Thereupon Senator Walsh, made a long statement in justification of a minute inquiry by a special committee of the Senate into virtually every phase of the public utility business. He asserted in the course of his argument that "there is a view entertained by not a few people that the state commissions are not really functioning as they should because these utility corporations are constantly contributing large sums to control elections, and in one way or another they thus control state conventions."

A committee representing the National Association of Railroad and Utilities Commissioners made a special point of Senator Walsh's statement in a report which was submitted to the committee at its subsequent session. The report concludes:

> The commissions declare themselves opposed to invasion by the federal government in any manner of the rights of the sovereign states in the control and the regulation of public utilities. Therefore these commissions are opposed to any action of Congress that might result in an invasion of state rights or the substitution of national for state utility control.

Henry R. Hayes, president of the Investment Bankers Association of America, said:

> The public utility industry is now in a very desirable condition of prosperity. The reason for this is because, as a whole, it is economically sound throughout. It supplies "products" the usefulness of which is constantly growing and virtually universal and unlimited. Through its technical, managerial and financial progress it has consistently effected improvements and expansion to meet, economically and efficiently, the ever-increasing demands of the public. It is ever a pioneer, going continually into new fields, even today bringing electric service to the farmer in a degree not practical a few years ago. It is a vital part of the industrial, the civic and

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the home life of the nation, an integral factor in the country's prosperity, its creation and distribution of new wealth.

The committee on Wednesday heard the argument of former Senator Irvine L. Lenroot, counsel for the Joint Committee of National Utility Associations.

Senator Walsh on Monday read into the record an interview in the Brooklyn *Eagle* with Owen D. Young, chairman of the board of the General Electric Company, in which he stated that the utilities would not oppose an investigation. Mr. Lenroot read a part of that interview in which Mr. Young declared that the utilities would not oppose an investigation by proper authorities when specific charges had been made. Mr. Lenroot insisted that no specific charges had been made against the utility companies and issued a direct challenge to Senator Walsh to show the contrary.

Ten-Cent Fare for Macon

Ten-cent fare for the casual rider with four tickets for 30 cents will go into effect sometime in February, after the Macon Railway & Light Company, Macon, Ga., has finished $314,000 in improvements now being installed in an effort to bring more patronage to the transportation system. L. A. Magraw, general manager of the company, said:

> There is no widely established precedent to indicate that the improved service and equipment will in any way increase the patronage of the system. It is only a hope that this expenditure will provide in Macon a solution of the problem being faced by transportation companies in all of the smaller cities and most of the larger municipalities. This problem has manifested itself during the last eight years through decreased patronage brought about by automobile competition.

The twelve new cars that have been ordered by the company will arrive and be put into service upon completion of the new tracks. Many schedule changes that will have a tendency to offer increased service during the rush hours will be put into effect, it is understood.

Petition for Special Transit Session Approved in Chicago

In the belief that so clear an expression of the desires of citizens of Chicago would virtually force Governor Len Small to call a special legislative session to consider the city's traction enabling bills, the City Council committee on local transportation on Jan. 16 approved a plan to circulate a petition for 100,000 signers urging the Governor to convene the legislature for a second time since the close of the regular term last summer.

Forty thousand petitions, each bearing space for 25 names, are to be sent out immediately by the committee to large industrial plants, clubs, and civic organizations for their aid in obtaining signatures.

The five transit bills representing the city's views have not been put in final form yet, but it was indicated at the councilmen's meeting that they would be ready if the Governor should call a special session.

Lavish Christmas Decoration in New Jersey

Public Service Terminal Building, Newark, N. J., the main office of Public Service Corporation of New Jersey and its various subsidiary companies, was elaborately decorated for the Christmas holidays. Many of the commercial office buildings in various parts of New Jersey also were decorated in keeping with the holiday spirit. Carhouses and garages of the transportation companies had Christmas trees.

Proclaiming Christmas in New Jersey

The entire front of the building on Park Place was trimmed with garlands and lights, from the top to the first floor. The garlands were draped in graceful loops at the eaves and hung in vertical lines of various lengths over the face of the building. Huge wreaths and Christmas trees were placed against the grilled arches between the first and third floors and were electrically lighted. Seven huge lighted red candles were placed on the ledge above the second floor cornice. They ranged in length from 10 to 40 ft.

On the Canal Street side there were wreaths and trees similar to the decorative scheme employed on the arches between the first and third floors on the Park Place front. At the extreme top of the center flagpole a 3-ft. high illuminated star was set and streamers were draped from the pole to the edges of the roof.

Postponement Sought in St. Louis Rate Case

Another postponement of at least three months in the hearing by the Missouri Public Service Commission in the valuation rate case of the St. Louis Public Service Company was requested on Jan. 9 by City Counselor J. T. Muench of St. Louis. The commission took the request under advisement.

The original application for a straight 8-cent fare was filed on June 3, 1926, and the company completed its case last May. At that time the city was granted six months in which to prepare an answer. A temporary increase from 7 cents to 8 cents, or two tokens for 15 cents, was granted by the commission on July 5 last, and will stand until the rate case is completed.

Contracts With Labor Unions Opposed by Detroit Commission

A resolution opposing working agreements with any labor union has been passed by the Detroit Street Railway Commission. This move was prompted by the demand of the business agent of the Detroit branch of the International Brotherhood of Firemen, Oilers, and Railway Laborers that the Detroit Street Railways enter into a working agreement with the members of that union. The agreement proposed, it was reported by the secretary of the commission, was intended to apply only to union members and would require the employment of all union men eight hours a day and six days a week.

It is the sense of the commission "that the unionizing of this or any other governmental agency or department is improper and opposed to public policy." Also "that the regulation of wages and working conditions in such department must rest with the governmental agency established to carry on the particular enterprise; that since this railway is owned by the city of Detroit, it is the property of all citizens of the city, and they all have equal rights in its opportunity for employment." It further states that while membership in a union is not properly an objection to any employee, membership in no organization can be allowed to give any employee special privileges or advantages over other citizens who do not belong to such organization.

Increase in Fares Between Canton and Massillon

The Public Utility Commission has granted the Northern Ohio Power & Light Company, Akron, Ohio, permission to increase its rates between Canton and Massillon as follows:

	Rate, in Cents New	Old
Canton to Massillon	20	15
Canton to Jackson Lane	15	10
Canton to Whipple Road	06	05
Whipple Road to Jackson Lane	10	05
Whipple Road to Massillon	15	10
Jackson Lane to Massillon	08	05

The round trip between Canton and Massillon is to be 30 cents. The former round-trip rate between these two points was 25 cents.

Commuter rates between Canton and Massillon are increased from 50 for $5 to 20 for $2.50.

The action of the commission follows the failure of the Commissioners of Stark County to grant an increase in rates.

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Sunday "Passes" in St. Louis

Permission to sell "passes" over the lines of the St. Louis Public Service Company within the city of St. Louis effective Jan. 15 was authorized by the Missouri Public Service Commission on Jan. 9. City officials raised no objection to the proposal.

The order covers Sundays and holidays. Passes will be sold for 25 cents and will be good from 3 a.m. on date of purchase to 3 a.m. the following day. They will entitle the bearer to unlimited transportation on street cars within the established fare zone in the city limits. The purchaser may turn the pass over to other persons, but only one person may use the pass for the same trip.

Stanley Clarke, vice-president of the St. Louis Public Service Company, told the commission that his company wanted to stimulate the habit of car riding on Sundays and holidays.

The privilege to roam all over the city fare zone of St. Louis on a Sunday for 25 cents met quick appreciation from the public of St. Louis on the opening day, Jan. 15. Although the morning weather was raw and clammy enough to discourage early riding, 20,432 passes were sold. The pass cost equals 3.3 times the token fare of 7½ cents. Most of the sales were made to adults, inasmuch as the fare for children between five and twelve years of age is only 3 cents. Included in the favorable comment in the newspapers was the following piece, on the order of that used by Walt Mason, published in the *Post-Dispatch:*

WE SING THE SUNDAY PASS

The street cars run on Sunday, just the same as through the week, but we have no Sunday rush-hour when the traffic hits a peak. Forgotten then the office, the business that we keep, while some of us go riding and sundry others sleep. The solitary grandeur of the Sunday street car's past; for two bits we can ride about as long as Sundays last. When we weary of the riding and we close our heavy lids, the pass is still transferable to mamma and the kids. So, ho, the Sunday street car pass in merry roundelay; just give the man a quarter and he'll let you ride all day. Sing loud the Sunday street car pass in lilting, swinging ditty; we'll give the man a quarter and we'll ride about the city. Sing, ho, the Sunday street car pass in unrestrained, wild glee, we'll ride around the city till the shining hour of three. But when of riding round the town too suddenly we bore, why not let us view the country, say, for 30 cents or more?

The More You Ride the Cars the Better the Service Will Be

According to *Industrial News* of Lansing, Mich., there is talk of the city employing a transportation engineer to work with the Michigan Electric Railway and the city to study service and see that details of the agreement between the company are carried out in the interests of the citizens of Lansing.

The company now has a working agreement for three years with the city. The debt to the city is being paid at the rate of $2,500 a month. Each month the company must report its condition to the public utilities department including earnings and expenses. As the *News* sees it the question of greatest interest to the public is service. On this matter the commmentator said:

The car-riders have this matter in their own hands. In general the citizens of Lansing themselves determine the service.

The worst kickers on service are those people who ride the cars only when the snow is deep and they cannot drive their own cars, but they expect the street cars to go through without any trouble. When a storm such as was experienced a week ago strikes Lansing the railway works 24 hours a day to keep the tracks clear and the cars running on schedule. The more you ride the cars the better the service will be. Perhaps a transportation man could figure out a better way to give service.

Increase to Ten Cents in Cairo

Fare in Cairo, Ill., is to be raised from 7 cents to 10 cents under a new plan advanced by the Illinois Power & Light Corporation, which owns the city and interurban lines in that city. Under the new plan books of twenty tickets will be sold for $1.25, and a 3-cent fare for school children will continue. Hearing on the new rates was conducted recently before Judge George W. Pillow, assistant commissioner of the Illinois Commerce Commission. A. C. Hall, assistant general manager of the company, cited the automobile as the cause of the decrease in the number of passengers hauled by the street cars. The city lines carried 1,262,000 passengers in 1920 and only 515,000 in 1926.

Decorate Car in Gary for Public Guessing Contest

To arouse greater interest in street car service and as a stimulus to traffic the Gary Railways, Gary, Ind., recently announced a prize contest in which cash awards aggregating $100 would be made for the fifteen answers which most nearly approximate the exact number of passengers carried during the 30 days ended Feb. 12 by a single designated street care operated in the city. One of the company's new 52-passenger one-man, double-truck safety cars has been appropriately decorated for the contest, the sides and front and rear dashes of the car being painted white and labeled with the terms of the contest in bold letters. The car will be operated during the contest period.

The contest is open to everyone except employees and their families. Blank cards are available for "guesses" to be turned in to office.

The entry blanks also provide space for recommendations or suggestions as to how the service may be improved. The entrant need not fill out this space, however, if he does not wish.

The first prize of $35 and fourteen other awards of smaller amounts will be distributed at the close of the contest. Mayor Floyd Williams and other prominent citizens of Gary will act as judges.

Seattle Fund Plan Fails

The two most recent projects planned in the City Council of Seattle, Wash., to provide financial aid for the Seattle Municipal Railway—one for a loan to be made from the light department, and the other for submitting to the voters a proposed ordinance appropriating money from the general fund—have been killed in Council, in committee of the whole. This action also kills any immediate plan to return to the 5-cent fare basis, as proposed by Councilman Oliver T. Erickson, in his bill providing for invading the general tax levy to aid the Seattle Municipal Railway.

Councilman W. T. Campbell's measure provided for a loan of $400,000 from the city light funds to take care of operating expense while the railway is accumulating $1,100,000 to meet bond interest and principal due March 1.

Certain business groups urged the Council to postpone action until the business men's survey of the railway problem now under way is completed, and a comprehensive program for permanent relief recommended.

Meantime, employees of the Municipal Railway numbering about 2,000 received their last pay in interest-bearing warrants, stamped: "Not paid for lack of funds." Payroll checks of $128,329 were cashed by merchants.

A Free Hand for Detroit Department Heads

In the light of the purchase obligations and the rapid expansion of Detroit, the Department of Street Railways, Detroit, Mich., has performed well and creditably. This statement was made part of Mayor Lodge's first communication to the Common Council in which he mentioned various departments of city government. He further stated that the Street Railway Department was top heavy in several divisions with an excess of employees but that a notable start had already been made toward weeding out duplication of effort.

Service, not profit, in the Mayor's opinion, should guide the department's management in every operation and the better handling of "the thousands who daily use the street cars and buses, should be studied closely and their requirements met as quickly as possible."

He said that in co-operation with the Rapid Transit Commission, whose studies of future traffic and transportation needs must continue, and in conjunction with all other city departments having to do with Detroit's streets and highways, the Street Railway Department was to lead in the solution of present transit problems.

In his communication he pointed out that during the coming administration the head of each department would conduct its business without interference either from him or any person, official or unofficial, but that he would consult with the department heads from time to time.

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Relief Plan for Susquehanna Trail Proposed

One track at least of the Valley Railways in Lemoyne, Pa., is on the public highway according to J. L. Shelley, Jr., the state highway department expert on contracts. The highway department has presented a plan for permanent relief of traffic congestion at the "bottleneck" which includes paving, removal of overhead bridge pillars and street car track relocation all the way from the river to Rossmoyne Street, Lemoyne, where the road to York joins Carlisle pike.

Four estimates on the cost of the project designed to relieve permanently the traffic congestion existing in what is termed "bottleneck" from the western end of the river bridges to Rossmoyne Street, Lemoyne, were prepared by P. M. Tebbs, an engineer for the State Highway Department. They vary from $106,504 to $168,299.

The undertaking involves under one of the plans, a new bridge carrying the low grade-line of the Pennsylvania at the entrance to the river bridge. It provides that the tracks be moved to the middle of the highway, with the necessary switches and connections with the carhouse and with the highway constructed of concrete forty feet wide.

This, an important section of highway, carries all the traffic of the Susquehanna Trail, plus the great volume that flows up and down the Cumberland Valley, the Gettysburg traffic and all this on top of the rapidly increasing local traffic between a city of Harrisburg's size and its populous suburbs on the west shore.

Trade of Unprofitable Detroit Lines to State Suggested

Fred W. Green, Governor of Michigan, has suggested to attorneys for the Detroit United Railway that rights-of-way of unprofitable lines be traded to the state for use for trunk-line highway purposes in return for all or part of the back taxes in excess of $800,000 due the state.

The report from Lansing, the state capital, cited that four of the lines of the Detroit United have paid no taxes since 1921 until this year, when payment of about $150,000 was made upon threat from the state to force a sale of some of the properties.

Schenectady Petition Must Be Heard

A motion made by the city of Schenectady, N. Y., for a dismissal of the petition of the Schenectady Railway to increase its fare to 10 cents cash has been denied by the Public Service Commission. Resumption of hearings before the commission on Feb. 1 was further ordered.

The city contended that certain franchises granted the company limit the rate of fare within the city to 5 cents and that the commission had no power to fix a fare in excess of 5 cents without a waiver of those restrictions by the city. But the commission held among other things that under the railroad law of the state the Legislature and the commission had the power to regulate fares on all lines operated under franchises which required compliance with the railroad law, and further it held to the opinion of the Court of Appeals in the Troy and Binghamton railway fare applications that earlier franchise conditions restricting rates of fare were waived by the granting of later franchises containing provisions on complying with the railroad law.

Prosperous Year for Salt Lake City Employees

A surplus of $9,919 has been divided among the members of the Traction and Power Mutual Aid Association composed of employees of the Utah Light & Traction Company and the Utah Power & Light Company, Salt Lake City, Utah. Nine hundred and fifty-nine members participated in the distribution.

Good Cheer Converted Into Good Will in Little Rock

During the Christmas holidays of 1927 the Arkansas Power & Light Company, Little Rock, Ark., placed a selective group of transportation, sales and service men at strategic points in the downtown area of the Arkansas capital. Regular uniformed men from the railway department were assigned to the task of assisting the Christmas shoppers in boarding the street cars in the more congested districts. While these men were equipped to sell tokens and make change their principal job was to carry bundles, assist aged and infirm persons and those with children. The duties were summed up under the blanket order, "Render any service feasible for the convenience of the street car patron."

The "Service Men" was an outgrowth of a "Service Boy" scheme worked out by the Arkansas Power & Light Company last November when the Arkansas Education Association held its annual convention at Little Rock. At that time 25 boys from the Little Rock Boys' Club were employed to act as guides, or pages for the visiting teachers. These "Service Boys" were stationed at the railway stations and important downtown intersections for the purpose of directing the visitors, carrying baggage or rendering any other service practicable for the convenience and pleasure of the delegates. So popular was this service that the company decided to extend the plan during the pre-Christmas season and started a more substantial service to the home people. With this in mind, men rather than boys were selected for the task.

A vast amount of good will resulted to the company in both cases. Local newspapers carried stories and printed pictures of the "Service Boys" and the "Service Men."

Is Poverty an Adequate Defense Against Reconstruction Work?

The Nebraska Supreme Court has been asked by the Nebraska Railway Commission to support it in its controversy with the Omaha & Southern Interurban Railway, Omaha, Neb., that the financial condition of the railway is not a sufficient defense for its refusal to obey an order that it reconstruct a bridge over its rails in Sarpy County, so that a highway may be carried across it. Because of its steep grades the highway had fallen into disuse since the automobile became so generally adopted, and when the bridge became unsafe for use the interurban company declined to rebuild it. The county commissioners filed a complaint and the reconstruction order of the State Railway Commission followed.

On its appeal the company challenges the authority of the commission to make such a condition in its order and also challenges its jurisdiction over railway crossings.

On the question of financial condition the commission states that the plea of prospective bankruptcy following obedience to an order requiring the expenditure of money cannot deprive it of its right to insist that necessary duties devolving upon the utility be performed. It contends that while intelligent self-interest will dictate that a regulatory body do not impose burdens upon the corporation such as will force it to cease service the question rests entirely with the state. It rules that the claim that the utility cannot afford the expense incurred by obeying an order is not available to it as a defense, so long as it has the alternative of withdrawing from business entirely.

Paving Relief Agitation Renewed in New York

Announcement has been made that at a meeting in Albany of the committee named by the Mayors' Conference with the committee named by the electric railways it was voted to request the state tax department to draw a paving relief bill satisfactory to both the cities and the companies.

Harry B. Weatherwax, vice-president of the United Traction Company, Albany, N. Y., member of the special railway committee, and William P. Capes, secretary of the New York State Conference of Mayors, will be the spokesman for the two special bodies. The committee of two will call on the state tax experts this week. When the tax department has prepared its bill, copies will be sent to the railway and cities of the state, with requests for prompt expressions of views.

At the Niagara Falls meeting, the New York Electric Railway Association asked the Mayors' Conference to name a special committee to confer with one from the association "in an endeavor to come to some agreement in this matter (paving between tracks) which will be satisfactory to all concerned."

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Public Utility Course for Business Executives

A six weeks' summer course in public utility management and economics for business executives will be given from July 9 to Aug. 18 by the Harvard University Graduate School of Business Administration, Soldiers Field, Boston, Mass.,' under Philip Cabot, professor of public utility management, and D. W. Malott, instructor in this subject. The course will cover various legal, economic, engineering and financial phases of management and will include a study of court and commission decisions covering valuation, depreciation and fair return, besides cases from company practice in methods of marketing, rate-making, operation, finance, customer relations and the broad economic problems of production. The course will require the full time of the student, classes meeting for four hours daily. The case method will be followed throughout.

A similar course was given last summer with 35 public utility executives from all parts of the country in attendance, and the forthcoming course is the outcome of the success of the former. Miss M. B. Fox is secretary of the special session for business executives.

Lower Fare on Massachusetts Line

A reduction to $1 has been made in the round-trip bus fare between Worcester, Mass., and Webster by the Worcester Consolidated Street Railway. The round-trip fare has been $1.10 on both the Consolidated and the Acme lines. The reduction was made at the request of the Selectmen.

Dining Car Service on Milwaukee-Watertown Line

Dining car service was established on Jan. 16 on the interurban line of the Milwaukee Electric Railway & Light Company between Milwaukee and Watertown. The equipment for this service was built at the company's Cold Spring shops. Every kitchen operation from refrigeration to cooking is done electrically. Table d'hote and à la carte service will be provided on three westbound and three eastbound trips daily except Sunday.

The new dining car service will be tied in directly with the company's Madison buses at Watertown. The train itself is unusual. It is mounted on three special trucks designed for easy riding. The two coaches are joined by a passageway between the passenger and the dining cars. The train is 90 ft. long.

The leading coach is identical in finish with the de luxe coaches now operated on the rapid transit lines. It includes smoker and baggage compartments. The diner seats sixteen persons at a time. The tables are of steel and the chairs of aluminum frame, with spring seats and leather upholstery. The train is so arranged that additional passenger coaches may be attached and operated in multiple if the traffic should warrant.

Institutional Campaign Launched by American Water Works

A six months' institutional advertising campaign in magazines has been started by the American Water Works & Electric Company, controlling company of the Monongahela West Penn Public Service Company of West Virginia. The purpose of the campaign is to stress the various aspects of the service of subsidiary companies such as impartial rates to all consumers, stability of business and emergency services. It is hoped that the series will appeal to the consumer and the investing public.

$275,000 Pledged for San Francisco Line

A resolution pledging $275,000 for the completion of work on the Judah Street line of the Municipal Railway of San Francisco, Cal., has been adopted by the Board of Supervisors. The money will be included in the next budget of the board to pay for the construction if the city is enjoined from paying for the contracts out of the Municipal Railway funds. According to a press report the question now is: What will happen to the suit brought by "A Taxpayer" to prevent the use of Municipal Railway funds for Municipal Railway construction?

Judge Murasky in the Superior Court has already ruled in favor of the city's right to use Municipal Railway funds for Municipal Railway construction, and the city attorney is confident that this ruling will be sustained by the State Supreme Court.

Proposed Increased Wage Scale in St. Louis

Wage increases ranging from 5 to 10 cents an hour have been tentatively decided upon by the 4,500 union employees of the St. Louis Public Service Company, St. Louis, Mo., and will be presented shortly in the form of a proposed new wage scale and working agreement to company officials. A tentative draft of the new schedule met with the approval of the majority at a meeting of the car men held on Jan. 9.

The present wage scale of motorman and conductors ranges from 50 to 67 cents an hour. These workers would receive a raise of 5 cents an hour if the tentative scale is finally adopted. About 3,500 motormen and conductors are employed by the company. Including other workers, such as shopmen, mechanics and maintenance men, there are 50 classifications and each has a different wage scale.

Baltimore Studies Chicago Parking Law

The United Railways & Electric Company, Baltimore, has sent Dean J. Locke, assistant superintendent of the traffic department, to Chicago to make a study of the results of the new ordinance which prohibits parking in the Loop district. The situation in Chicago is said to be similar to that which exists in Baltimore and which the United is trying to improve. Mr. Locke also will study traffic conditions in other cities, including Pittsburgh, Cleveland and Detroit.

Utility Scholarships Announced by University of Illinois

Graduate scholarships and fellowships in the Economics of Public Utilities for the year 1928-1929 have been announced by the University of Illinois. They will consist of three fellowships of $800 each to third-year graduate students; five fellowships of $600 each to second-year graduate students and seven scholarships of $400 each to first-year graduate students. Eligible students must possess a bachelor's degree from a Class A college or university, must have demonstrated excellence in scholarship, and a proper foundation in economics. No application will be received after March 1. Awards will be announced on April 1, 1928. Further information can be obtained from Dean Charles M. Thompson, College of Commerce and Business Administration, University of Illinois, Urbana, Ill.

Bread and Street Car Tickets in Atlanta

Arrangements have been made by the Southern Grocery Stores, Inc., operators of the Rogers chain stores, whereby two wrappers from the popular loaf of bread, accompanied by a nickel, entitles the holder to a street car ticket good on the lines of the Georgia Power Company, Atlanta. Four wrappers and 10 cents will buy two tickets, and so on with the same ratio. It is stated by officers of the company that they have bought at the regular rate of 7½ cents each a large quantity of tickets and have distributed them to the various stores in and around Atlanta. The offer will continue indefinitely, it was stated.

Edward Dana Honored

At the annual meeting of the directors of the Massachusetts Safety Council, held during the week of Jan. 7, Edward Dana, general manager of the Boston Elevated Railway, Boston, Mass., was elected to the presidency. He succeeds Howard Coonley, retired after six years of service. Mr. Coonley remains on the board, and retains his full interest in the work of the council. His successor has served as vice-president of the organization.

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Beeler Report Discussed in Cincinnati

The Public Utilities Committee of the City Council of Cincinnati, which consists of Tylor Field, chairman; C. O. Rose and Fred Schneller, met recently to consider a motion presented by Stanley Matthews, Vice-Mayor, and referred to the committee. As a result a motion was prepared which will be submitted to the Council and if passed will open the way for negotiations immediately with the Cincinnati Street Railway for the operation of the rapid transit system.

The new motion was prepared mainly because the committee had before it another motion presented by Mayor Seasongood several weeks ago, calling upon the City Manager to investigate and report on the Beeler report, and it was thought desirable to combine the two. The motion as prepared is as follows:

That the Public Utilities Committee be directed to confer with the Rapid Transit Commissioners, the Cincinnati Street Railway and the committees of semi-public bodies in regard to the Beeler report on the rapid transit system, and to report in three months the progress made, and that the City Manager is directed to assist the committee.

Mayor Seasongood contends that a subway in a city of less than 1,000,000 inhabitants will not be a paying proposition and also objects to the completion of the system on the ground that it will in fact benefit outlying municipalities to a greater extent than it will Cincinnati but with Cincinnati paying the entire cost.

Other Councilmen, chiefly Mr. Matthews and Mr. Rose, say that it is too late to bring up the objection of benefiting outlying communities. They contend that more than $6,000,000 has already been spent and that it is only logical under the circumstances to proceed and finish the job.

Unusual Strike in Pennsylvania

Emergency bus operations in the territory of Pottsville, Pa., and its vicinity has been in force since Jan. 6 when employees of the East Penn Electric Company walked out as the result of the inability of the company and the men to agree on the inclusion of the word "subsidiary" in the new contract.

When the agreement with the union expired on Dec. 31, 1927, a similar contract was offered to the men without any change. It was agreed to by them with the exception that they demanded the word "subsidiary" be placed in the preamble of the contract, and a bus clause embodied in the contract which would cover any future bus operation. It is said by some that the men have the idea that the railway proposes to abandon some of the lines and replace the service with bus operation. This viewpoint has been termed erroneous by company officials who have tried to make it clear to the men. They in turn insist on a bus clause and the word "subsidiary" being inserted in the preamble.

Meanwhile the Pennsylvania Public Service Commission through its representative, Harvey Rose, has placed buses throughout the territory with men in charge who are holders of certificates in different localities in and about Schulykill County. The public, apparently unaffected by the strike, is riding the buses and from all reports is much in favor of the company's refusal to enter into any such contract with the men.

Parking in St. Louis Under Scrutiny

An ordinance to eliminate daytime parking except for commercial vehicles in the downtown section of St. Louis, Mo., has been prepared by Director of Streets and Sewers Brooks. The bill will also provide more drastic regulatory parking measures for a larger district surrounding the downtown congested sections.

Foreign News

Bus and Tramway Co-ordination in Scotland

Greenock and Port Glasgow Tramway, Glasgow, Scotland, has withdrawn its tramway services on Sundays and after 9 p.m. on weekdays. The company operates buses in addition to the tramcars. It is believed that buses alone will be able to handle traffic during the hours when the tramcars are withdrawn.

Sydney Trams Show Passenger Increase

Passenger revenues of the tramway system of Sydney, New South Wales, increased during the year ended June 30, 1927, from £2,900,406 in 1926 to £3,030,973 in 1927. Operating expenses were £2,480,587 in 1926 and £2,627,045 in 1927, giving net earnings in 1926 of £419,819 and in 1927 £403,928. The greater part of the increase in expenses is due to higher wages, combined with the shortening of the hours of duty from 48 to 44 per week. During the past year, the operating cost per car-mile was 23.83d. (47.66 cents). The book investment is £8,110,571, so that the net earnings show a return on the capital of 5.03 per cent.

The number of passenger fares collected during the year numbered 279,671,372, an increase of 6,167,489 over the previous year. The rolling stock was increased by 25 cars. The total number of electric cars on June 30, 1927, was 1,541 motor cars and four trailers. The lines are owned and operated by the New South Wales government, which also owns and operates the trunk line railways in New South Wales and the new subway system in Sydney.

Rapid Rise of Barcelona System—Consolidation Ahead

Barcelona's urban transportation has undergone a radical transformation during the last ten years, according to a report to the Department of Commerce from Trade Commissioner James G. Burke, Barcelona. In 1917, with tram lines alone, the income from fares collected in this Spanish city was only 14,000,000 pesetas. At the present time there exist not only tramways but also two subway systems and a bus company. The total income from these three in 1924 amounted to nearly 35,000,000 pesetas, and the total capital invested is now some 107,400,000 pesetas. This increase has been due to the growth in population and traffic, the movement of the inhabitants from the central part of the city to its outskirts, and increased competition resulting in lowering fares and offering better and more frequent services.

A group of local bankers is carrying on a campaign to combine all subway, tram and bus companies. It is offering the recent combination effected in various European and American cities as an example and is publishing statistics to prove that both better service to the public and municipal economy would be the result.

Tramways Discontinued in Lincoln

Buses will replace tramways in the town of Lincoln, England, because of a continuous falling off in receipts for the last few years, according to a recent announcement. Track construction now necessary would cost £30,000.

Electrification Scheme for Wales

The Swansea & Mumbles Railway, Wales, will soon be electrified at a cost of $750,000, according to a recent report. The British Electric Traction Company is to provide $425,000 of this sum.

The line is at present held by the Swansea Improvements & Tramway Company, a subsidiary of the traction company, and the lease is to be transferred to the South Wales Transport Company, another subsidiary. The main supply of current will be at the Swansea end of the line, but a transformer substation will be constructed at Blackhill. Each of the cars proposed for use on the line will carry 110 persons and cost £4,000 ($20,000). The equipment will be overhead and a 7½-minute service is to be provided.

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Recent Bus Developments

Last Independent Purchased in Akron

The last independent bus company in Akron, Ohio, the Zeno Transportation Company, has been purchased by Northern Ohio Power & Light Company, and the latter company assumed full control on Jan. 9. The line will continue to operate for 30 days under the present name and will remain an independent company for the time being.

The Zeno Company operated in Akron for seven years. It provided service on South, Sumner, Johnston, Inman and McGraw Streets and operated special buses morning and evening to and from the Goodrich and the Goodyear plants.

Following approval of the City Council, the line will be made a part of the transportation system in Akron with the issuance of transfers between this line and other lines.

The Zenos' had eleven buses, a garage and a filling station. The railway takes over all of this property.

Railway and Bus Men in Oklahoma Co-operate

The Oklahoma Railway, Oklahoma City, Okla., has submitted a proposal to state bus operators for issuance of through tickets on combined interurban, electric and independent bus lines.

P.R.T. Plans More Purchases —Further Ban on Cruising

The Philadelphia Rapid Transit Company, Philadelphia, Pa., applied to the Public Service Commission Jan. 19 for the purchase of the Quaker Cab Company, the only large operator of taxicabs in the city which is not under the control of Mitten Management, Inc. This move follows an announcement made on Jan. 6 by Ralph T. Senter, president of the company, in a letter to Mayor Mackey outlining the policy for 1928. He said that the purchase would make possible the standardization of all taxicab rates in Philadelphia and eliminate duplicate service.

It also sought authorization for acquiring the Montgomery Bus Company, the Doylestown-Easton Motor Company and the Philadelphia Suburban Transit Company. The company's program was defined as contemplating "more unified and efficient transit service in Philadelphia's suburbs."

In connection with cab cruising, night as well as day restrictions to taxi stands was ordered on Jan. 8 by Superintendent of Police Mills of Philadelphia, Pa. The "no cruising" edict against taxicabs was designed to reduce still further the number of empty cabs in the congested section and to increase the service rendered by taxicab companies to the public. It is a revision of the former taxicab rule, as a result of an intensive investigation of traffic congestion made by the Department of Public Safety.

In the area from Walnut to Arch Streets and the Delaware River to Eighteenth Street inclusive, cabs will be permitted to move from one stand to another as traffic demands, except from 8 a.m. to 6 p.m. when empty cabs will not be permitted to pass an empty stand without orders from a dispatcher or supervisor. The former edict on taxicab cruising in Philadelphia was referred to previously in ELECTRIC RAILWAY JOURNAL.

New Bus Service Installed in Kansas City

A system of part-time bus service on East 43d Street was recently installed by the Kansas City Public Service Company, following a meeting of Fred Buffe, vice-president of the company, and the members of the Southeast Improvement Association, which has repeatedly petitioned the company for bus service at this point. An agreement calls for bus service on week days from 6 a.m. to 9:30 a.m. and from 4 p.m. until 7:30 p.m. Saturday night and Sunday night service also will be arranged, Mr. Buffe announced. Officials of the company estimate that 95 per cent of the patrons of the district will be accommodated by the new arrangement. The buses operate at fifteen-minute intervals.

Richmond-Seven Pines Line Denied Permit

Application of the Sandston Railway for authority to operate bus service between Richmond and Seven Pines, Va., via Williamsburg Road, has been dismissed by the Virginia Corporation Commission "without prejudice" by request of the petitioner. Opposition was voiced by the Virginia Electric & Power Company and the Peninsula Transit Corporation. A similar petition was filed by the Sandston Railway about a year ago, but was finally withdrawn.

Regulation for Interstate Carriers

Examiner Flynn presents report on I. C. C. inquiry. The findings and conclusions of his report, however, are merely tentative. Exceptions must be recorded by Feb. 7

FEDERAL regulation of all common carrier motor vehicles operating in interstate or foreign commerce over the public highways was recommended on Jan. 16 by Leo J. Flynn, attorney-examiner for the Interstate Commerce Commission, in a report to the commission based upon an investigation of bus and truck operation throughout the country.

The report covers every phase of motor transportation. It will be argued before the commission on Feb. 10. It recommends that all steam and electric lines now subject to the Interstate Commerce act be authorized by law to engage in motor vehicle service, directly or through subsidiaries, upon obtaining a certificate of convenience and necessity; also that independent motor companies operating in interstate commerce be subject to regulation. Mr. Flynn held that so-called contract carriers "are not sufficiently standardized to make the regulation of such operations in interstate commerce advisable at this time."

The regulation proposed in the report, however, would not include motor vehicles operated by the owners incidentally to the conduct of their business.

It is believed that the record warrants the following conclusions:

1. Transportation of passengers and property by motor vehicles operating over the public highways is a well-established, useful and permanent factor in the nation's transportation system.

2. Steam railroads and electric railways are engaging more and more extensively, either directly or through subsidiaries, in motor vehicle transportation as supplementary to their rail operations to replace train operations, or as feeders or distributing agencies.

3. Carriers now subject to the act should be authorized by law to engage in motor vehicle service over the public highways, directly or through subsidiaries, upon obtaining a certificate of convenience and necessity as provided in such law.

4. The revenues, expenses, and investments and other statistics incident to motor vehicle operations by carriers now subject to the act, either directly or through subsidiaries, should be required to be regularly reported to the Commission and be declared by law as coming within the provisions of section 15a of the interstate commerce act in determining net railway operating income under the provisions of that act.

5. A more detailed classification of accounts adapted to the peculiar problems arising from motor carrier operations by carriers subject to the interstate commerce act, directly or through subsidiaries, should be adopted.

6. Carriers subject to the interstate commerce act and their motor carrier operations should be authorized by law to participate in joint rates and through routes with common carrier motor bus and motor truck lines holding certificates of convenience and necessity from some regulatory body in substantially the same manner as they are now authorized to do with carriers now subject to the act.

7. The problem of regulating motor vehicle operations in interstate commerce is a comparatively new one, and it is too early to attempt regulation by a rigid law. It seems wise, however, to lay down a few

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principles governing such operations at this time.

8. The law should provide for the regulation of interstate commerce by motor vehicles operated as common carriers of passengers and property over public highways.

9. Regulation should not include motor vehicles operated by the owners incidentally to the conduct of their business.

10. The motor vehicle operations of so-called "contract carriers" are not sufficiently standardized to make the regulation of such operations in interstate commerce advisable at this time.

11. Motor carriers operating in interstate commerce as common carriers should be classified: (1) Those operating between fixed termini or over a regular route; (2) all other common carriers.

12. Original jurisdiction in the administration of regulation over motor vehicles operating in interstate or foreign commerce as common carriers over the public highways should be vested in such state regulatory bodies as notify the Interstate Commerce Commission that they will act. The Interstate Commerce Commission should be delegated to act with original jurisdiction whenever a State board fails to notify the commission of its acceptance of the delegation of authority to act under the federal statute, and until such notice is received. Joint boards composed of two or more state boards, or representatives of such State boards and of the Interstate Commerce Commission, when acting for a state board, should be authorized to act where the commerce is carried on in two or more states.

Right of Appeal Reserved

13. The right of any party to appeal from the action of a state board or a joint board to the Interstate Commerce Commission should be preserved.

14. Legislation for the regulation of motor vehicles operating as common carriers over the public highways should provide as prerequisites to operation: (1) Certificate of convenience and necessity; (2) liability insurance or indemnity bond or satisfactory assurance of financial responsibility which will insure adequate protection for the responsibility assumed in the transportation of passengers or property.

15. The law should provide that in determining whether or not public convenience and necessity require the granting of a certificate to operate, reasonable consideration, among other pertinent matters, should be given to available transportation service by any other existing transportation agency operating in the same territory, and to the effect which the proposed service may have upon any such existing transportation agency, the continued operation of which is important to the community served by it.

16. The law should provide that the fact that an applicant for a certificate of convenience and necessity was in bona fide operation on March 2, 1925, and continuously since then and at the time application is made shall be considered prima facie evidence as to the convenience and necessity of such operation.

17. Transfer of certificate of convenience and necessity should be permitted with the approval of the issuing board. Revocation of a certificate should only be permitted under circumstances of compelling public necessity.

18. As a condition to the exercise of rights granted with a certificate of convenience and necessity, the holder of the same should be required to undertake to furnish such additional service as the needs of the public might demand in the future.

19. The law should require that rates be just, reasonable, not unjustly discriminatory, and not unduly preferential or unduly prejudicial.

20. Provision should be made for the filing of complaints against rates, practices, or service of motor vehicles operating in interstate commerce over the public highways. The procedure upon hearing of such complaints should be substantially the same as the procedure at hearings upon complaints against steam railroads or electric railways.

Wide Discretion Urged for Regulatory Boards

21. The regulatory boards should be vested with wide discretion in the administration of the law, particularly with respect to rates, fares, and charges, accounting and filing reports; and in the making of rules and regulations for the regulation of motor vehicle operations and service.

22. Broad discretionary powers should be given to the regulatory boards in the matter of exempting interstate motor vehicle operations from any of the provisions of the law if such exemption would be in the public interest, as in the case of small operators who are giving transportation service important to the communities served, but who might be unable to continue operations if required to comply with all regulatory provisions on account of the additional expense involved.

23. Brokerage in transportation of passengers for hire in interstate commerce by motor vehicles operated by a person or company not holding a certificate of convenience and necessity from a regulatory body covering such service should be prohibited.

24. The issuance, interchange, or exchange of free passes and free transportation by common carrier, motor carriers operating over the public highways in interstate commerce should be prohibited, except in substantially the same manner and to the same extent as provided for in the case of common carriers now subject to the interstate commerce act.

25. Federal legislation for the regulation of commerce by motor vehicles should include the transportation of passengers or property to or from a foreign country, but only so far as such transportation takes place within the United States, in substantially the same manner and to the same extent as interstate commerce.

26. The transportation of explosives and inflammables by motor vehicles in interstate or foreign commerce is prohibited by the transportation of explosives act, except and in the manner provided therein.

27. The provisions of the bills of lading act are applicable to motor carriers operating in interstate or foreign commerce.

28. The provisions of the Clayton anti-trust act relating to the business and transactions of common carriers are applicable to the business and transactions of motor carriers operating as common carriers in interstate or foreign commerce.

29. Public policy demands the fostering and preserving in full vigor motor vehicle transportation as well as rail and water transportation. Section 500 of transportation act, 1920, should be amended to include motor vehicle transportation in the declaration of policy there made.

There should be a wise, farsighted, and definite co-ordination of all existing transportation agencies—land, water, and air.

The report is a document of 105 mimeographed sheets.

The commission's authority for making the investigation is based upon provisions of the interstate commerce act: (1) The commission has authority to investigate the manner in which common carriers subject to its jurisdiction are doing business, and (2) the commission is authorized, and in fact is directed, to make such recommendations annually to Congress on matters pertaining to the regulation of interstate commerce as it may deem necessary.

Reasons for the Investigation

Prior to March 2, 1926, state regulatory bodies generally had assumed, in the absence of any federal legislation on the subject, regulatory control over the operations of motor buses and motor trucks engaged in interstate commerce and interstate operators were required to conform to the laws and regulations of the states in or through which they operated. On that date the Supreme Court of the United States handed down decisions holding that state regulatory bodies could not restrict the operation of buses or trucks engaged in interstate commerce where such regulation was not primarily with a view to safety or to conservation of highways. Buck vs. Kuykendall, 267 U. S. 307; Bush Co. vs. Maloy, 267 U. S. 317. No regulation has been exercised over interstate commerce by buses or trucks not used in terminal service in connection with rail transportation since these decisions were rendered. Several bills providing for the regulation of interstate commerce by buses and trucks operating as common carriers on public highways were introduced at the 69th session of Congress.

Steam railroads and electric railways had entered into the field of motor transportation either directly or through subsidiaries as supplementary to their rail operations; a number of railroads had filed applications with the commission for permission to abandon portions of their lines, alleging as one of the reasons, loss of passenger or freight revenues by reason of motor bus or motor truck competition. The legality and propriety of arrangements under which motor buses or trucks are operated by, or in connection with carriers subject to the interstate commerce act had arisen in formal cases before the Commission and otherwise. Informal complaints had been received from passengers who had engaged transportation for interstate travel by motor vehicle from irresponsible operators who failed to carry out their contracts.

Considering these matters, as well as the rapidly increasing importance of motor transport, the commission on June 15, 1926, entered upon an investigation on its own motion into and concerning the general question of the operation of buses and trucks by, or in connection or competition with, common carriers subject to the interstate commerce act. The scope of the investigation included the legality and propriety of the arrangements under which motor buses and trucks are operated by, or in connection or in competition with carriers subject to the act; the rates, fares, and charges for such services, and the provisions for filing schedules thereof

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and the extent to which the traffic and the revenues of the carriers subject to the act are affected by the operation of buses and trucks.

Some Facts About the Electric Railways

Of 260 electric railways subject to the interstate commerce act 118 reported in response to the questionnaire. They operated 401 buses in terminal service and 351 buses in line service with a total bus route mileage in line service of 2,972 miles. Through subsidiaries they operated 190 buses in terminal service and 422 buses in line service over a total line bus route mileage of 2,857 miles. The electric carriers reported that 78 buses were operated by others than themselves or their subsidiaries in terminal service and 315 were operated by others in line service over a bus route mileage of 1,816 miles. With respect to motor buses operated by others in competition with their rail service the electric carriers reported 1,215 vehicles so operated with a total line bus route mileage of 10,280 miles.

The replies of the electric railways indicate that the majority of the buses operated by them or by their subsidiaries were engaged in line or terminal service in competition with their own operations.

The electric railways reporting operate eight motor trucks in line service over a truck route mileage of 192 miles and 22 trucks in terminal service. In connection with these railways 65 motor trucks were operated by others in line service over a truck route mileage of 829 miles and 27 trucks in terminal service. There were 2,329 motor trucks operated by others in competition over a route mileage of 18,795 miles.

Fewer Electric Railways Report to Commission

In 1921 the number of electric railways reporting to the commission was 312. The number decreased each year until in 1926 it was 259. During the same period the railway operating revenues of the electric railways reporting to the commission decreased from $235,656,072 to $194,860,000, or 17.31 per cent, and railway operating expenses decreased from $189,450,749 to $163,210,222, or 13.85 per cent. The passenger revenue decreased from $193,166,389 to $140,536,857, or 27.25 per cent. It is interesting to note, however, that there was a steady increase in freight revenue during the same period. It was $28,585,712 in 1921 and $39,794,714 in 1926, an increase of 39.21 per cent.

The total revenue passengers decreased from 2,099,721,398 in 1921 to 1,351,235,957 in 1926, or 35.6 per cent; passenger car-miles decreased from 443,013,948 to 373,857,483, or 15.61 per cent.

A number of large electric systems which reported to the commission in 1921 were relieved from doing so in 1926 because of the insignificant amount of their interstate business. On the other hand, a number of large systems which filed no reports in 1921 did file reports in 1926.

Financial *and* Corporate

Interest to Be Paid by Chicago City Railway

Payment of the semi-annual interest on the first mortgage 5 per cent bonds of the Chicago City Railway and of the Calumet & South Chicago Railway, the south side operating organizations of the Chicago Surface Lines, will be made when it falls due on Feb. 1, according to Frank O. Wetmore, chairman of the bondholders' protective committee. It is expected that semi-annual interest on the first mortgage bonds of the Chicago Railways Company, which operates the north and west side street car lines under a federal receivership, will be ordered paid on Feb. 1 by Judge James H. Wilkerson in the United States District Court, following similar action taken by the court six months ago.

Revaluation Question Up in Tacoma

At the request of the City Council of Tacoma, Wash., Manager Richard T. Sullivan of the Tacoma Railway & Power Company will sound out the stockholders and bondholders of his company on whether they would agree to requesting a revaluation by the state public works department of the company's properties at $3,000,000, for rate-making purposes, with the understanding that the new valuation would be a consideration for the drafting of a new franchise. The agreement was reached at a recent session with the City Council. This request of the Council means that no attempt will be made to submit a new franchise to the voters at the coming city election, as there is no possibility of the negotiations getting anywhere near finality for weeks or months.

The figure of $3,000,000 as a valuation of the properties of the railway, and of the Pacific Traction Company, is an arbitrary one, to represent roughly what the report of Kenneth G. Harlan indicated would be a reasonable valuation of properties as they stand today. Mayor Tennant made the motion to request the company to determine the acceptability of such a figure.

The value now recognized by the state department of public works for rate-making is in excess of $6,700,000, so that the proposed figure is a huge reduction. Manager Sullivan protested that it would put him in an embarrassing position to go to his people with a request for a valuation less than the $3,500,000 Mr. Harlan suggested as a basis for city purchase. Mr. Harlan replied that his figure had been taken merely as a basis upon which computations might be made, after reducing the company's annual operating expenses by $300,000, hence in the present inquiry, the $3,500,000 figure did not apply.

Mayor Melvin G. Tennant took the lead in directing the negotiations towards determining a new valuation. His stand was that, while the agreement between the company and city for an experimental period of operations had avoided the valuation question, when it came to submitting a new franchise, the people would want to know where the valuation matter stood, and that the state was not in a position at any minute to upset the terms of the franchise on the basis of the $6,700,000 valuation.

New Jersey Board Approves Transfer of Stock

The Board of Public Utility Commissioners of New Jersey on Jan. 14 approved the transfer of all outstanding capital stock of the South Orange & Maplewood Traction Company to the Public Service Corporation of New Jersey. In July, 1901, the South Orange & Maplewood Traction Company absorbed the South Orange & Maplewood Street Railway. The property is leased in perpetuity from Oct. 1, 1903, to the North Jersey Street Railway, now included in the system of the Public Service Railway.

Port Arthur Property Bought by Eastern Texas

At the public auction of the Port Arthur Traction Company, Port Arthur, Tex., the property was purchased by the Eastern Texas Electric Company for $150,000. The sale was ordered by the United States District Court to satisfy creditors holding $324,000 in mortgage notes against the company. The creditors petitioned for the sale through the Dayton Trust & Savings Company, Dayton, Ohio.

J. G. Holtzclaw, general manager of the Eastern Texas Electric Company, announced that it is the plan of his firm to replace the rolling stock on the Port Arthur lines with new cars and to replace much old trackage with new rails. The Eastern Texas Electric Company operates the railway of Beaumont and the Beaumont-Port Arthur interurban line.

Erie Said to Be After Niagara High-Speed Line

Negotiations are reported to be under way for the sale of the Buffalo-Niagara Falls high-speed and the Buffalo, Lockport and Olcott interurban divisions of the International Railway, Buffalo, to the Erie Railroad. The Buffalo-Niagara Falls electric line would give the Erie Railroad a double-track system into

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Niagara Falls with property along the right-of-way sufficient for adding two more tracks. The Lockport and Olcott interurban division is said to be wanted by the Erie Railroad for the access it would give to the Niagara County fruit belt.

The Buffalo-Niagara Falls high-speed line is one of the most highly developed electric interurban systems in the country. The route covers a distance of 23 miles. The right-of-way from the Buffalo city line is a 66-ft. strip.

Receivers of Oklahoma Railway Discharged

The receivership of the Oklahoma Railway, Oklahoma City, Okla., was officially ended on Jan. 5 by an order issued by John H. Cotteral, federal district judge. The report of George A. Henshaw and G. T. Lackey, receivers, was accepted without protest. The final act was the issuance of an order discharging them and releasing them from bonds.

$2,578,296 Budget Submitted in Kansas City

Dr. P. H. Saunders of Newman, Saunders & Company, fiscal advisers to the Kansas City Public Service Company, arrived in Kansas City recently to become a member of the budget committee of the railway. Dr. Saunders came from New Orleans.

The budget of $2,578,296 for the completion of the rehabilitation program of 1928 was submitted to Dr. Saunders and his associate members, Powell C. Groner, president of the company, and Col. E. M. Stayton, city representative.

The budget includes $1,018,180 for overhauling and rebuilding street cars, $933,228 for new tracks and $240,58S for special track work at intersections. The committee will report to the directors of the company at a meeting to be held within a few days.

The franchise promised a rehabilitation program of $6,600,000 to be finished within three years. The expenditures last year were on a scale of more than $3,000,000.

Bad Year for Detroit Municipal Railway

Gross revenues fell off $2,000,000 due to industrial depression. Figures of consulting auditor vary $1,312,858 from city statement. Charges to capital differ

FOR the fiscal year ended June 30, 1927, the gross revenues of the Detroit Municipal Railway, Detroit, Mich., fell off more than $2,000,000. Such is the condition revealed in the annual audit released on Jan. 8 by Price, Waterhouse & Company.

The audit differs from some features of the bookkeeping of the Department of Street Railways, but points out that the net revenue derived from operation during the past fiscal year totaled $1,912,898. Due to the dissimilarity of methods used in compiling the audit, there is a difference of $1,312,858 between the figures presented by the auditing firm and those announced by William M. Hauser, auditor for the Department of Street Railways.

Due to unemployment in the early part of 1927, there was a falling off in the number of passengers using the cars and buses. This falling off was greater during the period following July 1, and is not reflected in the audit completed by the independent firm. The audit suggests numerous changes in the methods by Mr. Hauser in keeping D.S.R. accounts, and as his method differs materially from that followed by the auditing company, the figures of the two audits fail to agree in any but a few particulars.

While the net earnings of the system are listed at $1,912,898, the audit contends that the sinking fund requirements for the year reached $2,600,227. This latter figure exceeds the earnings by $687,329, which is compared with a deficiency of $274,656 for the preceding fiscal year. Mr. Hauser's report shows net earnings as in excess of $3,000,000, which would leave an excellent surplus after sinking fund charges had been met.

The discrepancy between the two figures relates largely to depreciation charges, and the question of what is a capital asset. Investments made by the system as capital investments are considered by Price, Waterhouse & Company as properly chargeable to operation expenses. In other instances the depreciation allowed for buses and street cars is not considered sufficient.

In view of conditions in the city during the past year, Del A. Smith, general manager of the system, believes that the department emerged in excellent condition. The independent auditors' report does not take into consideration more than $500,000 obtained from sale of property in Highland Park, and this sum, with other funds, will be sufficient to meet sinking fund charges, Mr. Smith maintains. The report says:

As a result of our examination, and after taking into account certain adjustments to correct the book figures, including a charge of $1,172,924 in respect to depreciation and accruing renewals of the properties exclusive of motor coaches and an additional charge of $113,503, in respect of depreciation of motor coaches, we find that the operations for the year ended June 30, 1927, resulted in net income of $1,912,896, compared with net income for the year ended June 30, 1926, of $2,274,165, a decrease of $361,266.

Sinking fund requirements for the year, viz., $2,600,227, exceeded the net income available therefor by $687,329, as compared with a corresponding deficiency for the year ended June 30, 1926, of $274,656. No appropriation was made from net income for the year ended June 30, 1927, to provide for future repairs and renewals corresponding to the appropriation made from net income for the year ended June 30, 1926, in the amount of $179,283.

The net income for the year ended June 30, 1927, as set forth in the preceding paragraph, viz., $1,912,898, is subject to adjustment, due to the fact a number of items have been charged as capital expenditures which, in our opinion, and in accordance with the accounting regulations promulgated by the Interstate Commerce Commission, should in part at least be charged to operating expenses.

The audit then proceeds to itemize expenditures totaling $879,455 which the public accountants believe should in part be applied to operation costs. The independent auditors say they are not qualified to distinguish these items as representative of renewals, replacements or repairs, but that if so apportioned and charges made to operation rather than to capital expenditures, then the net revenue would be materially reduced. Extraordinary maintenance jobs cost $545,262.

Gross revenue derived from operation of the system during the fiscal year aggregated $24,298,054, from which must be deducted operation expenses of $18,379,659, leaving a net income from operation of $5,918,394. Taxes paid upon the system totaled $747,327. After interest and sinking fund charges, depreciation, etc., have been considered the net revenue total was $1,912,898.

The net revenue claimed by Mr. Hauser in his report was $3,214,183, leaving a difference between the two accounting reports of $1,301,284. This latter figure is accounted for as follows by the Price, Waterhouse & Company auditors; depreciation of road and equipment exclusive of motor coaches not provided for in the accounts of the department, $1,172,924; depreciation on one group of motor coaches not provided for, $110,235. The two figures total $1,312,858, after deducting $11,573 in respect to correction of distribution of income and expenses as between years.

Foreclosure Suit Brought Against Northern Indiana Line

Foreclosure proceedings against the Chicago, South Bend & Northern Indiana Railway were filed on Jan. 8 in the United States District Court at South Bend by the Central Trust Company, New York.

The foreclosure action was brought by the Central Trust Company as trustee for mortgages aggregating $3,000,000, issued to secure the railway's bonds. The company operates electric interurban lines connecting South Bend, Elkhart and Goshen, South Bend, La Porte and Michigan City, and South Bend, Niles and St. Joseph, Mich., in addition to city service in South Bend and Elkhart and co-ordinated bus service over certain parts of the system.

The line has been in the hands of Raymond R. Smith, former vice-president and general manager, as receiver since last fall.

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Personal Items

A. LeRoy Hodges Promoted

Brooklyn City Railroad official made assistant general manager of 230-mile property he has served since 1919

A. LEROY HODGES was appointed assistant general manager of the Brooklyn City Railroad, Brooklyn, N.Y., on Jan. 10. Mr. Hodges has been connected with the Brooklyn City property since the termination of its lease to the Brooklyn Rapid Transit Company in October, 1919, by order of the federal court, at the instance of which the Brooklyn City was returned to its owners for operation.

Along with Clinton E. Morgan, vice-president and general manager of the Brooklyn City Railroad, Roy Hodges, as he is best known, has carried a large part of the load incident to the rehabilitation and restoration of the Brooklyn property, a system of 230 miles of lines with more than 1,300 cars operating in a territory which while it has the inspiration killing designation of borough contains almost as many people as Chicago. The lease of the road had run since 1893, so that in addition to the complications of physical rehabilitation with its program for the modernization of the entire rolling stock there was the separation of the personnel and the severance of activities carried on for years for all the Brooklyn roads as a unit. So literally has the court order been followed that at the present time only certain phases of legal work of the Brooklyn City Railroad and the Brooklyn-Manhattan Transit Corporation, the successor to the Brooklyn Rapid Transit Company under reorganization, are handled jointly.

A. LeRoy Hodges

Now this may seem to have little to do with Mr. Hodges and his career, but that is not the fact. It furnishes the background indicative of the task involved in the separation of the systems, in which he has been a factor from the first. To the part that he has played in the work done in Brooklyn Mr. Hodges brought a wealth of experience both in railway work and in the field of general business. His first railway connection was with the Westchester, Kennett & Wilmington Railway, Kennett Square, Pa., as secretary to the general manager. He left this property in 1908 to enter the employ of the General Electric Company in Schenectady as secretary to the assistant general manager of the switchboard department.

In 1911 Mr. Hodges left Schenectady to become secretary to A. W. McLimont, then vice-president and general manager of the Michigan United Railways, Jackson, Michigan. When this property was leased to the Commonwealth Power, Railway & Light Company in 1912 he was appointed chief clerk to C. E. Morgan, general superintendent of the Michigan Railway, and continued in that capacity, both in Jackson and Grand Rapids, Mich., until he went with the Brooklyn City Railroad in October, 1919.

Mr. Hodges is a director of the Brooklyn City Railroad, is first vice-president of the Metropolitan Section of the American Electric Railway Association, and is a member of the Brooklyn Chamber of Commerce and the Kiwanis Club. Of his many accomplishments in the metropolitan district not the least by any means is the work which he has done in behalf of the local section of the American Association. Many men have contributed to make this body a success, but few if any of them have had a bigger part in this work than he or have worked more wholeheartedly in the section's interest. And all the while that he has contributed so unstintingly of his time and energy to this work Mr. Hodges has of course been engrossed in the exacting tasks which have just culminated in his promotion to the office of assistant general manager at Brooklyn.

JOHN F. SCHMUNK, C.P.A., formerly vice-president Mitten Management, in charge of accounting, announces the reopening of his Philadelphia office at 700 Cunard Building, 220 South Sixteenth Street, for the public practice of accounting. For a number of years Mr. Schmunk was senior accountant of the Pennsylvania Public Service Commission, later in public practice with offices both in Harrisburg and Philadelphia. He has practiced before state commissions in some of the most important valuation and rate cases involving public utilities in the states of Pennsylvania and New York. As a member of the subcommittee on bus accounting of the American Electric Railway Accountants' Association he participated in the preparation of the accounting classification for motor carriers promulgated recently by the Pennsylvania Public Service Commission.

J. C. Desautels Promoted in Montreal

J. C. Desautels has been appointed chief claims agent of the Montreal Tramways, Montreal, Que., Canada, effective Jan. 1, 1928. He would appear to be the right man in the right place in the light of his experience in this particular field. Early in his career he served as investigator in the claims department at Montreal and in February, 1926, was promoted to the position of assistant claims agent. During June, 1927, he was acting claims agent.

After completing a scientific and business course, the first position he occupied with the then Montreal Street Railway was as stenographer and office clerk, during the latter part of 1901. He was promoted to the position of clerk and dispatcher for the Cote Division in 1902. During that period he started a private four-year course along lines which would benefit him in his new position. A short time later he was transferred to a larger division, St. Henry, and held it until 1910. During that time, in company with another employee he devised and composed the street guide for the use of platform men, which guide is still in use. In June of that year he accepted a position of investigator in the claims department. In October, 1922, Mr. Desautels replaced A. J. Gadoua, the latter having been appointed superintendent.

J. C. Desautels

L. J. Harris Assistant to Treasurer at Atlanta

L. J. Harris will become assistant to the treasurer of the Georgia Power Company, Atlanta, Ga. Mr. Harris has been district office manager in the sales department.

During 25 years of service with the company, Mr. Harris has filled many posts of importance. He started as bookkeeper in the railway department when he joined the company in 1902. In 1906, he was made assistant cashier of the company, which post he retained for six years. His next advancement came when he joined the district sales office in 1917 as field representative for

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the general sales manager. Subsequently he became manager of the same department and remained in that position until his recent promotion to assistant to the treasurer.

Mr. Harris was educated in Atlanta schools and at Georgia School of Technology. Before he became connected with the local railway he was employed by the Fourth National Bank.

Mr. Harris will be succeeded in the position of district office manager of the sales department by J. M. Billing, who was secretary and treasurer of the Athens Railway & Electric Company until that company was acquired by the Georgia Power Company in February, 1927. Since that time he has acted as auditor of district offices and has been associated with the investment department.

Robert P. Woods Heads Clay County Property

Robert P. Woods vice-president and general manager of the Kansas City, Clay County & St. Joseph Railway, Kansas City, Mo., was made president of that line on Jan. 10. He succeeds in this capacity, A. G. Hoyt, New York. Mr. Hoyt will remain with the line as a director. R. S. Mahan, general superintendent, was named vice-president succeeding Mr. Woods. Francis Mullan, New York, was named assistant secretary-treasurer and R. H. Delafield, New York, was elected chairman of the executive committee.

Mr. Woods became vice-president and general manager of the Kansas City, Clay County & St. Joseph Railway eight years ago. He had been city representative of the Kansas City Railways board of control since 1914. In this work he had had supervision over many of the improvements made by the company. He continued as consulting engineer to the board as he was in a position to direct the carrying out of the extensive traffic improvements which were being made under the direction of John A. Beeler.

Mr. Woods has had a long career in railway activity. In 1901 he was made chief engineer in charge of construction of the Wabash River Traction Line. One year later he was appointed to a similar position with the Indianapolis-Shelbyville interurban. From 1902 to 1904 he served the Indianapolis & Northwestern Traction Company as chief engineer. Later he was consultant in charge of design and construction of the Lebanon-Thornton Electric Railway, Lebanon, Ind. When the line was completed he was made vice-president and general manager. This position was followed by his becoming president of the company. From 1911 to 1913 he had charge of the building of the 80-mile line of the Kansas City, Clay County & St. Joseph Railway.

Mr. Woods was born in Buffalo, N. Y., in 1870. At the age of 21 he entered engineering work. For the next ten years he was engaged in a number of utility projects.

Dwight P. Robinson Heads New Concern

Engineer of wide experience elected president of United Engineers & Constructors, Inc.

DWIGHT P. ROBINSON, for 35 years engaged in bringing large construction enterprises to completion with speed and economy, has been selected as president to head the United Engineers & Constructors, Inc., organized to merge Dwight P. Robinson & Company, Inc., New York; the U. G. I. Contracting Company, Philadelphia; Public Service Production Company, Newark, N. J., and Day & Zimmermann Engineering & Construction Company, Philadelphia, to which reference is made elsewhere in this issue.

With his organization of unusually capable and devoted men, Mr. Robinson, as the first president of the American International Shipbuilding Corporation, developed Hog Island. He resigned from this company in the spring of 1918

D. P. Robinson

and in the fall of that year he organized Dwight P. Robinson & Company, Inc., New York, to conduct an engineering and construction business. One of the first contracts of this company was for the design and construction of the Colfax power station for the Duquesne Light Company, Pittsburgh, planned for an ultimate capacity of 360,000 kw. In 1920, Dwight P. Robinson & Company absorbed Westinghouse, Church, Kerr & Company, established in 1884, and nationally known as railroad and industrial builders.

Mr. Robinson was born in Boston on May 1, 1869. In 1890 he was graduated from Harvard and two years later from the Massachusetts Institute of Technology, where he obtained his electrical engineering education. After graduation, he was an assistant in the mechanical engineering laboratory at the latter institution and in 1893 joined the organization of Stone & Webster. Within a few months he was placed in charge of the Chicago office of that company. From 1895 until 1903 he was engaged in operating light and power properties under Stone & Webster management.

In 1903 Mr. Robinson returned to Boston in charge of all Stone & Webster engineering, and when the Stone & Webster Engineering Corporation was formed he was made president in charge of both engineering and construction activities. In 1912 he was admitted to partnership. From 1912 to 1918 he had charge of notable hydro-electric developments in Washington, California, Connecticut, Maine, Georgia and Montana, and the building of steam power stations at Seattle, Minneapolis, Boston, Houghton (Mich.), Savannah, Jacksonville, Tampa, Pensacola, Columbus, Dallas, Fort Worth, El Paso, Houston, Port Arthur, Pittsfield, New Bedford and Bridgewater, Mass.

Barney Frauenthal Honored by St. Louis Railway Club

Whether the recent eulogy of Barney Frauenthal by W. G. Besler, chairman of the board of the Central Railroad of New Jersey, speaking before members of the St. Louis Railway Club, was the real cause, at any rate the members of that organization have wanted to express their appreciation of the work of their secretary. Accordingly at the meeting on Dec. 9 Mr. Frauenthal was presented a handsome radio set by the club, Mr. Hannauer, president of the Boston & Maine, coming all the way from New England to take part in the presentation.

Mr. Frauenthal has served the St. Louis Railway Club from 1906 to 1927. His activities have not been confined to the railroad world alone, as his civic interests have been quite extensive. When the new Union station was built in St. Louis in 1894, he was put in charge of the bureau of information and there provoked much public comment and won praise for his quickness, accuracy and reliable memory. He later became general ticket agent of the Terminal Railroad, in which position he remained until he was made special assistant to the late Benjamin F. Bush, federal director of the Southwestern Region.

Before the termination of "Federal Operation," Mr. Frauenthal accepted a position with Rolla Wells, receiver of the United Railways of St. Louis, as general traffic agent, which office he holds with the United Railways' successor, the St. Louis Public Service Company.

Probably few men in the city of St. Louis have so wide a circle of friends as Mr. Frauenthal. His acquaintance in the railroad and electric railway world is national.

The St. Louis Railway Club has about 1,000 members.

CLIFFORD J. DELBRIDGE, for seven years accountant and traveling auditor, checking auto transportation operators for the Department of Public Works at Olympia, Wash., has resigned to devote his time to the Portland, Centralia & Cowlitz Valley Truck Line, which he owns.

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Manufactures and the Markets

New Officers Elected for Westinghouse Electric

At a meeting of the board of directors of the Westinghouse Electric & Manufacturing Company, held in New York recently, the following officers were elected: Clinton M. Finney, comptroller; Warren H. Jones, secretary; Edward J. Mulligan, assistant secretary.

Mr. Finney comes to the Westinghouse organization from the Worthington Pump & Machinery Company, where he held the office of comptroller since 1919 and of vice-president since 1926. Prior to that time he was secretary and treasurer of the Mack Truck companies and treasurer of the George V. Cresson Company. He is a native of Pennsylvania and a graduate of the University of Pennsylvania. In 1926 he was elected president of the National Association of Cost Accountants.

Mr. Jones has held the position of assistant secretary of the Westinghouse Electric & Manufacturing Company since 1911. He was previously secretary to Robert Mather, former chairman of the Westinghouse board. He was born in Amherst, Mass., graduated from the LaGrange, Ill., High School, and studied law at the Chicago Law School and in the legal department of Winston, Payne & Strawn, Chicago.

Mr. Mulligan after attending the Port Richmond, Staten Island, High School, began his business career as office boy to George Westinghouse 25 years ago. Since that time he has remained continuously in the executive department of the Westinghouse company, rising from one position to another. During recent years he was secretary to James C. Bennett, formerly comptroller and secretary, now vice-president.

Receiver Authorized to Purchase 23 Freight Cars

William A. Carson, receiver for the Evansville & Ohio Valley Railway, Evansville, Ind., operating to Mount Vernon, Grandview and Henderson, Ky., has been authorized by Judge Elmer Q. Lockyear, of the Vanderburgh County Probate Court, to buy 23 freight cars to haul coal and gravel. The receiver stated that this number of cars could be purchased from a Kentucky firm at a reasonable figure.

Ten New Units Arrive for Milwaukee Electric Lines

Genuine leather upholstery and added seating capacity are innovations in the ten new one-man cars recently received by the Milwaukee Electric Railway & Light Company, Milwaukee, Wis., from the manufacturer, the St. Louis Car Company, St. Louis. Mention that the order for these cars had been placed was made in the issue of the JOURNAL for Oct. 15, 1927. Except for minor details they are identical with 50 cars bought a year ago.

The cars, built at a cost of nearly $14,000 each were scheduled to be placed in service on the State Street line (Route 11) on Sunday, Jan. 15.

The new cars have semi-indirect lighting fixtures, electric heaters, automatic treadle exits, concealed air-control pipes, and latest safety devices. Seating capacity for 55 passengers is provided as well as a reversible, upholstered operator's seat with backrest on each platform in place of a portable stool.

Much of $200,000 Program for Asheville's Railway

The Carolina Power & Light Company has appropriated $200,000 for improvements and further extension of its system in Asheville for the year 1928. The full program has not been completed, but extensions of the railway and possible improvements to the present office facilities will be included in the expansion.

With completion of the 1928 building program, the company will have expended approximately $500,000 in the past three years. More than $90,000 has been spent in extension of the railway system during the past ten months, while next year quite a large sum will be set aside for the same purpose. The carhouse now under construction in Mud Cut will cost $150,000.

Construction and Contracting Firms Merge

Dwight P. Robinson & Company, Inc., U.G.I. Contracting Company, Public Service Production Company, Day & Zimmermann Engineering & Construction Company are Brought under the title "United Engineers & Constructors, Inc."

THE merger, under the name of United Engineers & Constructors, Inc., of four important engineering and contracting organizations was announced on Jan. 17, 1928. The companies included are: Dwight P. Robinson & Company, Inc., New York; U.G.I. Contracting Company, Philadelphia; Public Service Production Company, Newark, N. J., and Day & Zimmermann Engineering & Construction Company, Philadelphia.

The new company is launched with contracts in hand amounting to more than $100,000,000. With the work now under way, including the construction of large dams for the Government on the Ohio River, extensive hydro-electric developments on the Housatonic River in Connecticut, important work in South America and in Spain, and large office and apartment buildings in New York and other cities, United Engineers & Constructors starts business with an unusual program. Dwight P. Robinson has been selected president of the new company. Directors include Mr. Robinson, Arthur W. Thompson, president United Gas Improvement Company, who is chairman of the board of the new company; Thomas N. McCarter, president Public Service Corporation of New Jersey; Samuel T. Bodine, chairman of the board of directors United Gas Improvement Company; Paul Thompson, a vice-president of the United Gas Improvement Company and president of the Philadelphia Gas Works Company; and John E. Zimmermann, president of Day & Zimmermann, Inc.

Details of the financial features of the plan under which the combination was effected have not been made public but it is understood that an exchange of stock similar to the proceeding in the acquisition of Day & Zimmermann, Inc., by United Gas Improvement Company is involved.

The new company is singularly well equipped by virtue of wide geographical range of offices to undertake engineering work in many localities. Headquarters will be in Philadelphia but local representation in New York, Newark, N. J., Chicago, Los Angeles, Atlanta, Houston, Pittsburgh, Montreal, Buenos Aires and Rio de Janeiro will be maintained.

Each of the companies involved has a record for successful consummation of large engineering projects with particular relation to the public utility field.

The U.G.I. Contracting Company's operations date back to 1882, when the United Gas Improvement Company was incorporated to engage in engineering and construction. After the United Gas Improvement Company had branched out into the operation and management of utility properties, it continued the contracting business as a construction department. For years the principal work was building and installing Lowe carburetted water gas plants, patents for which were held by United Gas Improvement Company. The operations expanded, taking in the building of coal gas and electric power plants and manufacturing and applying road binders. The U.G.I. Contracting Company was incorporated in April, 1919. It has built and equipped gas and electric plants, office buildings, factories, bridges, piers, tunnels and roads. It has built more than 1,000 carburetted water gas plants.

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Recently it acquired the rights to build the German "Stettiner" coal gas ovens in America. Among the steam power plants built by the U.G.I. Contracting Company are the 50,000-kva. Barbadoes Island station, near Norristown, Pa., the 75,000-kva. Devon (Conn.) station, the 37,500-kva. Big Sioux (Sioux City, Ia.) station and the 33,333-kva. station of the Comal Power Company, New Braunfels, Tex. It also built the Stevenson dam and power plant on the Housatonic River in Connecticut and four dams and locks on the Ohio River for the United States government, which form part of the Government's program to make the river navigable at all times. It has under construction extensive hydro-electric developments in Connecticut and Vermont.

Public Service Production Company, a subsidiary of Public Service Corporation of New Jersey, was incorporated on Jan. 27, 1922. It built the $33,000,000 Kearny electric station, the Harrison gas works of Public Service, as well as many substations, garages and other buildings, and has erected considerable mileage of high tension lines and has done other work of importance for these organizations. It has also built roads in New Jersey, North Carolina and other states, including the so-called "covered cut," the approach to the Holland vehicular tunnel, has erected several important mills and factories and office buildings, including the eighteen-story Federal Trust Company building, Newark, and has performed many engineering and construction services for public utility, industrial concerns and steam railroads.

Day & Zimmermann Engineering & Construction Company was organized by Day & Zimmermann, Inc., to handle its engineering and construction activities. This firm has a background of more than 25 years of experience in the layout, design and construction of industrial plants, power plants, transmission lines and wide variety of general structures such as hotels, office buildings, warehouses, and port terminal developments. The 220,000-volt transmission lines from Conowingo to the Philadelphia territory are now under construction by this organization. It has been responsible for the design and construction of hydro-electric and steam electric power plants such as the 60,000 kw. (Saxton) station for Penn Central Light and Power Company.

During the war Day & Zimmermann did work for the United States Army, the Navy, the Shipping Board and the Alien Property Custodian. Included among the projects done for Government agencies was the United States Army Supply Base at Philadelphia, comprising the largest piers and warehouses in the port of Philadelphia. For many years Day & Zimmermann have been engaged in the layout and construction of large industrial enterprises such as new plants for the International Harvester Company, American Type Founders Company, Erie Forge & Steel Company, and many others. Institutional work has included such construction as the new dining hall and extension to buildings at Girard College, Philadelphia. Recently Day & Zimmermann have entered actively the field of hotel and hospital construction. The work of Day & Zimmermann Engineering & Construction Company is entirely separate from the investigation, report and management work which is done by Day & Zimmermann, Inc.

Dwight P. Robinson & Company has been a leader in the construction of large office buildings, hotels and apartment houses in New York, Chicago, Boston, Buffalo and other cities. Activities in addition to building work, include the design and construction of steam power stations, hydro-electric developments, substations, transmission systems, railroad shops, freight terminals, electrification of railroads, locomotive and passenger terminals, coaling stations, sugar refineries, smelters, lead plants, fertilizer plants, lumber mills, tanneries, shops, steel mills, foundries, textile mills, chemical plants, pipe lines and pumping stations, filtration and disposal plants, harbor and dock works.

The company has performed a large volume of work abroad. The principal contracts consist of irrigation projects for the Brazilian Government in northeastern Brazil, the construction of the Embassy of the United States at Rio de Janeiro and of the exhibits buildings during the Brazilian-Centennial Exposition, and the erection of an office building for the Rio de Janeiro Tramway, Light & Power Company, now in progress. In addition, important work is now being undertaken in Argentina.

General Electric Orders for 1927

Orders received by the General Electric Company during the year 1927 amounted to $309,784,623 compared with $327,400,207 for 1926, a decrease of 5 per cent, President Gerard Swope has announced.

For the three months ended Dec. 31 orders amounted to $76,708,532 compared with $80,406,570 for the final quarter of 1926, also a decrease of 5 per cent.

Sales billed and earnings for the year will be announced the latter part of March, when the annual report of the company is published.

Thirteen Buses in Puget Sound Power Budget

Included in the budget of $5,000,000 proposed for extension and construction work during 1928 by the Puget Sound Power & Light Company, Seattle, is provision for purchase of thirteen de luxe motor coaches to be put into the stage service during the year. These will be operated by the Pacific Northwest Traction Company, and by the North Coast Transportation Company, subsidiary concerns, both of which maintain offices in the company's Central Terminal building in Seattle.

Versare Bus for Boston Elevated Arrives

The Versare six-wheel bus is being introduced in Boston by the Boston Elevated Railway. The first bus from the Versare Corporation, Albany, N. Y., has arrived and is assigned to a route through the western business section of the city, from the Back Bay district to Bowdoin Square.

Washington Railway New Cars Scheduled for April Delivery

Details of the twelve cars for the Washington Railway & Electric Company, the order for which was mentioned in the JOURNAL for Dec. 17, 1927, have recently been released. The order for the units was placed with the J. G. Brill Company, Philadelphia, Pa. The cars will have an over-all length of 42 ft. 3 in., a seating capacity for 49 passengers, and will be of semi-steel construction. The exterior color scheme is to be cream and blue and the interior trim gray enamel and cherry. Four GE-265-A outside-hung motors are specified. Subjoined are the specifications as released by the Washington Railway & Electric Company.

Number of units	12
Type of unit	One-man, motor, passenger, city double-end, double-truck
Number of seats	49
Builder of car body	J. G. Brill Company, Philadelphia, Pa.
Date of delivery about	April 1, 1928,
Weight of car body	21,840 lb.
W ight of truck	18,360 lb.
Total weight	40,200 lb.
Bolster centers	19 ft.
Length over all	42 ft. 3 in.
Length over body posts	28 ft. 5 in.
Truck wheelbase	4 ft. 10 in.
Width over all	8 ft. 5 in.
Height, rail to trolley base	11 ft. 8 in.
Window post spacing	29½ in.
Body	Semi-steel
Roof	Monitor
Doors	End, folding
Air brakes	Westinghouse with variable load feature
Armature bearings	Plain
Axles	A.S.T.M., Specification A-20-21
Car signal system	Faraday high voltage
Compressors	Westinghouse DH-16
Conduit	Flexible
Control	K-35-JJ
Curtain fixtures	Curtain Supply Company
Curtain material	Pantasote
Destination signs	Keystone
Door mechanism	National Pneumatic
Energy saving device	Arthur power recorder
Fare boxes	Cleveland
Finish	Paint
Floor covering	Flexolith
Gears and pinions	Tool Steel Gear & Pinion Company
Glass	Plain
Hand brakes	Peacock staffless
Hand straps	Buffalo type
Heaters	Railway Utility
Headlights	Crouse-Hinds
Headlining	Agasote
Interior trim	Gray enamel and cherry
Journal bearings	Plain
Journal boxes	Brill
Lamp fixtures	Electric Service Supplies Company, dome type
Motors	Four GE-265-A, outside hung
Painting scheme	Cream and blue
Roof material	Canvas
Safety car devices	Westinghouse Traction Brake Company
Sash fixtures	Curtain Supply Company
Seats	Brill de luxe
Seat spacing	29½ in.
Seating material	Genuine leather
Steps	Folding
Step treads	Kass
Trolley catchers	Ohio Brass
Trolley base	Ohio Brass
Trolley wheels	More-Jones
Trucks	Brill 76-E-1
Ventilators	Railway Utility Company
Wheels, type	30-in., chilled iron
Wheelguards	Root

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Bids for Carhouse at Tacoma to Be Received

The Board of Contracts and Awards, Tacoma, Wash., it was recently reported, would receive bids soon for construction of a carhouse for the municipal belt line. Plans call for a building of frame and timber construction, to be completed within 45 days after signing of contract.

Week in Non-Ferrous Metals Quiet

Consumers of non-ferrous metals appear to be waiting for "something to turn up," judging from the comparatively small volume of sales during the week ended Jan. 18. None of the markets is dead, but the tonnage sold has been below the average. Except for New York lead, prices are quoted a little lower all along the line so far as domestic business is concerned. In London there has been practically no change in price levels, except that tin has declined.

A very sharp distinction can be drawn between the position of the important primary producers of copper and the so-called "custom" sellers. Without exception the former have been quoting 14⅛ cents, and that they have the courage of their convictions is proved by the fact that not a ton was sold by them. Actual sales in moderate volume were made each day until Jan. 18, during the week, at prices ranging from 14 cents to 14.10 cents, Valley, and at 14.125 cents at Middle West destinations. The preponderant tonnage has been placed at 14 cents. Business in the foreign market has been fair, about 25,000 tons having been sold thus far at the c.i.f. price of 14.50 cents.

The lead market has been disrupted in the week ended Jan. 18 by offerings by a Middle Western dealer at 6¼ cents, St. Louis—five points less than any producer had theretofore been willing to sell at. Producers have not been willing to meet this price, though the availability of lead at the lower level has been admitted, and to meet their regular customers halfway a 2½-point concession has been made from the quotations ruling last week, thus bringing producers' prices to 6.275@6.30 cents.

In the East, all sellers continue to quote at the contract price of the American Smelting & Refining Company—6½ cents, New York, for all deliveries, though lead is said to be available at some other consuming centers in the East at somewhat less than the usual differential from New York prices.

Zinc in fair volume was traded in during the week at 5.625 cents. A few sales for May-June delivery brought 5.65 cents.

London tin dropped below £250 on Jan. 16, and is now lower than for almost three years. Correspondingly low prices have obtained in New York, business having been done as low as 54¼ cents on Jan. 17 and 18.

ROLLING STOCK

TORONTO TRANSPORTATION COMMISSION, Toronto, Canada, has accepted delivery on fifteen Mack bus chassis, 233-in. wheelbase, six-cylinder motors, model AL. Bender Body Company is building the bodies.

PUBLIC SERVICE TRANSPORTATION COMPANY, affiliated with the Public Service Railway, Newark, N. J., has ordered five White Model 53 buses, supplementing recent orders for twelve of the same model and ten Model 54.

TRADE NOTES

NATIONAL PNEUMATIC COMPANY.—In the advertisement of this company appearing in the Jan. 7 issue of this paper, instead of the new Springfield, Mass., car, the car of another property was inadvertently shown.

C. MARSHALL TAYLOR has been appointed vice-president and general manager of the Curtin-Howe Corporation, 11 Park Place, New York, which holds the commercial rights to the new wood preservative developed by the engineering laboratories of the Western Union Telegraph Company. Mr. Taylor has been actively engaged in wood preservation since 1906, when he became associated with the International Creosoting & Construction Company, Galveston, Tex., in charge of that company's department of chemistry and tests. He served one year as assistant professor of chemistry at Swarthmore College and then built and operated for fifteen years the Port Reading Creosoting Plant for the Reading Company and the Central Railroad of New Jersey. During that period he was a member and subsequently chairman of the American Railway Engineering Association's committee on wood preservation. He served one term as president of the American Wood Preservers Association and is an affiliate of the American Society of Civil Engineers.

C. N. THULIN, vice-president of the Duff Manufacturing Company of Pittsburgh, has taken over the supervision of the Eastern sales district in addition to the Western sales district of this firm, of which he has been in charge for several years. Mr. Thulin's headquarters will be in New York and Chicago. W. G. Robb has been appointed district manager of the New York district, with headquarters at the company's office, 250 Park Avenue, New York. E. E. Thulin has been appointed district manager of the Chicago district with headquarters in the Peoples Gas Building, Chicago.

ELECTRIC RAILWAY MATERIAL PRICES—JAN. 17, 1928

Metals—New York

Copper, electrolytic, cents per lb.	13.788
Lead, cents per lb.	6.50
Nickel, cents per lb.	35.00
Zinc, cents per lb.	5.975
Tin, Straits, cents per lb.	54.25
Aluminum, 98 or 99 per cent, cents per lb.	24.30
Babbitt metal, warehouse, cents per lb.:	
Commercial grade	61.00
General service	31.50

Bituminous Coal

Franklin, Ill., screenings, Chicago	1.70
Central, Ill., screenings, Chicago	1.55
Kansas screenings, Kansas City	2.175

Track Materials—Pittsburgh

Standard steel rails, gross ton	$43.00
Railroad spikes, drive, ⅝ in. and larger, cents per lb.	2.80
Tie plates (flat type), cents per lb.	2.25
Angle bars, cents per lb.	2.75
Rail bolts and nuts, cents per lb.	3.90
Steel bars, cents per lb.	1.80
Ties, white oak, Chicago, 6 in.x8 in.x8 ft.	$1.40

Hardware—Pittsburgh

Wire nails, base per keg	2.55
Sheet iron (24 gage), cents per lb.	2.80
Sheet iron, galvanized (24 gage), cents per lb.	3.65
Galvanized barbed wire, cents per lb.	3.25
Galvanized wire, ordinary, cents per lb.	2.40

Waste—New York

Waste, wool, cents per lb.	16–20
Waste, cotton (100 lb. bale), cents per lb.:	
White	16–19.50
Colored	11-16

Paints, Putty and Glass—New York

Linseed oil (5 bbl. lots), cents per lb.	10.2
White lead in oil (100 lb. keg), cents per lb.	13.25
Turpentine (bbl. lots), per gal.	$0.65
Putty, 100 lb. tins, cents per lb.	5.25–5.50

Wire—New York

Copper wire, cents per lb.	15.875
Rubber-covered wire, No. 14, per 1,000 ft.	5.30
Weatherproof wire base, cents per lb.	16.75

Paving Materials

Paving stone, granite, 5 in. New York—Grade 1, per thousand	$150
Wood block paving 3½, 16 lb. treatment, N. Y., per sq.yd.	$2.70
Paving brick 3½x8½x4, N. Y., per 1,000 in carload lots	51.00
Paving brick 3x8½x4, N. Y., per 1,000 in carload lots	45.00
Crushed stone, ¾-in., carload lots, N. Y., per cu.yd.	1.85
Cement, Chicago consumers' net prices, without bags	2.05
Gravel, ¾-in., cu.yd., f.o.b. N. Y.	1.75
Sand, cu.yd., f.o.b. N. Y.	1.00

Old Metals—New York and Chicago

Heavy copper, cents per lb.	11.875
Light copper, cents per lb.	10.25
Heavy yellow brass, cents per lb.	7.375
Zinc, old scrap, cents per lb.	3.625
Lead, cents per lb. (heavy)	5.31
Steel car axles, Chicago, net ton	$16.25
Cast iron car wheels, Chicago, gross ton	14.25
Rails (short), Chicago, gross ton	15.50
Rails (relaying), Chicago, gross ton (65 lb. and heavier)	28.50
Machine turnings, Chicago, gross ton	8.00

ADVERTISING LITERATURE

CROUSE-HINDS COMPANY, Syracuse, N. Y., has issued an illustrated mailing folder descriptive of its new Obround condulets, and bulletin 2104 on its "Wedgtite" pipe hangers.

GENERAL ELECTRIC COMPANY, merchandising department, Bridgeport, Conn., has issued a small folder entitled "The Concentrated Arc in Welding."

OHIO BRASS COMPANY, Mansfield, Ohio, is mailing an illustrated folder, No. 138H, entitled "Take a Tip" calling attention particularly to its O-B double-arm and pole-top insulator fittings. A return postal card is inclosed with folder on which a request can be made for the company's new booklet 516H.

ALBAUGH - DOVER MANUFACTURING COMPANY, Chicago, Ill., has recently issued bulletin A in the form of an illustrated booklet giving complete information on its speed reducers.

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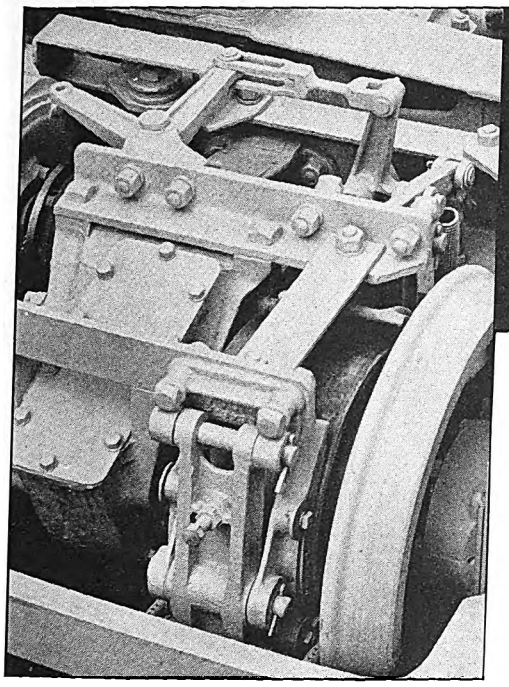

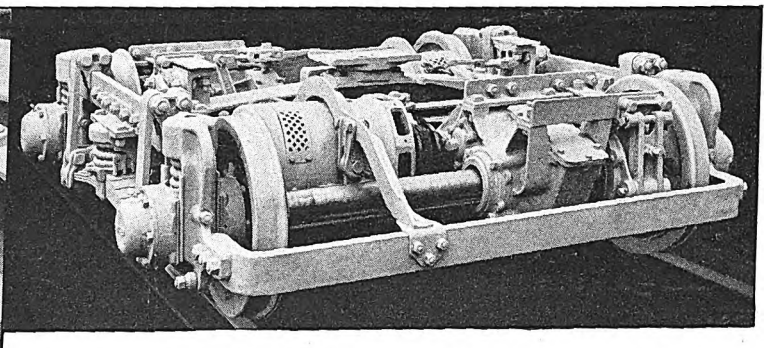

Brill No. 277-EX Trucks
under
"The Car for 1928"

A Real Advance in Brake Design

As a means of reducing annoying brake noises to meet the demand of "the Car for 1928" Brill engineers developed a novel external contracting shoe type drum brake.

There is a wide drum pressed on each axle, located diagonally across the truck. A separate air brake cylinder, directly connected to the actual pressure-applying levers, is located adjacent to each drum, thus eliminating many rigging parts and any noise or loss of effectiveness of brake application to which they might contribute. Also with this drum type brake the possibility of water, slush and grit interfering with the brake efficiency is reduced.

The external contracting or "clasp" type brake minimizes wear on journal boxes and sideframes, as well as eliminating rolling or shifting of journals upon brake application. It also facilitates free movement of journal springs and permits their functioning to better advantage.

The drum type brake is one of the outstanding improvements of the Brill No. 277-EX Truck upon which the Brill 1928 Model Car is mounted.

THE J. G. BRILL COMPANY
PHILADELPHIA, PA.
AMERICAN CAR CO. ST. LOUIS MO. — G.C. KUHLMAN CAR CO. CLEVELAND, OHIO. — WASON MANF'G CO. SPRINGFIELD, MASS.

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PLYWOOD HASKELITE PLYMETL

HASKELITE

PLYWOOD HASKELITE PLYMETL

in the new cars at Atlanta, Georgia

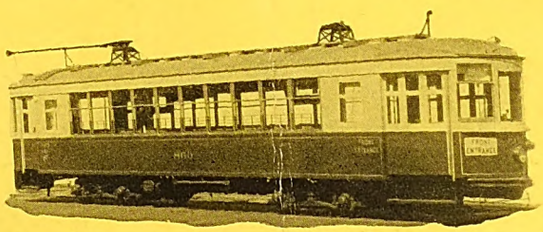
HASKELITE for headlining and interior trim was specified in the 40 cars recently built by the Cincinnati Car Company for the Georgia Power Company for service in Atlanta.

This is not an experiment with this company. HASKELITE headlinings were installed in the cars built in 1925 and this material has also been applied in two later orders for other applications.

The constantly growing list of leading properties on which HASKELITE or PLYMETL is used is conclusive evidence of their lasting satisfaction. More than 50 companies have applied these structural plywood panels in street cars during 1927. Still others have used them in bus construction.

The common uses include roofs, floors, side panels, headlinings and interior trim. A completely-equipped car will show a saving in weight of more than 900 lbs., producing an operating economy that should compel attention from any electric railway executive. May we send you facts regarding the light weight and great strength of HASKELITE and PLYMETL, to show you how others use them and some of the operating results achieved?

HASKELITE MANUFACTURING CORP.
133 West Washington Street, Chicago



Railway Representatives:

Economy Electric Devices Co., 37 W. Van Buren St., Chicago
Grayson Bros., 600 LaSalle Bldg., St. Louis, Mo.
Railway & Power Engineering Corp., Toronto, Ont., Canada

PLYWOOD HASKELITE PLYMETL

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ELECTRIC RAILWAY JOURNAL

McGraw-Hill Publishing Company, Inc. JANUARY 28, 1928 Twenty Cents per Copy

CORNELL UNIVERSITY JAN 30 1928

ALMOST every maker of buses in America has widely adopted Timken Bearings. Many of the greatest European bus manufacturers are Timken users. Transcontinental trains, suburban trains and self-propelled cars are running on Timken Bearings. *And trolley companies are going to Timkens.*

The combination of anti-friction operating economies with highest endurance—the result of Timken tapered construction, Timken *POSITIVELY ALIGNED ROLLS* and Timken electric steel—is what makes Timken Bearings inevitable for all modern transportation.

THE TIMKEN ROLLER BEARING CO., CANTON, OHIO

TIMKEN *Tapered Roller* **BEARINGS**

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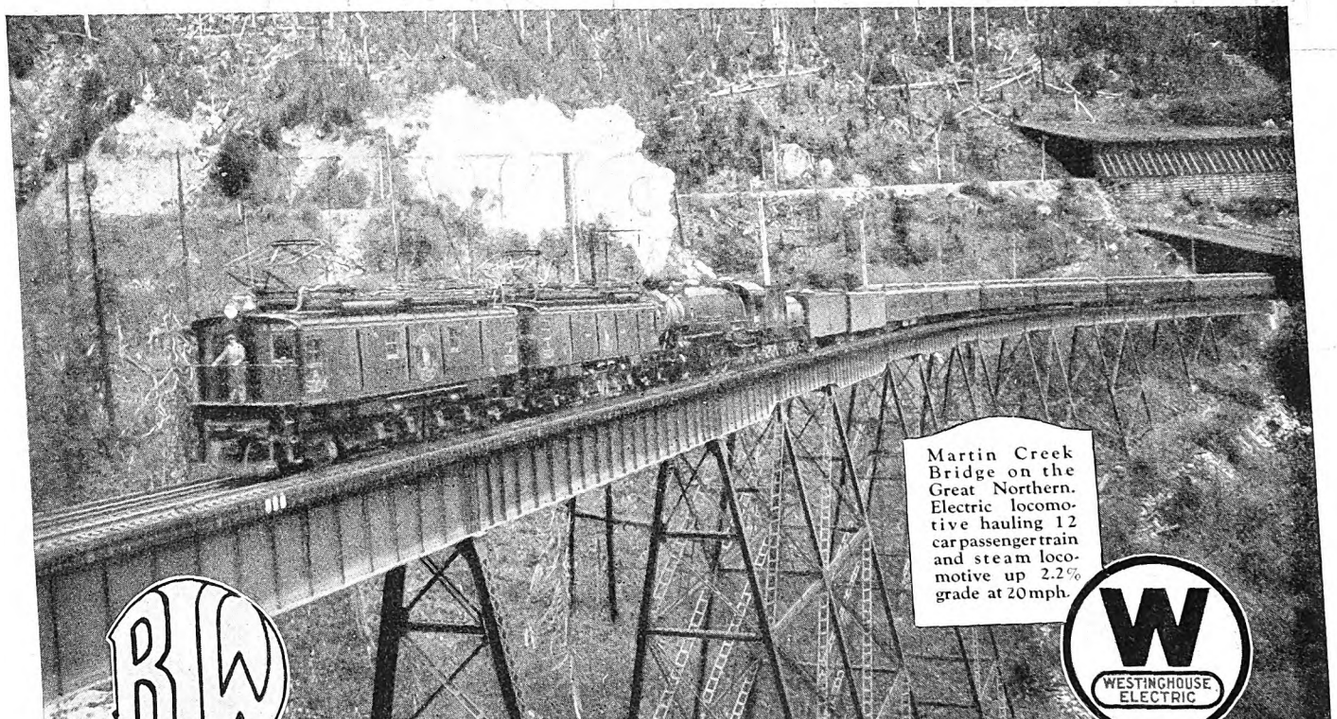

Building an Empire

IT required faith—sustained confidence in the growing prosperity of our country—to blaze a trail across the nation. The Great Northern Railroad is a lasting monument to the vision of these intrepid pioneers.

Competitive conditions are making far-sighted, progressive management of equally great, if not greater importance today. In this the Great Northern took the initiative. The electrified section extending from Skyhomish, Washington, through the present Cascade Tunnel is eloquent evidence of this pioneering instinct. With the completion of a new eight-mile tunnel which will shorten the present route by seven and one-half miles, the electrified zone will cover nearly 100 miles. Baldwin-Westinghouse electric locomotives will operate on this new extension.

Twenty-one of the twenty-six miles already electrified are on a 2.2% grade. With steam motive power the speed on this grade was seven miles an hour. Electrification has made possible operation at more than twice this speed and the handling of larger tonnage trains. Freight and passenger trains, therefore, are moved with greater ease and dispatch and operating costs are reduced proportionately.

Another outstanding achievement is the fact that the world's most powerful motor-generator locomotive, capable of hauling 200-car trains operate on this road. These new giants, which were built by Baldwin-Westinghouse, can exert 7,000 hp. under maximum conditions and have a continuous rating of more than 3500 horsepower. Having transformers and motor-generators as part of the equipment, they utilize high voltage a-c. current on the trolley to drive d-c. traction motors, thus providing the outstanding advantages incident to a high-voltage trolley supply coupled with direct current motor drive.

The Baldwin Locomotive Works
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Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review
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CHARLES GORDON, *Editor*

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A Champion for the Car Rider Arises in Philadelphia

PHILADELPHIA at last seems to be awakening to the serious nature of its traffic congestion problem. At least partial credit for that awakening must be ascribed to the shrill alarm sounded by the local transportation company. "Give the 80 per cent a square deal" has been and is still being held before the eyes and dinned into the ears of the people in an intensive advertising and publicity campaign described elsewhere in this issue. The 80 per cent is, of course, that overwhelming majority of street users who enter and traverse the downtown area by means of the street car.

The Philadelphia Rapid Transit Company is frank to admit, in sponsoring this campaign, that its own ends will be served, as well as those of the car rider, in any speeding up of street traffic which may be effected. But it is significant that the newspapers and civic associations of Philadelphia, while realizing this fully, have been unanimous in their approval and active backing of the undertaking.

Much of today's street congestion is due to the human factor—to that spirit of impatience, of headlong speed and of indifference to the rights and privileges of fellow beings which seems to characterize city living in this 20th Century. If he is an autoist, he will park when, where and for as long as he pleases, or can get away with. He will cut in and out of traffic lanes with a mere shrug of the shoulders for the danger he is causing to others and to himself. He will block traffic for others but curse volubly when his own way is barred by another individual of the same stamp.

The pedestrian is not much better. He has little or no regard for traffic signals, anti-jay-walking edicts and other safeguards for life and limb, unless a policeman with a big stick cows him into submission. Truly, he rushes in where angels fear to tread.

Such tactics as these are bacilli from which germinate many of our present traffic diseases. If the slate could be wiped clear of human folly, our metropolitan areas could readily get along for a few years without the tremendous engineering developments in subways and elevated highways which are now being proposed on every hand to relieve street congestion.

It is a matter of education and of pleas to the common sense of the individual. That is what the Philadelphia Rapid Transit Company has been trying in its community. It is no use to call upon the strong arm of the law for assistance while public opinion remains apathetic. That same public opinion is often a very difficult thing to arouse on matters which properly should concern it. Still greater difficulty may be experienced in maintaining the sentiment once aroused.

One thing the transportation company has very definitely accomplished with its "80 per cent," however. It has fixed the blame for traffic delays squarely upon those who are responsible. Easy enough to attack the transit organization when cars are tied up and passengers are forced to wait on chilly street corners. But the company has demonstrated to the satisfaction of fair-minded Philadelphia citizens that it is vitally interested in getting its cars through traffic on schedule time. It has planked down cold cash to get that thought across.

The Brady Award Will Help the Cause of Safety

SAFETY in railway operation has always been a prime consideration of the managements. Safety for passengers—at least reasonable safety—had to be assured, as otherwise there would be no patrons. Safety for persons other than passengers had also to be obtained because of the danger of damage suits. Yet it is somewhat remarkable that the emphasis now placed on safety by railway companies is a comparatively modern development. This is shown by the fact that the first comprehensive safety exposition in America was held in New York City less than 15 years ago.

A tremendous impetus to the safety movement on electric railways was undoubtedly given by the great increase in number of automobiles on the streets which has come about during the last decade and a half—and is still continuing. Today no electric railway organization is complete without its safety division or department. There is every reason to believe that the attention now being given to safety on most electric railway properties will increase rather than decrease as years go by. It is a matter for congratulation, therefore, that the Brady annual awards to electric railway companies for excellence in safety methods and results have been revived.

These awards were first made in 1914 when under the original deed of gift one medal was given to the company submitting the best record of methods and the two other medals were given to individual officers or employees of the same company because they had distinguished themselves by efforts to promote safety on their property. This plan has now wisely been changed so that the three awards are made to three different companies, representing respectively large, medium-sized and small properties. The change permits fairer judgment on the merits of the contestants' claims because it is obviously very difficult for anyone to fix standards of operation which will fit equally well companies with widely different outputs in annual car-miles.

The winning company in the largest class this year, the Louisville Railway, is very closely associated in the minds of most railway men with the modern safety

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movement. This is partly because of general knowledge of what the company has done along these lines. It is also partly due to the active interest which its president, James P. Barnes, has always taken in matters relating to safety. The safety work of the other two winners, the El Paso Electric Company and the Tide Water Power Company, are less well known only because of their smaller size, so that their efforts have been on a less extensive scale. But the records show that both have accomplished wonderful results.

An account of some of the safety methods in Louisville appears in this issue. Later issues will tell of the work done by the other winners.

Mileage and Securities in Receivership Materially Reduced

JUST as 1926 showed an improvement in the number and importance of electric railway companies in receivership over 1925, so 1927 showed an improvement over 1926. The situation of the Chicago Railways is peculiar in that the principal of the bonds is in technical default, but the interest payments are being made from earnings that are in every way more than adequate for all the company's financial purposes. There the ability to refund was to a very large measure presaged on the settlement of the franchise situation. That property, through no inherent fault of its own, is the only large city system still subject to the jurisdiction of the courts. The Des Moines case is also peculiar in many respects, since that company was unable to refund one of its maturing obligations. There the earnings situation is not so auspicious as is that of the Chicago company, and while it is a cause for anxiety, the concern is more over general economic conditions and the uncompromising attitude of labor, which has refused to co-operate with the company to the extent of making it possible for the railway to put into effect economies that would have helped materially to avert the receivership.

As to the facts and figures of receivership for 1926 they show a decided reduction in mileage, capital stock and funded debt involved in such proceedings. The biggest help to this end was the lifting of the receivership of the United Railways in St. Louis with its 450 miles of track. The way had long been prepared for this change, but it was not until quite recently the St. Louis Public Service Company, the successor road, formally took over the property. The delay there in carrying out the plan was undoubtedly due in no small measure to the franchise situation, still to be settled by the enactment of a new grant modern in its terms.

Two large interurban properties are still in receivership, the Detroit United Railway and the Union Traction Company of Indiana. Each of these roads has more than 400 miles of track. Only six of the remaining 48 companies in receivership at the close of the year have more than 100 miles of track. Eight of the 48 companies have 50 or more miles and the balance of 34 companies have less than 50 miles of track.

These are merely the major factors. The details were given in the Jan. 14 issue. Taking into consideration the reduction of almost 13 per cent in mileage and 22½ per cent in securities involved in receivership and with the prospect of several of the large companies reorganizing this year, the outlook for 1928 is more encouraging than it has been for many years.

San Francisco's Municipal Railway Is No Exception to the Rule

AFTER allowing for charges that practically put it on a par with privately owned companies, the Municipal Railway in San Francisco piled up a loss of $240,228 for the year ended June 30, 1927. The details are given in the issue for Jan. 7, but the matter deserves attention beyond mere presentation of the statistical data. Let it be said at the outset that great perspicacity has been shown in the management of the system. No one can gainsay that. Despite this the record is not the rosy one some of the proponents of municipal ownership paint it. The earned surplus for the 14½-year period of operation is $2,835,000, but when the comparison charges intended to bring the property into line with the burdens a private company would have to bear are taken into consideration the system, operating under a 5-cent fare, is found to be in the red about $314,000.

At first blush this appears to be pretty good. But it must be taken into account that the railway is one of only 74 miles, operated from its inception in one of the most populous sections of the city. Now there are 11.89 miles of bus lines doing none too well. One of the most vociferous of the advocates of the system says that under conditions prevailing prior to 1917 the railways in San Francisco could easily have paid for themselves out of earnings on the 5-cent fare. It is a nice hypothetical question, but it does little good so to speculate since the times have changed greatly, as the report under review indicates. In this case it is a condition and not a theory that confronts the system, which is gradually being brought into a state that more nearly approximates the condition of the average privately owned system.

A champion of municipal ownership has said that doubtless the new lines and the added bus routes are useful in the development of the outlying sections, but "they are putting a strain on the 5-cent fare." Even its proponents now admit that under present conditions it is apparent that for the future, with even the most conservative extension policy, the municipal railway cannot hope to earn a substantial surplus above interest charges, without making any provision for bond redemption or the construction of extensions out of earnings.

Dallas Should Heed the Plea of Its Railway

CASH fares of ten cents are asked by the Dallas Railway & Terminal Company in a request filed with the Board of Commissioners of that city. The other fares would be 5 tickets for 35 cents, with students' tickets at 4 cents, and children 5 to 12 years of age, 4 cents. The point made by the company is that by establishing an adult cash fare of 10 cents it is possible to give the regular user of the service a much lower rate than if a flat fare were established for all classes of riders.

At first sight this plea would not seem to be unusual. In some of its aspects it is not. It reflects the changed trend in economic conditions which has imposed unusual burdens on the electric railways, but more than that, it reflects conditions which beset the railway in the moderate sized city—Dallas has a population of 211,600—determined to keep its property up and to give the very best service possible. That, of course, cannot be done

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without the constant expenditure of money. What the company now seeks is to keep up its credit standing, since in order to attract new capital to provide for extensions, betterment and improvement at reasonable cost the company's net earnings after the payment of operating expenses should be sufficient to pay a reasonable return on the property value, and in addition to accrue regularly to the various reserves enough to maintain them at normal, as defined in the franchise.

This is substantially the way the company put the case. Its plea has been referred to previously in ELECTRIC RAILWAY JOURNAL. Since the company began operation under the present modified service-at-cost grant on Oct. 1, 1917, it has failed to receive the full 7 per cent per annum on its approved property value by the sum of $536,331. Between April 1, 1926, and Dec. 31, 1927, the company expended $1,350,000 on improvements. During the next five years $2,228,000 will be needed for similar work, $1,050,000 alone for cars.

Dallas has long enjoyed one of the most up-to-date services in the country for a city of its size. It can, however, continue to enjoy that service only as it sees to it that its railway is adequately compensated. The Dallas railway has certainly played fair with the city. If it is to continue to prosper and grow as a city, Dallas must play fair with its railway.

Reno's Road to Transportation Ruin

CESSATION of service by the railway in Reno, Nev., last fall attracted considerable attention. Many newspapers and publications referred to the matter as indicating the passing of the street car, since it was stated that buses would be put in the service to replace the railway. If memory does not play false, even Arthur Brisbane took occasion to pen to 7,000,000 people, or whatever number it is he reaches in the chain for which he writes, a homily for their delectation. But that is quite a long while ago and Mr. Brisbane lives in the future, not in the past.

But the present concern is with the facts, not with prognostications affecting a whole industry tossed of by a sage who writes as he runs. What are the facts? The Reno road was one of 7.5 miles, built in a city of 12,016 population, not counting the flotsam and jetsam on the way to other experiences. There were six cars. The road represented the elation of promoters who sought to put in railway systems just north, east, south and west of every water-tower town that had hopes of springing into a metropolis. This is no reflection on Reno. It has a right to its ambitions and enthusiasms. But the record of Reno in history is not likely to rest on the fact that the railway there gave place to buses nor on the subsequent fact that the buses in turn have had to suspend service.

Not so much has been made of this latest fact, however. For some reason it is not the same savory morsel for comment as the passing of the railway. Reno has its place, as many people of both sexes have learned, but it is not the place for the bus or the trolley. This is no conclusion thrown off lightly in a moment of exhilaration. It is based on a plain statement of fact contained in a ponderous volume apparently unknown by the daily newspaper columnists and commentators. This big book is known as "Moody's Manual of Investments." It is a prosaic tome at the sight of which the inspiration of the literati would be immediately dispelled. This book is freezing in its formality, but it does contain facts.

For the three years that this volume records the earnings of the Reno road it sets down the gross at $40,641 in 1924; $39,155 in 1925, and $35,718 in 1926, and the deficits for the three years at $10,770, $4,820, and $8,902 respectively. The company never paid a dividend. The fact is that Reno's local transportation situation is no different from that of other small communities. The fault is not with the trolley or the bus. The fault is with Reno. It is just not big enough to support any kind of organized transportation service, other perhaps than the taxi.

One Good Plan in Practice Is Better Than Many Plans in Contemplation

PERSONAL opinions advanced without facts or figures to support them constitute one of the big obstacles in the way of solving the traffic problem. Of course, every one is entitled to his own opinion on this subject, and to express it if he so desires. But personal opinions are not facts, and any satisfactory solution of the problem must be based on facts. For instance, a statement is made in a letter recently published in the New York *Times* that "it is doubtful whether it would be possible to increase the efficiency of the streets under present conditions by the enforcement of any regulations old or new to more than a very few per cent, whereas the situation calls for an increase of several hundred per cent." The writer of the letter believes that some sort of double-deck arrangement is the only way by which effective relief can be obtained. No data are presented to support either of his contentions.

Statements of this kind unsupported by facts or figures are not very convincing. In this instance the writer's first contention is easily shown to be false. Take Fifth Avenue, New York, for example. During the maximum hour a total of about 1,200 northbound vehicles pass 42d Street moving in two lanes at an average speed of approximately 5 miles per hour. With properly designed signal lights it would be possible for this traffic to move much faster. Experience has shown that the greatest volume of traffic moves along the street when the speed is about 15 miles per hour. No reason exists why this speed could not be attained on Fifth Avenue, New York, as has been done in various other cities. With parking eliminated traffic could move in three lanes. Under these conditions a total of more than 5,000 northbound vehicles per hour could be accommodated, an increase of more than 400 per cent.

Hope of relief from traffic congestion lies in making better use of existing streets rather than double decking streets, removing the elevated railway pillars, putting street cars underground and similar schemes. To try improved regulation and control would cost very little. The ultimate fate of such a plan would, of course, depend on the degree of success realized in use.

But experimentation is not the way of the New York municipal authorities. For fear of giving offense they hesitate to adopt any traffic regulations to which objection is made. Instead of trying any of the various reasonable plans that have been suggested for relief, the authorities continue to grope blindly for some ideal plan that will suit everybody. Meanwhile, congestion grows worse and the cost of traffic delays mounts higher and higher.

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Judges Award Safety Prizes

Electric Railways in Louisville, El Paso and Wilmington, N. C., win Brady Awards. Honorable mention for Pittsburgh

AS ANNOUNCED briefly in last week's issue, three Anthony N. Brady Memorial Medals for outstanding accident prevention and health promotion work on electric railways, for the year ended Dec. 31, 1926, have been awarded by the judges of the contest. The winners are the Louisville Railway, Louisville, Ky.; the El Paso Electric Company, El Paso, Tex., and the Tide Water Power Company of Wilmington, N. C. The Pittsburgh Railways received honorable mention and will be given a certificate. Announcements of the awards were made jointly on Jan. 23 by the American Museum of Safety and the American Electric Railway Association. From other statistics it was found by these two organizations that the electric railway industry as a whole during the twelve-month period covered by the contest, had reduced its fatal accidents approximately 15 per cent. Only one out of every 155,000,000 passengers carried during this period was fatally injured. This is declared to be the lowest accident ratio for any vehicle using the public streets.

The awards for 1926 were made to three railway organizations. This is a change from previous practice. The committee's purpose in this, it was announced, was to promote active competition for the awards by every electric railway, however large or small. Bus systems are included in the statistics covering the awards where these are operated as part of an electric railway system. It is expected that the presentation of the medals will take place some time in February with appropriate ceremonies.

The Brady award, originated in 1914, was discontinued during the World War after having been won by the Boston Elevated Railway, the Union Traction Company of Indiana and the Connecticut Company, and has been restored by Nicholas F. Brady at the request of the American Electric Railway Association. Gold, silver and bronze medals are awarded as first prizes to three classes of companies operating more than 5,000,000, from 1,000,000 to 5,000,000, and less than 1,000,000 vehicle-miles, respectively. Louisville, El Paso and Wilmington won in the order named.

The committee on awards consists of Lewis Gawtry, president of the Bank for Savings in the City of New York. Colonel A. B. Barber, manager transportation and communication department, Chamber of Commerce of the United States; James H. McGraw, president of the McGraw-Hill Publishing Company, Inc., and Lucius S. Storrs, managing director of the American Electric Railway Association.

The committee on the conditions of the competition consisted of Thomas Fitzgerald, vice-president of the Pittsburgh Railways, chairman; H. K. Bennett, safety manager, United Electric Railways, Providence, R. I.; C. H. Evenson, superintendent of transportation, Chicago Surface Lines.

The conditions of the contest just decided provide that every competing company shall submit accident data covering all electric railway and bus operations comprising the entire system of which it is a part, without regard to technical ownership, as well as to cover broadly and as completely as possible, all of the factors prescribed by the committee as conditions for obtaining the award. These factors were:

The success in gaining good will as indicated by the initiative, skill and enterprise manifested in improved safety conditions.

The improved safety conditions which have resulted from original ideas, as well as the extent to which the company has taken advantage of new development of safety in operating and maintenance practice and equipment originating with others.

Improvements in safety practice which have resulted in reduced maintenance, or greater reliability of service.

Particular success in conducting a safety program and actually reducing the number and seriousness of accidents.

Outstanding accomplishments in development of co-operation between management and employees in safety promotion.

Outstanding accomplishment in measures to promote sanitation and health.

All presentations had to be in the hands of the American Museum of Safety on or before August 1, 1927.

Accompanying the report of the committee was a series of tables compiled from the statistics submitted. One of these, as relating to the winning companies, is presented herewith. An article on some of the safety practices of the Louisville Railway appears elsewhere in this issue. Particulars of the practice of the three other companies which won for them prizes or a certificate will appear in subsequent numbers.

SUMMARY—DERIVED RATIOS AND COMPARATIVE UNIT FIGURES, RAILWAY OPERATION

	Year	Louisville Railway	El Paso Electric Company	Tide Water Power Company (Wilmington)
Ratio—Cost of accidents to gross earnings—per cent.	1926	3.00	2.71	0.48
	1925	3.11	4.29	1.42
	1924	3.65	2.87	2.01
	1923	4.26	3.55	0.63
Ratio—Amount paid in settlement of claims to the total cost of claims—per cent.	1926	63.34	52.46	30.41
	1925	60.12	67.23	65.31
	1924	65.31	45.32	97.03
	1923	69.50	54.23	86.52
Ratio—Cost of claims department to the total cost of claims—per cent. Bus figures included—with the exception of the Tide Water Power Co.	1926	20.01	38.44	69.59
	1925	22.08	28.24	19.89
	1924	19.14	46.26	2.96
	1923	17.58	39.24	13.47
Ratio—Amount paid in settlement for property damages to the total amount paid in settlement of claims—per cent.	1926	*	19.27	41.23
	1925	*	6.91	18.96
	1924	*	*	9.43
	1923	*	*	37.49
Ratio—Amount paid in settlement for personal injuries to the total amount paid in settlement of claims—per cent.	1926	*	80.73	58.77
	1925	*	93.09	81.04
	1924	*	*	90.57
	1923	*	*	62.51
Average cost per accident reported	1926	$17.03	$50.84	$30.50
	1925	21.59	64.34	82.06
	1924	23.04	39.06	65.81
	1923	26.30	31.28	26.13
Total cost of accidents per car-mile	1926	$0.012	$0.007	$0.001
	1925	0.012	0.011	0.004
	1924	0.013	0.007	0.006
	1923	0.016	0.010	0.002
Number of accidents per 10,000,000 car-miles operated.	1926	7,134	1,425	455
	1925	5,605	1,749	489
	1924	6,046	1,924	877
	1923	6,253	3,174	754
Collisions with motor vehicles per 10,000,000 car-miles operated.	1926	2,986	842	398
	1925	2,603	977	432
	1924	2,919	926	820
	1923	3,026	1,232	553
Collisions with cars per 10,000,000 car-miles operated.	1926	66	41	11
	1925	75	48	11
	1924	108	63	11
	1923	142	68	23
Collisions with other vehicles per 10,000,000 car-miles operated.	1926	206	34	11
	1925	215	42	11
	1924	284	31	23
	1923	413	83	33
Collisions with pedestrians per 10,000,000 car-miles operated.	1926	53	53	34
	1925	50	64	11
	1924	70	75	11
	1923	82	59	45
Boarding and alighting accidents per per 10,000,000 passengers carried.	1926	136	17	0
	1925	62	21	3
	1924	66	27	4
	1923	62	46	Not available

*Cannot be segregated.

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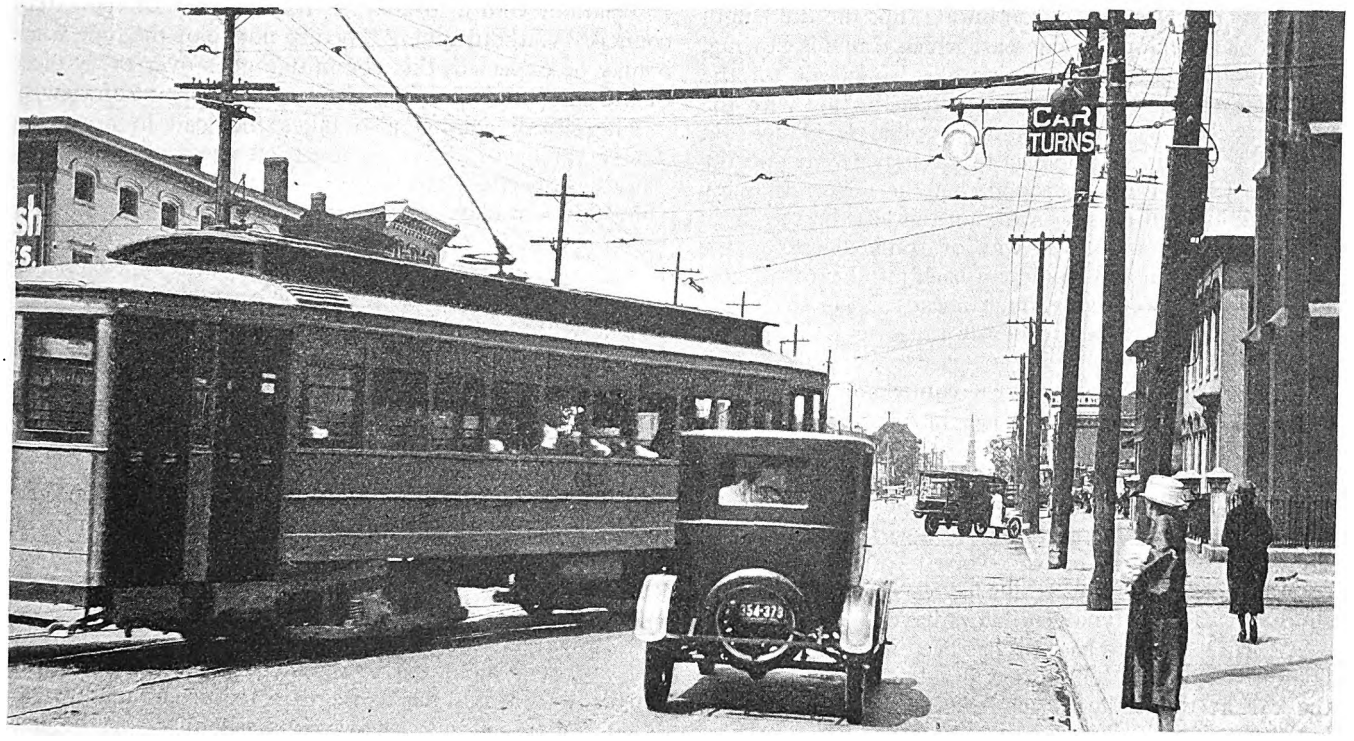
Safety a Science at Louisville

Winner of Brady medal prize for 1926 in large road class has devoted a great deal of study to safety precautions. Safety council is conducted by the employees. Various ways are adopted to maintain interest



The driver of the automobile at the right is warned by the "car turns" sign that the car is about to turn

A BANNER displayed in one of the buildings of the Louisville Railway reads: "Our safety ambition —to be the safest railway in America." It hangs in the hall where the company holds a dinner every month, at which the guests are the transportation employees having the best safety records during that month. This slogan, followed consistently and continuously, has won for the company the 1927 Brady medal for the best record in safety companies in its class, that is, to those operating more than 5,000,000 vehicle-miles during the year ended Dec. 31, 1926.

While officials of the company do not believe that safety is primarily a matter of equipment, they realize that good men with good tools can accomplish more than good men with poor tools. For this reason a great deal of thought has always been given to improved equipment and appliances which promise to reduce the number of the company's accidents. Several especially novel innovations were tried out during 1926. Among these may be mentioned "car turn" signs; the construction of additional safety zones and the shortening of the car lifeguards.

The "car turn" signs, of which one is illustrated, were installed at locations where experience had shown automobiles trying to pass on the right frequently hit street cars when the latter were making right-hand turns. The required equipment includes a red projector, a floodlighted sign, fitting and clearing contactors in the trolley wire, and a relay in a box mounted on a pole. When used with a Cheatham switch, the same operation of the car under the Cheatham contactor that throws the switch point before the diverging loop shunts out a relay in the normally closed circuit. This causes its armature to drop to a back contact, closing a circuit to illuminate the red projector and to floodlight a sign reading "car turns." The projector is equipped with a 50-watt lamp in a 9-in. parabolic glass reflector with red covered glass, the whole supplying a light that is brilliant even in daytime. The floodlight also has a 50-watt lamp in series with the projector. After the car has turned it passes under a normally open contactor of the short type, which picks up the "stick" relay again and thus removes the indication. This display of signals not only gives a warning, but explains the reason for it. The installation of these signs has greatly reduced accidents of this kind.

Forty-nine safety zone markers were installed on Broadway, the main artery for automobile traffic from the eastern and western sections of Louisville to the center of the city. The Louisville law had prohibited motorists passing standing street cars. This not only tended to delay automobile traffic but there were cases where automobile drivers failed to stop, striking boarding or leaving street car passengers. As the width of the thoroughfare made the establishment of safety zones practicable, several were installed. The zone markers are concrete pillars, roughly 3½x6 ft. in size. They are substantial enough to stop the most reckless driver. Their installation was completed early in 1926. The

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local law was then changed to permit motorists to pass standing street cars. Since the safety zones were installed very few persons intending to board or leave Broadway street cars have been hit.

In addition to these zones eleven loading platforms were built on Broadway. They have a wooden base, roughly 6 in. above the surface of the street, and are 80 ft. long and 4½ ft. wide. At the end toward which traffic is moving on the side of the street where they are located, they are protected by one of the safety zone markers previously described. An iron railing runs the full length of each platform on the side past which traffic is flowing.

As another safety precaution the lifeguards on the cars were cut back so as to keep them in line with the bumper. This was done because police regulations in Louisville permit automobiles to pass street cars on the left. In practice it was found that the driver of many an automobile, in passing a car on the left, had to be in a hurry to get out of the way of traffic bound in the opposite direction and would cut back into his own traffic lane before he was far enough ahead of the street car. The result was that he frequently ran over the lifeguard of the car that he was trying to pass.

Besides this change in the car equipment in the interests of safety, the company has introduced on its cars features to improve sanitation. In a sense, they might properly be included as part of its safety work, as they tend to protect the health of the patrons and employees. The more important of these will be briefly mentioned.

All car ceilings are painted white to give the best light possible. Sanitary hand straps have been installed. Rear concealed vacuum type ventilators have been adopted.

A form of "waste basket" has been installed under the body of each car. The dirt and rubbish on the floor of the car at the end of each run are swept into these baskets rather than on to the ground or deposited in tin cans at line terminals. On safety cars the position of the heaters has been moved forward to give better distribution for both operator and passengers. Wooden strips have been added on the platforms where the motormen and conductors stand, to give them dry footing.

After All, Safety Depends on the Employees

The officials feel, however, that by far the greatest factor in its safety work has been the interest of the employees in it. Seven years ago, or on April 12, 1921, the Louisville Railway Safety Council was organized, as one of the functions of the Louisville Railway Co-operative Association, the association of the employees of the Louisville Railway and its subsidiary companies.

Operating under the safety council, and forming part of it, are twenty local committees, each made up of three men from each carhouse, power station or other unit division of the organization. These local safety committee men, as they are termed, are elected by the men of their units, and serve three months. They wear badges indicating their position. Their duties primarily are to make a thorough inspection of their unit at least once every two weeks, to report on unsafe conditions found, to give personal attention to fire equipment, lighting and sanitary conditions, to conduct safety educational activities and to supervise the instruction of old and new employees in the hazards that apply to their unit. The fact that the term of service is only three months makes it possible over a period of a few years to bring a majority of employees into personal contact with the safety movement through membership on these committees.

Once a month the twenty unit chairmen meet and exchange safety ideas. The company's director of safety presides over these meetings and he is the only officer of the company who takes an active part in the functioning of its safety council.

Once a month an inspection committee, composed of one man representing each kind of work, makes what is known as a monthly inspection trip. This inspection committee consists of a power house man, a track man, a man from the line department, one motorman, one conductor, one man from the shop, one office man, the director of safety, and the secretary of the co-operative association, who also acts as the secretary of the safety council. Without giving advance notice of the time when it may be expected, this committee goes over every piece of the company's property from a safety point of view.

The safety council also takes the lead in arranging safety rallies of different units on the Louisville company's property. These rallies have been found invaluable for arousing the enthusiasm essential to the accomplishment of the company's safety program. As a rule such a rally is held at each unit approximately once in every three months.

These rallies take two forms. One is a very short affair, attended only by the men at a given unit with brief talks by the director of safety or superintendent of transportation. The other kind ordinarily is held at night and is attended not only by the employees but also by their wives and sweethearts. Here there are two or three brief talks on safety, but refreshments are served, generally there is a musical program, and frequently the evening is ended with dancing.

Monthly Accident Contests

The safety work in Louisville is backed up by an appeal to the competitive instinct that is inherent in all men. This appeal has as its main feature a monthly accident contest between the various carhouses on the company's property. A dinner follows as a prize to the men of that carhouse who during the calendar month operate the greatest number of miles per accident. Two dinners really are necessary, one at noon for the men having night runs and one at 7 o'clock in the evening for the men who are on the road in the daytime.

The program followed is designed primarily to entertain the men present, on the theory that it is not necessary to talk safety to men who have won one of these dinners. As a rule there is music, one or two vaudeville acts, a moving picture and a short talk by some prominent guest. To avoid a tendency to rest on its laurels on the part of any carhouse that has won one dinner, the custom was established of permitting the employees of a carhouse able to win a dinner two months in succession to invite wives and sweethearts to the second one.

As interest in the monthly contest grew, the mileage per accident necessary to win a dinner steadily increased. In 1922 and 1923 it was no uncommon thing for a carhouse to win a dinner with an average of 6,000 miles per accident. In November 1926 the carhouse that won the dinner operated 79,651 miles per accident. A change has also been made in the regulations governing the dinner. Now, the men of any carhouse that operates 25,000 miles per accident without winning a contest in any calendar month are invited to that month's prize dinner as special guests.

The company has nine carhouses, and each month the men at each carhouse elect a safety captain to serve during the period of that month's contest. In addition to his other work he virtually acts as a "pep" leader. He does not receive any extra wages, but the company gives the captain whose carhouse wins the accident contest a

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new suit of clothes as a personal prize. Apart from this no bonuses of any kind are paid in connection with safety work on the property.

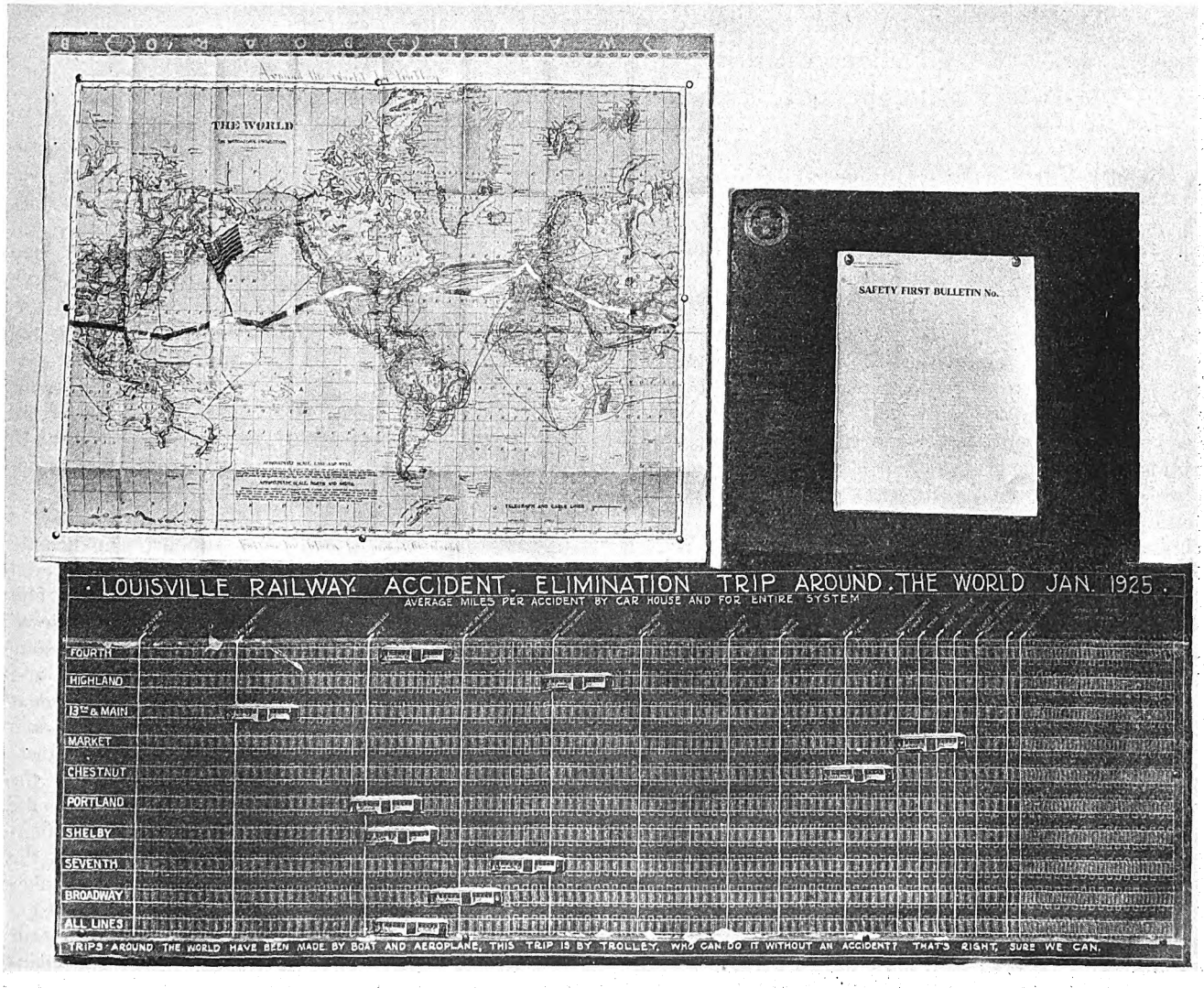
Another feature of the company's safety policy is to vary from time to time the method of indicating the day by day standing of the contestants. This keeps up the interest. A recent method is shown in an accompanying illustration. It is known as the "Around the World Safety Trip." It was originally used in 1925 but was continued well into 1926.

A map of the world, girdled to show the route to be followed, was posted in the carhouse on the theory that any carhouse which operated an average of 25,000 miles per accident would succeed in encircling the globe in safety. Below the map was a blueprint showing the records of the different carhouses, with a representation of a car on each horizontal line to indicate the standing of that division. Bulletins based on the world trip idea were issued during the month to stimulate interest in the contest. Thus one bulletin would say that a carhouse unit "had reached Hong Kong, where great care in operation was necessary on account of dense traffic," or that it had come to Bagdad which was "a long way from home, but if you keep your mind on your business, we can make this trip."

In the fall of 1925 an anonymous director of the company offered an annual cash prize of $75 and a gold medal to the employee who during each calendar year rendered in his individual capacity the most efficient or useful service to the public. To this prize the company added another to go to the same individual of a trip to that year's A.E.R.A. convention.

For 1925 the prize was awarded to a conductor who had expended an enormous amount of energy and his own time upon safety work. For 1926 the prize was given to a motorman who had avoided injury to a child through extraordinary precautions.

A number of other features of the safety program of the company have been worked out carefully, but no attempt is made to enumerate all of them here because of the lack of space. A few words should be said, however, on the results.



A hypothetical trip around the world is conducted monthly to encourage individual carhouses to make at least 25,000 miles per accident

In the first place, the campaign has undoubtedly increased the good will of the people of the city toward the company. They cannot but know about what is going on because of the publicity given to the monthly dinners to the men and to other events. With this good will has come also a greater realization by the public of its obligation to take safety precautions.

There have also been notable reductions in expenditures in settlements for accidents, in spite of increased car mileage and motor vehicle registration. Some of these are shown in a table published in this week's issue on page 148.

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Double-Reduction Motor Drive with Spring Suspension

By C. Bethel
Manager Railway Motor Engineering
Westinghouse Electric & Manufacturing Company

Demands for more rapid and attractive street car service led to the development of the double-reduction gear drive with spring supported motors. Oil-tight gear case is an additional advantage

REMARKABLY quiet operation has been obtained with a double-reduction gearing, known as the W-N drive. It has made possible a maximum gear ratio of 10 to 1, as compared with the ratio of single-reduction gearing of about 3½ to 1. This of course permits the use of a light-weight high-speed motor. Along with this higher speed the motor has been designed to reduce to a minimum the magnetic and windage noises. Since the entire motor weight is spring-borne, the hammer blows at rail joints and on special trackwork are reduced, which also assists in obtaining quietness of operation. When it is considered that today noise is one of the least desirable characteristics of a street car the importance of these features is evident.

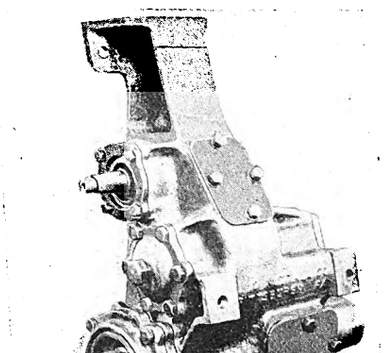
Timken roller bearings are used throughout. With them it is possible to maintain gear centers with accuracy and to ensure that the gears will mesh along the pitch line. Helical gears are used, the face and the helix angle being chosen so that three teeth are always in contact at the pitch line. This insures quietness and freedom from vibration.

A further increase in the gear life is assured by enclosing the gear case so tightly that the gears may be run in an oil bath. This answers the demand of a number of progressive operators, who for a number of years have seen the need for an oil-tight gear case.

The original W-N drive, in experimental form with single-reduction gears, was placed in service in Wheeling, W. Va., in November, 1925. The present W-N drive differs from the original mainly in that double reduction gears are used. This gives a maximum road clearance.

The gear case is a rugged one-piece casting. A split gear case, which would permit more ready assembly of the parts, was not used because it would reduce the stiffness of the gear unit and would add joints that would have to be kept tight. While one of the gears or gear bearings might be removed more quickly were the gear case split, the unit construction requires a less frequent gear removal. The unit can be assembled on an axle without disturbing any of the gears or bearings, and the assembled unit may be put on or taken off the axle just as readily as an ordinary gear.

The entire motor is spring supported, and approximately half of the weight of the gear unit is spring borne. The assembly of truck with motors and gears has an extremely low unsprung weight. The motor is mounted on trunnions and is connected to the gear unit by an extra heavy-duty flexible coupling or universal joint, designed especially for railway service. The trunnions are connected to swing links supported from a member extending from the truck transom to the cross-member behind the wheels.



New Westinghouse W-N drive unit for light-weight, low-floor cars

The gear unit is supported on the axle through two tapered roller bearings and on the other side to the truck transom. Thus the motor and about half of the gear unit are spring suspended. The universal joint and the trunnion swing links provide for the slight movement of the pinion shaft relative to the armature shaft. In addition, the universal joint is flexible torsionally, which gives further protection to the motor and gears from the driving forces. This makes the mounting completely flexible both as to suspension and drive. This is quite important. Most railway motor troubles are either directly mechanical or have a mechanical origin. Such troubles are broken leads, chafed coils, loose coils, worn and broken bearings, poorly meshed gears, gear vibration, chipped and broken brushes, and loose parts. The flexibility of this mounting and drive greatly minimizes the forces tending to cause trouble of this nature.

There has been a definite trend in motor design toward lighter weight. This trend is illustrated in an accompanying graph, where the weight of the motor complete with gear and gear case is plotted against one-hour horsepower. Curve A shows the weight of the old line of split frame motors. Curve B shows the modern box frame, axle hung motors. Curve C shows the new line of motors for W-N drives. A similar set of graphs shows weight plotted against tractive effort at the one hour rating. Table I gives another illustration of the trends in design.

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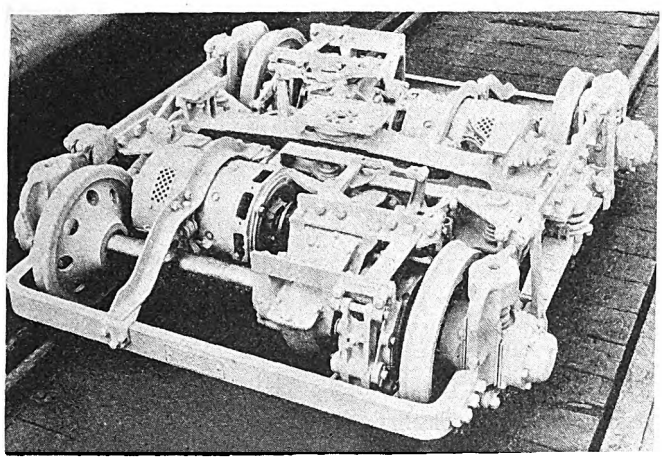


The W-N drive and No. 1425 motor applied to truck of light-weight car

The average weight of representative motors, including gear and gear case, is 67.4 lb. per horsepower for the split frame motors, 42.7 lb. per horsepower for modern box frame motors and 28.3 lb. per horsepower for the W-N drive motors. These compare with the weight of three modern European motors designed for Cardan shaft drives of 31.5 lb. per horsepower without gears, couplings, or driveshaft. The remarkable lightness of the modern W-N drive motors is due to high speeds, improvements in ventilation, class B insulation, and to the use of 300 volts per motor, two motors being connected in series on 600 volts.

An unusual feature of the motors is that they are designed to run two in series on 600 volts. Everyone who has had experience with light-weight, high-speed motors with 600 volts per commutator realizes the advantages of reducing this to only 300 volts. Where the space is restricted and the diameter is small the commutator bars must be very thin when an adequate number for 600 volts are used. The distance between brush-holders is also short. With 300 volts per commutator fewer bars are required and a better mechanical structure results; the volts per inch of periphery are cut in two. Hence flat spots, poor commutation and flashing should be practically eliminated. The use of 300 volts gives a larger motor rating for a given weight and space, and the machine is much more stable electrically and rugged mechanically.

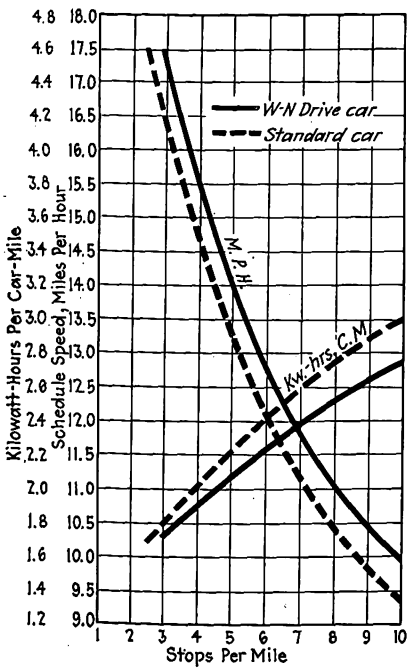
There are several reasons why 300-volt motors of the axle-hung type have not been used. Until recently a fairly large part of the cars purchased had two motor equipments. It was more economical to have a motor to serve for both two- and four-motor equipments. Motor speeds suitable for the standard single reduction gearing are not beyond the range of reasonable 600-volt design, and commutators are large enough to operate safely on 600 volts.

The last two reasons hold for all standard axle-hung motors with the possible exception of the 25-horsepower size, which is just about at the limit of good design from the standpoint of commutation and flashing. In fact, it sometimes has appeared that safe limits have been exceeded.

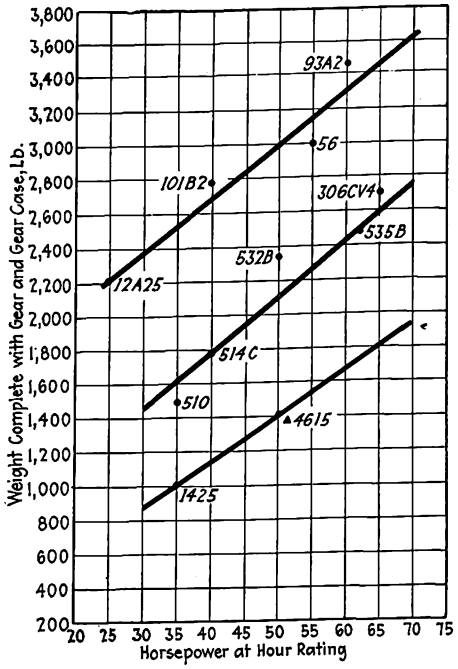
With the development of high ratio gearing for other purposes, efforts were made to take advantage of it in the motor design. Since gear ratios up to 10 to 1 are entirely feasible, this ratio was used as the basis of investigation. It soon developed that it is easy to build a 35-hp. motor that is adequate mechanically to operate at the speeds required for this gear ratio. But it also developed that the commutator of a 35-horsepower motor running at such speeds is smaller even than the commutator for the standard 25-horsepower machine.

The electrical stability of a motor depends on number of commutator bars, volts per inch of commutator, and commutator speed. In a high-speed 600-volt motor either the number of commutator bars must be seriously reduced or the bars made quite thin, and the volts per inch of commutator and the commutator speed are seriously increased. For 300-volt motors the mechanical strength of the armature limits the armature speed. Electrically the 300-volt motor is very stable.

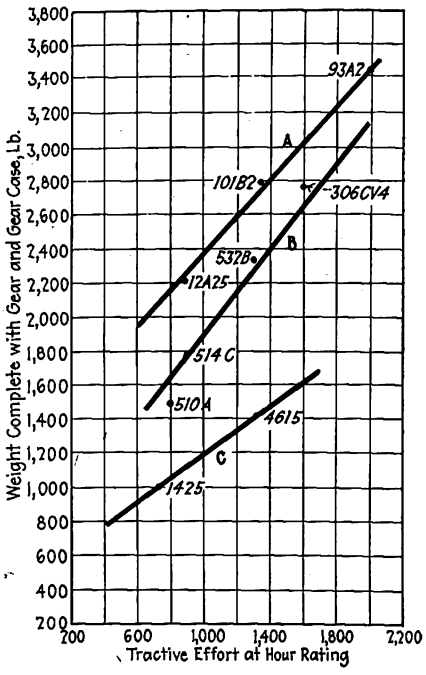
The type 1425, 300-volt motor developed for the W-N drive is insulated for 600 volts. Full line voltage, due to a ground in one of the motors of a pair, or to severe



Operating characteristics of new W-N driven car and standard car



Trend in design of lighter motors per horsepower



Trend in design of lighter motors per pound tractive effort

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wheel slippage may be applied without damage. While such conditions may cause flashing sometimes, it is not the occasional flash that runs up the maintenance. It is the continued flashing of the same motor. Furthermore, there is a great difference in the effect of a flash on a 300-volt motor as compared with a 600-volt motor. The small, high-speed 600-volt motor is very sensitive to flashing and the commutation is none too good. When a flash occurs the commutator may be roughened slightly. Owing to the inherent instability this provokes one flash after another, until a definite flat spot is started. Once a flat spot is developed the only cure is to turn the commutator.

When a flash occurs in the 300-volt motor any slight burning of the commutator is not nearly as likely to cause another flash because of the inherent stability of the motor. The commutator has a fair chance to take on a polish and free itself of further danger of flashing. The 300-volt motor is, therefore, much less subject to flashing, but the flashes that do occur are not nearly as likely to result in a repair job as a flash on a small high-speed 600-volt motor.

The conductors of 300-volt motors are twice the size of those of corresponding 600-volt motors, providing a more substantial armature winding and affording better seats for the bands. The problem of broken leads is less serious with the larger conductors. The substantial armature construction and improved commutator design permit of high peripheral speed. In the smaller sizes the 300-volt motor permits a more economical use of materials. Other things being equal, the 300-volt motor is lighter than the 600-volt motor.

The successful operation of the Springfield and Joliet cars with two Westinghouse motors in series on 600 volts, and the high accelerating rates obtained in the tests of the car with W-N drive, indicate a freedom from slipping of wheels. Similar successful results with 600 and 750-volt motors in series on 1,200 and 1,500 volts confirm the same thing.

TABLE I—WEIGHTS PER HORSEPOWER FOR VARIOUS MOTORS

Type	Horsepower	Volts	R.P.M.	Weight Complete With Gears and Gear Case	Pounds per Horsepower
12-A-25	25	500	515	2,200	88.2
101-B-2	40	500	520	2,780	69.5
56	55	500	500	3,000	54.7
93-A-2	60	500	510	3,440	57.3
510-E	35	600	1,070	1,475	42.2
532-B	50	600	665	2,325	46.5
535-A	60	600	770	2,400	40.0
306-CV-4	65	600	700	2,750	42.3
1425	35	300	2,100	1,000	28.6
1426	50	300	1,650	1,400	28.0
S.S. D340	50	550	1,300	1,320*	26.4*
A E G	45		820	1,650*	36.6*
Paris	50	550	800	1,584*	31.7*

* These weights do not include gear and gear case.

European Experience Valuable

While railway problems in Europe differ materially from those met with in this country, certain aspects of European experience furnish a valuable guide for American development of new street car drives. Various kinds of street car drives have been experimented with in Europe for the last six or seven years. The motors used do not differ materially in weight efficiency from those of the standard axle-hung type used in this country. The average weight of representative motors, without gear and gear case, is 38.1 lb. per horsepower for domestic box-frame motors, 31.5 lb. per horsepower for European Cardan drive motors, and 15.5 lb. per horsepower for the W-N drive motors.

The principal reason for this great difference in motor weight is the almost universal use of two-motor equipments in Europe. This compels the use of 600-volt motors. One prominent European manufacturer states that full advantage cannot be taken of the higher gear ratios possible with the new drives because of the limitations of 600-volt design. In spite of this the new types of gear drives have made great progress in Europe. The most common type is the bevel gear drive developed in Paris. More than 500 cars equipped with this drive are in service. There also are a number of double reduction spur and bevel gear drives, some double reduction spur gear drives, and a few worm drives in service in Europe.

Use of the single-truck car has also influenced the gear drives used in Europe. Practically all of them are connected to the motor through a Cardan shaft perpendicular to the axle, so that the designer can place the motor where there is the most room for it. It would be quite difficult to place the large motors used parallel to the axle similar to the mounting with the W-N drive.

The principal reason for the development of these new drives in Europe is to reduce maintenance cost. Gears mounted in oil and dirt-tight gear cases have a much longer life than with the old type of mounting. These drives permit the motors to be spring suspended, which reduces the motor maintenance. No great reductions in dead weight have been made. It appears that no special emphasis has been placed on noise reduction, perhaps because in Europe the old cars were much quieter than cars in this country.

Ability to maintain high schedule speeds is of greatest importance. High accelerating and braking rates are the principal factors in obtaining this end. Ample capacity of electrical equipment for the weight of car handled is essential if high maintenance expense is to be avoided. The type 1425 motor with W-N drive on a car loaded to 33,000 lb. made very unusual records of accelerating and braking. Rates of 3 m.p.h. per second were obtained without difficulty and several values of between 4 and 5 m.p.h. per second were recorded during the tests. Paraphrasing the automobile advertisements, the average car will not be expected to make these rates in every-day service, but the ability to perform is present and may be called on in emergency. These high accelerating rates are possible because of the high efficiency of the drive and the ample motor capacity.

Another factor which assists in maintaining high schedule speeds is ease of passenger interchange. Low floors are most important to facilitate the boarding and alighting of passengers. The type 1425 motor with W-N drive allows 22 in. wheels to be used with 1 in. greater clearance than was formerly obtained with 26-in. wheels. This permits a low car floor with only two steps of moderate height from the ground, without ramps, which increase the cost of a car and are an accident hazard. The low floor also adds to the beauty and attractiveness of the car body.

Low Operating Cost Indicated

Operating costs should be decreased with the new type of equipment. It is light in weight, the starting resistance is low, the gears are efficient. All these factors result in low energy consumption. High schedule speeds make it possible to give a specified service with fewer cars, and at reduced labor costs and fixed charges per car mile. Maintenance costs should be low because of the low unsprung weight, the simplicity of the equipment and operation of the gears in a bath of oil from which foreign matter is excluded.

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Philadelphia Tackles Its
Street Congestion Problem

Extensive publicity campaign carried on by Philadelphia Rapid Transit Company during November and December brought public appreciation of the real causes of traffic congestion and consequent delays. Elimination of taxi cruising a major accomplishment

"GIVE the 80 per cent a square deal" has been ringing through the highways and byways of Philadelphia during the late fall and early winter. Signs in the street cars, advertising spreads in the newspapers, speakers before civic associations, thousands of direct-mail contacts with automobile owners and other citizens—all of these media and more have been employed by the Philadelphia Rapid Transit Company to bring home to its passengers and to other users of the streets, the crying need for relief from traffic congestion.

Every large American city has its case of downtown congestion, with principal and minor traffic arteries "hardening" in a manner alarming both to patient and to the experts in attendance. But nowhere is the problem more serious than in central Philadelphia, where the arteries are so narrow as scarcely to be more than capillaries. Almost universal one-way operation throughout the downtown section was adopted many years ago; parking has been prohibited on many of the more narrow streets, yet today the P.R.T. is finding it increasingly difficult to get its cars through the down-town sections of the city on schedules even approaching those of a few years past.

To follow this trend to its logical conclusion would be to invite utter stagnation of all traffic, whether it be on rails, on rubber, or trailing behind old Dobbin. Those who have studied the traffic situation in Philadelphia, and indeed anywhere, realize that there is no real cure for congestion, save by providing vastly augmented highways and street space, by placing surface street car lines underground and, in general, spending great sums of money for sweeping engineering developments. Even then, the surface might soon be as crowded as before.

It is one thing grandly to suggest such moves as these; it is another thing to carry them out. Time, money and public education are required. In the meantime something in the nature of an antidote must be given the patient, if he is to live for future diagnosis. That antidote, as conceived by the P.R.T. and recommended to the people of Philadelphia by widespread publicity and advertising activity, is greater care in the use of the streets. The campaign is not one for bigger and better laws, or for more rigid enforcement of those already in existence. It is rather an appeal to the common sense of all classes of street users. It is of no avail to tell the automobilist that he should not expect to park on narrow streets and that he should not drive on the street car tracks, unless he can be shown that those selfsame tactics delay himself and his fellows every time he sits behind his steering wheel.

Cartoons like this in the "P.R.T. Co-operator" helped to carry the message over

P.R.T. has arisen as the champion of the car-rider—the fellow who, as a composite whole, is numerically entitled to 80 per cent of all the street space, yet is grudgingly accorded about 10 per cent of the space by the privately owned and commercial vehicles which monopolize the balance of the space available.

Action Not Entirely Unselfish

Perfectly true that the transportation company is serving its own ends by focusing public attention upon the traffic problem. Dislocated schedules always make the red-ink bottle perk up with anticipation. Delayed cars mean disgruntled passengers and these individuals cause thinning locks in the public relations department. The local newspapers, in commenting upon the "80 per cent" campaign, have cheerfully pointed out that the P.R.T. has a weather eye cocked leeward during all of its

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vocalizings and visualizings for the benefit of the people. They have none the less been unanimous in supporting the campaign as a worth-while civic movement, regardless of how interested or disinterested may have been the motives which inspired it.

The 80 per cent of street users who are car riders in Philadelphia are, like all majorities, inarticulate except in rare instances when something succeeds in awakening a group consciousness among them. Lest this something be a super-demagogue, inspiring the public to blind and unreasoning attacks upon the transit company, P.R.T. has felt the money well spent in laying its cards frankly upon the table and explaining just how, when and why delays in service are caused.

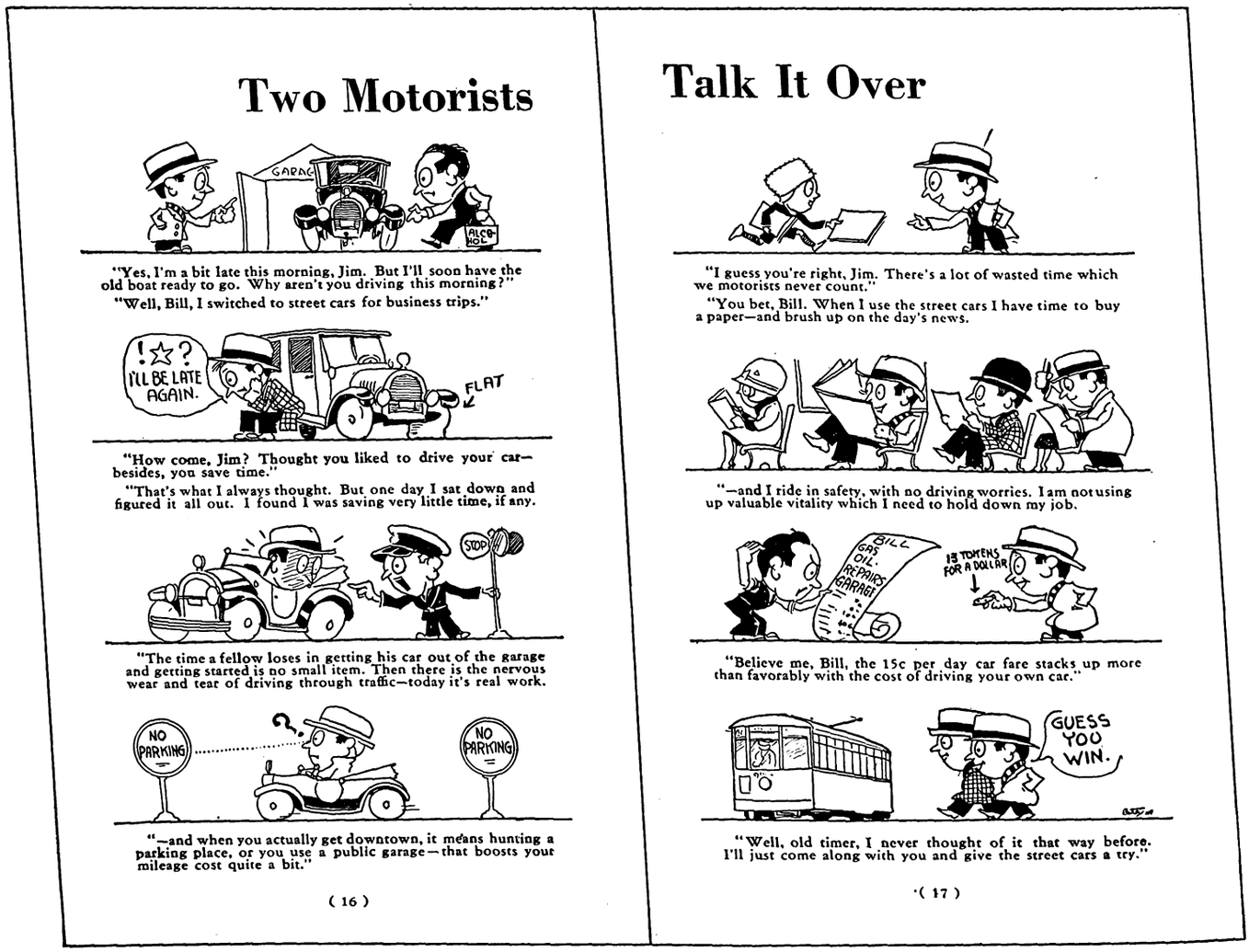
This slogan in a circle was carried in all advertising and on the cars and buses

At no time throughout the year is there greater need for a sympathetic understanding between agencies of public transportation and their patrons than during the month and a half just preceding Christmas. The ideal Christmas presents seem more difficult than ever to locate, their cost is all out of reason, the crowds are impossible, nerves become badly bent, even if they do not break, and then the street car gets caught in a traffic jam down the street somewhere and Mr. and Mrs. Shopper stand on the street corner with a realistic picture of a cold supper forming in their minds.

This season P.R.T. was more fortunate than in the preceding year, for no serious snowfall occurred during the peak of the Christmas rush. In 1926 every delay in service was charged to the company, and an agitation developed which eventually led to an investigation by the Pennsylvania Public Service Commission. The result of that investigation was to give the company a clean bill of health and to fix the responsibility squarely upon the bad traffic conditions existing in the city.

The memory of the public is short-lived, however, and so it was that the slogan, "Give the 80 per cent a square deal," was created. Entirely aside from its practical results in helping to minimize some of the causes of street delays, it has brought home to the car rider that the problems of the transportation company are his own problems as well. As a result, practically no charges have been voiced this season to the effect that P.R.T. has deliberately allowed its service to become impaired, for whatever reason. Rather, the efforts of the company toward clearer streets have met with universal commendation and public-spirited organizations throughout the city have not been slow to go on record as being thoroughly in accord with its aims and purposes.

Experience with previous campaigns had shown P.R.T. that the degree of success attained would depend almost wholly on the extent to which a single key phrase or thought could be instilled into the public consciousness.



The 17-page pamphlet "Thoughts from the 80 per cent to the motorist," distributed generally, carried this effective story

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Hence the "80 per cent" idea was selected. It was woven into every message presented through the newspapers, on the cars or by word of mouth, from the opening broadside early in November up to the present time. It is expected that the campaign will continue to the end of January.

As a result of this publicity the car riders began to sit up and take notice, realizing perhaps for the first time just how numerically important a group of street users they actually were. After a few weeks a man in the street could be heard bringing "the 80 per cent" into his conversations at frequent intervals. Then the quipsters and columnists took the phrase to their respective bosoms and the success of the campaign was assured beyond peradventure.

Important among the appeals to enlist the citizenry of Philadelphia in the movement to reduce street congestion were the following:

A series of advertising messages which were given staggered insertions in all of the large daily newspapers.

"Read-as-you-ride" folders which were given system-wide distribution in boxes provided on the street cars, buses, elevated trains and stations and in the yellow cabs operated by P.R.T.

Dash, bulkhead, ceiling rack signs and cab cards displayed throughtout the system.

Advertisements with special community appeals inserted in the small community newspapers scattered throughout the city.

Direct mail and personal appeals to civic associations to enlist their active support in the campaign.

A special booklet entitled "Thoughts From the 80 Per Cent to the Motorist," distributed to every registered automobile owner in Philadelphia.

Press releases sent to city and community papers, supplementing the advertising insertions and covering such subjects as the actual causes of delays in street car service during the month of November, the particular causes of traffic delays on routes serving specific communities, etc.

From the illustrations which accompany this article it may be seen that the appeal was directed principally in two directions. In other words, both the 80 per cent and the 20 per cent of street users were asked to bend their own effort toward greater freedom of traffic movement. It was pointed out to the car rider that he, himself is not guiltless in the matter of causing needless delays, since his ramblings as a pedestrian and his peccadilloes as a passenger have been known to cause no small amount of confusion upon many occasions. Yet the greatest responsibility for making a wise and effective use of the streets must be placed squarely up to the autoists, fleet owners, and other persons whose vehicles enter the downtown section.

One of the pamphlets given city-wide distribution contained a number of sketches showing a few of the more common causes of street tie-ups. Among these were all-day parking, unloading coal wagons, motor accidents, snowstorms, construction work, accidents, synchronized traffic control, unloading trucks and delivery wagons, and railroad crossings. Quite obviously it would be futile even to hope wholly to eliminate these particular bugaboos from the picture. But it was the plea of the transportation company that the various items be considered in a light of reasonable common sense, with a view to minimizing their effect upon the flow of traffic.

For example, the heads of Philadelphia's large coal supply companies were asked to consider the possibilities of making all downtown coal deliveries in other than peak traffic hours. Merchants with large delivery fleets were similarly requested to co-operate in the prevention of tie-ups due to the downtown parking of their vehicles.

As an earnest of P.R.T.'s own sincerity in the campaign, explicit instructions were issued to the drivers of all cabs and buses operated by the company to the effect that driving on the street car tracks, except when absolutely essential, would be strictly taboo. Employees of the transit company proved more than willing to co-operate in the movement, particularly after a special issue of their employee organ, the *P.R.T. Co-operator,* had explained in detail the purpose and aims of the traffic campaign.

P.R.T. gave the further assurance that all track construction and repair work in the central congested area would be carried on during the night hours, except in cases of emergency. But this was by no means the greatest contribution made by the company to the cause of traffic relief.

No-Cruising Plan for Cabs Was a Major Step in the Campaign

On Dec. 12 the first no-cruising plan for taxicab operation to be adopted in any American city, was initiated in Philadelphia. Under its provisions the various cab companies in the city agreed to prohibit all cruising for fares in the downtown district. Many additional cab stands were provided throughout the central area, there being, as a general rule, a stand behind every trolley stop. The two smaller cab companies were purchased by the Yellow Cab Company, owned and operated by the P.R.T. This left but two major cab organizations in the field, Yellow and Quaker City.

One of a series of newspaper advertisements telling the story

It was agreed that all cab stands should be open to any cab operators, including independents, having a certificate of convenience by the Public Service Commission. Telephones are provided at most of the stands, for the use of Yellow and Quaker City dispatchers in controlling the movements of their respective fleets and also for the convenience of prospective cab passengers who may desire to summon a cab when one is not present at the stand.

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The no-cruising plan, unique in every aspect, was developed after months of careful consideration by a committee appointed by the Public Service Commission and representing the various cab operators in the city. Its purpose, of course, was to do away with that fertile source of traffic congestion, the cruising cab. Incidentally it was expected that the reduction in "dead mileage" on the part of cabs in the downtown section would effect a very real economy in operation for the larger fleets.

Coming at the time it did, the no-cruising plan dovetailed perfectly with the "80 per cent" campaign of P.R.T. and was the greatest single contribution of that organization to the civic movement which it was sponsoring. After an initial period of a few weeks, during which time the various wrinkles of the undertaking were ironed out and the cab-riding public educated to the necessity for "walking half a block for a cab," the plan seemed destined for unqualified success.

Co-operation from Civic and Industrial Organizations

A large number of civic associations, business men's organizations and similar groups passed resolutions commending the "80 per cent" campaign and urging upon city authorities, public utilities, autoists, fleet owners and other persons vitally concerned with the problem of traffic congestion, a careful study and wholehearted co-operation with the movement. The Westinghouse Electric & Manufacturing Company gave valued assistance by placing two of its institutional traffic congestion advertisements in Philadelphia papers during the course of the campaign.

Many fleet owners and others whose aid was solicited by direct mail appeals and by personal contacts responded in gratifying fashion and promised to tackle the traffic problem squarely, so far as their own activities were concerned. The essential logic of the proposition as pictured by the transit company appealed to common sense of other individuals and groups concerned, they being able to realize the economic loss which they themselves are suffering from ever-increasing street delays.

As a result of its experience with this most recent advertising and publicity campaign the Philadelphia Rapid Transit Company is more firmly convinced than ever that institutional and good-will advertising should embody features which reasonably may be expected to effect a saving in operating expense or an increase in earnings. The result in the present case, of course, is to speed up service through the reduction of costly operating delays.

When, as in the case of the "80 per cent" campaign and that of the "Will Livelong" safety campaign conducted by P.R.T. in the spring of 1927, good will may be built up simultaneously with a dollars-and-cents return from a reduction in operating delays or a saving in damage suits, the advertising appropriation is felt to have attained its maximum of usefulness.

Flat Car-Trailer Equipment Successful on South Shore Line

PRELIMINARY reports indicate that the flat car trailer equipment recently added to the merchandise dispatch service of the Chicago, South Shore & South Bend Railroad, Michigan City, Ind., have proved a marked success. Adopting the plan of its sister road, the Chicago, North Shore & Milwaukee Railroad, which was the first electric interurban line in the country to establish this type of door-to-door freight service, the South Shore Line is now operating between Kensington, Ill., and South Bend, Ind., three steel flat cars, accommodating three 15-ton truck trailers each. Three heavy-duty tractors are being used to haul the trailers from the company's various receiving depots in Chicago to Kensington and from all sections of South Bend to the local terminal yards where the trailers, with wheels still attached, are lifted bodily on to the flat cars. Overnight delivery is promised to users of this service, which is now offered only between the two terminals.

Work at the new South Bend freight station of the South Shore Line, which will be used to receive and distribute merchandise dispatch, is expected to be completed early in February. The new depot will be a steel and wood structure, 28 ft. x 120 ft., with a 9-ft. loading platform and complete freight office facilities.

Electric Railways to Climb the Pyrenees

CONSTRUCTION of an electric railroad between France and Spain across and through the Pyrenees Mountains is now under way. This line will connect the Midi Railroad of southern France and the Spanish railroad system that joins Barcelona with Madrid and other important cities. The electrified Midi Railroad runs through the southern part of France, sending branch lines to the northern edge of the Pyrenees Mountains. On the Spanish side are railroads with branches that approach the range, but go no farther toward France.

One of the plans which has been brought to the stage of construction is to connect Toulouse with Barcelona in a fairly direct route. Farther to the west a line is being built from Pau on the Midi to Jaca, the terminus of a Branch line Spanish railroad. The French part of the Pau-Jaca line will be electrified because of the numerous tunnels, the curves of approximately 650-ft. radius and the almost continuous grade of 4.3 per cent. The electrification will be divided into two sections, one from Pau to Bedous, the other from Bedous to Canfranc. The first section has been completed, but is operated as a steam road at present. Power for this section will be furnished by three substations equipped with 750 kw., 1,575-volt, direct-current sets, each set comprising two rotary converters in series.

The second section has two substations, in each of which are to be two 2,000-kw. sets, consisting of two rotary converters in series. These machines, which were built by the French Thomson-Houston Company, are compound excited with a special winding to allow regeneration by the locomotives. This winding modifies the characteristics of the machine in reverse operation and permits the regeneration of energy with but a small increase of voltage at the substation bus. The rotaries will be capable of 50 per cent overload for two hours. The two substations will be fed by three-phase, 50-cycle, 6,000-volt power from the central station of the Société d'Energie Electrique de la Vallée d'Aspe.

For centuries the high wall of the Pyrenees has stood between France and Spain, discouraging intercourse between them. Only where the Pyrenees fall off at the seaboard can railroads pass without difficult problems of engineering. More direct routes between the important cities have been sought and many years of study have been given to the subject.

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Third Avenue System Prepares for

Bus Service in New York

Contracts have been signed for the operation of twelve routes, covering the Borough of the Bronx. With the old routes of the same company this will make more than 100 miles of bus lines. Orders are placed for 104 buses of several types

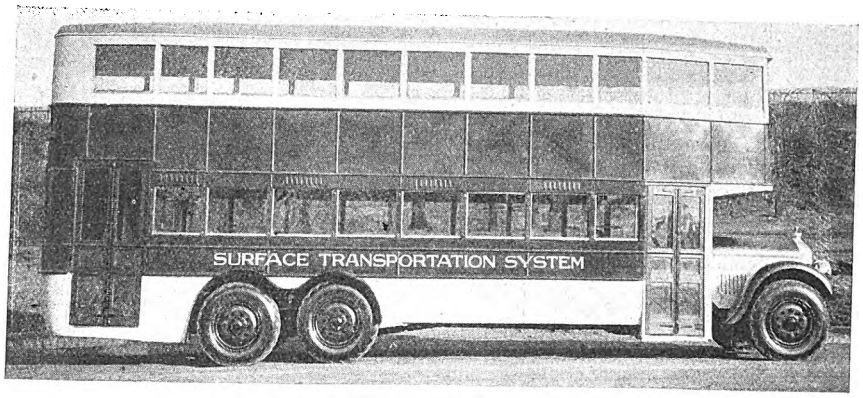
IN CONJUNCTION with the approval by the Board of Estimate and Apportionment of New York City of plans and specifications for buses to be operated in the Borough of the Bronx by the Surface Transportation Corporation of New York, President S. W. Huff of the Third Avenue Railway System, with which the bus company is affiliated, has announced the company's plans for bus service under the franchise award.

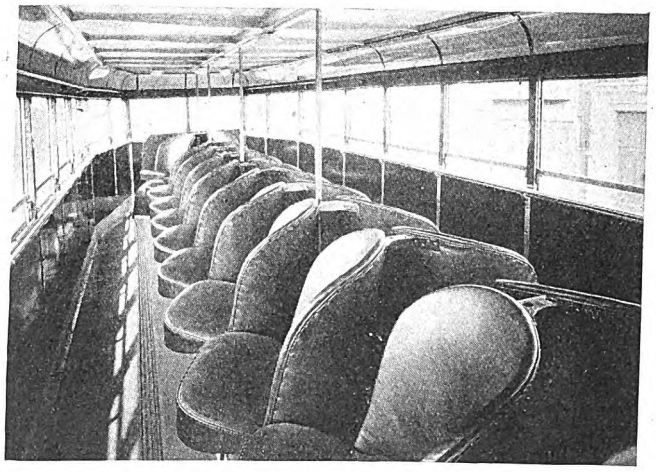
More than $1,000,000 will be expended on four different types of buses required to meet the needs of the borough. Contracts have been made with the Six-Wheel Company, calling for 26 double-deck, and 36 single-deck buses of the six-wheel type; with the Versare Corporation for 28 six-wheel gas-electric buses of the single-deck type; and with the American Car & Foundry Motors Company, for 14 single-deck buses of the dual-wheel type. The work of manufacturing these buses is already under way, and they will be put in service as delivery is made.

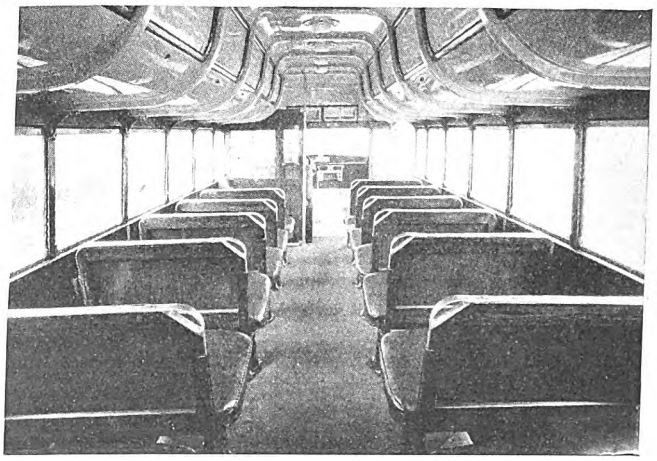
With the inauguration of service by the Surface Transportation Corporation in the Bronx, more than 100 miles of bus routes will have been added to the Third Avenue Railway System. The system has acquired and is already operating nearly 50 miles of bus routes in Westchester County, including the White Plains-Yonkers line, the Harrison-Rye Beach line, the Mamaroneck Avenue line, the White Plains-Tuckahoe line, the Silver Lake line, White Plains-Hastings line, and White Plains-Grassland line. The new Bronx lines will add 55 route-miles to the system.

Plans for garage and shop facilities to take care of the new fleet of buses are under way. Equipment of a large repair shop has already been started on company property on West Farms Road near 172nd Street. All maintenance and repair work will be done at this location. Actual operation will be out of two garages, one on the east side of the Bronx and one on the west side. The east side garage, recently purchased, is situated at 173rd Street and West Farms Road. The details of working out an operating force are also well under way, drivers, conductors, and a maintenance force now being in training.

Fare on all lines will be 5 cents with universal free transfers between all bus lines, with the exception of the two Concourse lines, where there will be two 5-cent







Type of double-deck buses for the Third Avenue Railway System. The middle view shows the seating arrangement on the upper deck and the bottom one the seating on the lower deck

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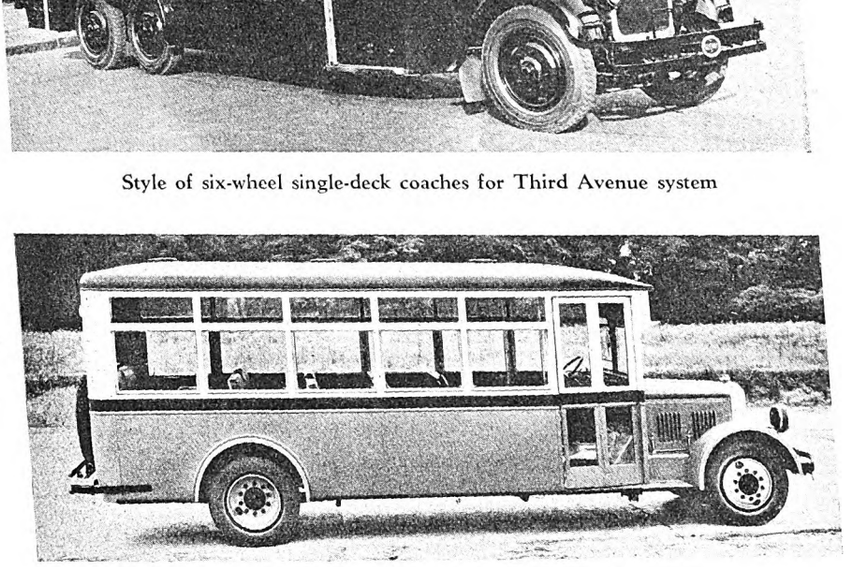
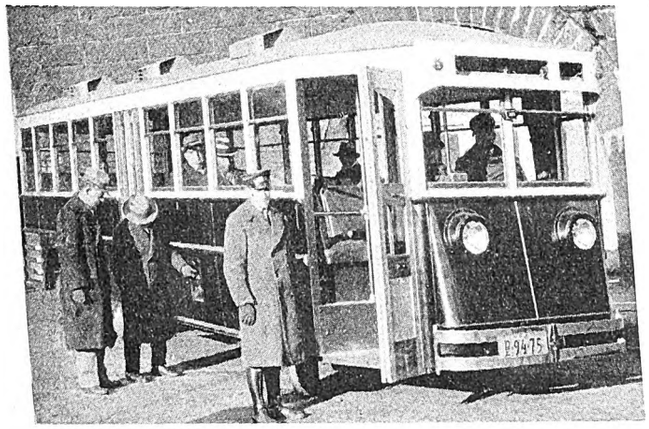
Style of six-wheel single-deck coaches for Third Avenue system



Type of dual-wheel coaches for Third Avenue system



Vice-President William E. Thompson and other Third Avenue men inspecting Versare bus at the railway's offices

zones, and the two City Island lines, on which there will be three 5-cent zones.

According to Mr. Huff, the types of buses contracted for were selected after careful study as best adapted for modern, safe and efficient metropolitan service. All the bodies are of special design, and comprise many features that have never appeared before in urban service in this territory. The six-wheel type of bus, while new to New York urban operation, has been thoroughly tested and is in general operation in other cities, notably Detroit, Cleveland, Kansas City, St. Louis and Akron. All the coaches will be equipped with powerful six-cylinder engines and pneumatic tires.

The double-deck coaches will be equipped with comfortable seats with springs and real leather upholstering. The lower decks will be equipped with double seats and the upper decks with individual opera seats, as shown in one of the illustrations. The upper decks will be entirely inclosed when weather conditions require, and in summer wide windows will be lowered, giving the same effect as an open top. Heating systems will keep both upper and lower decks comfortable during the colder periods. Other features include dome lights on both decks, white enameled ceilings, and walnut trim with upholstery to match. By depression of the sides of the lower deck roof, full headroom is provided in the aisle on both decks.

An important safety feature of the six-wheel single deck buses is the automatic treadle step, which is being employed for the first time in the East. Passengers board at a front entrance and alight at the rear, insuring a free flow through the bus. The treadle step only operates when the buses are at a standstill with the brakes on.

The Third Avenue paint scheme of cream and red will be used throughout the system.

The several types of buses were selected after careful study with special reference to the service which they will be called on to perform. The Concourse, which is one of the principal north-and-south boulevards in the

Route	Name	Termini	Miles
1	Concourse—138th Street	Mosholu Parkway and Grand Concourse, East 138th Street and Mott Avenue	4.9
2	Concourse—Hub	Fort Independence Street and Sedgwick Avenue, East 150th Street and Melrose Avenue	5.7
3	Prospect Avenue	Fordham Road and Third Avenue, East 148th Street and Third Avenue	5.2†
4	Jerome—Bainbridge Avenues	New York City Line at Van Cortlandt Park Avenue, Jerome Avenue and Fordham Road	4.1
5	City Island—West Farms	Boston Road and East Tremont Avenue (West Farms Square), End of City Island Avenue at Belden Point, City Island	7.5
6	Throggs Neck	West Chester Square (Junction of Westchester Avenue and East Tremont Avenue), Fort Schuyler, at the Foot of Pennyfield Avenue	4.4*
7	Boston Road	Dyre Avenue and Boston Road, White Plains Avenue and Bronx and Pelham Parkway	2.6
8	Williamsbridge Road	White Plains Road and Williamsbridge Road (Burke Avenue Subway Station), Westchester Avenue and East Tremont Avenue (Westchester Square)	2.6
9	Eastchester Road	White Plains Road and East 225th Street, Westchester Avenue and East Tremont Avenue (Westchester Square)	3.7
10	Riverdale Avenue	North City Line at Riverdale Avenue, At or about West 231st Street and Broadway	3.4
11	170th Street Crosstown	Southern Boulevard and Freeman Street, St. Nicholas Avenue and West 181st Street	3.5
12	City Island—Fordham	Jerome Avenue and Fordham Road, End of City Island Avenue at Belden Point, City Island	8.0

† Including Branch Line Southern Terminal of Jackson Avenue and 138th Street.
* Including Branch Line along Eastern Boulevard between East Tremont Avenue and Westchester Avenue (Pelham Bay Park Subway Station).

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Bronx, is comparable with Fifth Avenue in Manhattan. For this reason the double-deck bus was selected, and the 26 buses of this type on order will be used on Concourse Routes No. 1 and No. 2.

On those lines where the load factor and the traffic were found heaviest, and frequent stops would have to be made, the 37-passenger gas-electric buses will be used on account of their capacity and rapid acceleration. On the lines where the runs are longer and the stops are less frequent the six-wheel 29-passenger mechanical drive buses were considered most appropriate. In the outlying sections which are under process of development the smaller 23-passenger buses will be operated. It was felt that with the wide range of conditions which must be met a single type of bus would not be suitable.

Prior to submitting the proposition for operation of the bus lines to the Board of Estimate and Apportionment the manufacturers and the railway management had agreed on the type of contracts they were willing to sign. The routes, termini and branch lines included in the contracts are given in the accompanying table.

Good Service Can Be Given at Low Cost

Experience in Fort Worth, Tex., shows that improved equipment gave lower operating expenses

GOOD service can be given at low cost. This has again been shown by the Northern Texas Traction Company, operating between Fort Worth and Dallas, Tex. In its Coffin brief last year it presented some figures and charts of operating expenses for the past six years. Since the presentation of that brief the company has forwarded later data for use in this article so that the 1927 data now are brought down to Oct. 1, 1927.

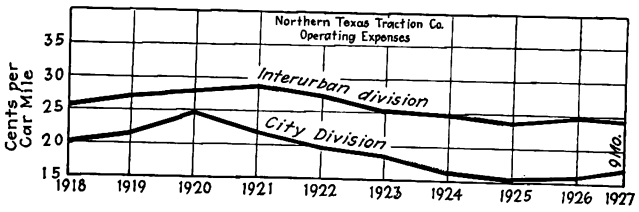
The first chart reproduced shows the operating expenses of the company from 1918 to 1927 inclusive, for both the interurban and city systems. As will be seen there has been a steady drop in expenses on both divisions since 1920.

During the summer of 1926 the company started a campaign for better service, which increased its operating costs slightly but added to its net earnings. It also brought many favorable expressions from the public. On the city division the actual decrease was from 24.6 cents per car-mile in 1920 to 15.9 cents in 1926 and 17.3 cents in 1927. These are decreases of 35.4 per cent and 29.7 per cent respectively.

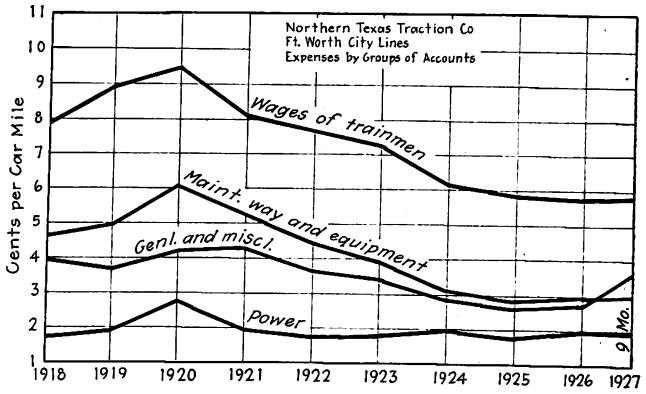
The period since 1920 has been one in which there has been no change in the wage scale. The entire saving through these years has been gained by means of modernization and the use of light-weight equipment. Operating costs have been reduced principally by:

(a) 100 per cent one-man operation on city lines.
(b) More than 80 per cent operation of city lines with light-weight cars.
(c) 13.1 per cent increase in speed of city cars since 1920 and 6.1 per cent since 1925.
(d) Inspection of all cars on mileage basis, with a decrease in cost as the system became perfected.
(e) Installation of labor-saving devices.
(f) Use of natural gas for fuel at the power house and a better form of contract through specification of price according to B.t.u. content.
(g) Modernization of cars and use of latest devices and fixtures.
(h) Education of employees, with resulting improvement in efficiency.

The second chart gives the cost of operating the city division by groups of accounts. It shows that the decline in operating costs since 1920 was consistent through all the groups up to 1927. The decline in trainmen's wages per car-mile continued through the year 1926, due largely to increases in the speed of the city cars, though revision of night schedules and changes on several lines during the day contributed to this low figure. Actually, the decreases were from 9.4 cents per car-mile in 1920 to 5.8 cents in 1926 and 5.85 cents in 1927, or decreases of 38 per cent and 37.6 per cent, respectively. As already explained, there has been no decrease in the wage scale



Nine-year chart of operating expenses on interurban and city division, Northern Texas Traction Company



Nine-year chart of primary operating expense accounts, Fort Worth city division, Northern Texas Traction Company

since 1920 and the company is operating 100 per cent one-man equipment.

Maintenance in 1926 and 1927 has shown a slight increase over the 1925 figure, but is still much lower than in any previous year. The increase over 1925 is caused by the improved service program already mentioned. The decrease per car-mile in this account, as compared with 1920, is 54.4 per cent for 1926 and 49.5 per cent for 1927. It does not indicate that a proper maintenance program has not been carried out, as during 1926, 13.1 per cent of the gross earnings was used for this purpose. The track and cars are considered to be in better shape than at any time in the history of the company.

The cost of power has remained steady since 1924. This is remarkable considering an increase in speed of 8.2 per cent over 1924 and 6.1 per cent over 1925 and an increase in the cost of fuel of 6.1 per cent.

The general and miscellaneous group shows a consistent decrease through 1925. In the latter part of 1926 and during 1927 considerable expense was incurred in establishing the new fare schedule, effective Feb. 7, 1927, in purchasing nickel passes and in several other ways which are not a regular charge to operation. Thus, after increasing its fare rates, the company decided to build up its accident reserve to a figure larger than that of several years past, and for a time prorated 4 per cent of gross to this account. The prorate was then reduced to 3 per cent, since this amount seemed to be sufficient to serve the purpose.

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Maintenance Methods *and* Devices

Handy Sash Painting Stand

OF THE various devices that have been designed for painting window sash none has been found more useful than the rotating table. It has been reduced to its simplest form in the paint shop of the Twin City Rapid Transit Company, St. Paul, Minn., by Joseph Gabler, foreman. The table is formed of a heavy cross-braced plank with rubber blocks at the four corners and two additional rubber blocks mounted in between tor holding smaller sash. These rubber blocks hold a sash firmly in position when it is laid on top of the table, yet it can be lifted off instantly. The table has a length of 1-in. pipe fastened to its under side by an ordinary pipe flange. The standard is a discarded paint barrel, and the support for the pipe, in which the latter rotates, is a wooden block fastened to its top.

With the assistance of the stand the workman can paint all parts of the sash evenly, and there is no difficulty from the paint running over the glass. Since the stand and sash are rotated, the painter does not have to move while he is working, yet he does not have to reach over the sash. The sash can be reversed for painting both sides without the necessity of touching the freshly painted surface.

"Stop, look and listen" as your cars pass, then get busy on their maintenance.

A discarded barrel forms the base for this **rotating sash painting stand**

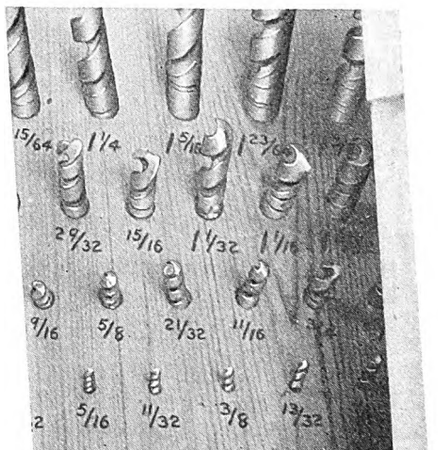
Salt and Sand Spreader

SALT and sand are spread along the bus routes of the Northern Ohio Power & Light Company, Akron, Ohio, with an ingenious spreader which was made in the company's shops. The mechanism is mounted on a Model 50 White chassis, cut down in length. The power take-off for the spreading mechanism is installed on the main transmission, and from the take-off an auxiliary touring car transmission is driven. A driving shaft is run from the latter transmission through standard universal joints to a Ford axle which is mounted vertically. On the lower end of this axle is installed a disk for throwing the salt and on the upper end is a steel wheel for agitating and breaking up the salt in the hopper. The hopper is made of 12-gage steel and has a capacity of 3½ cu.yd.

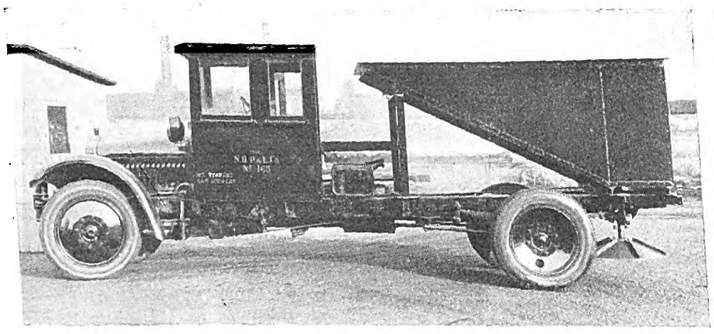
The salt feeds out of the hopper through two holes which are fitted with shutters that can be worked from the cab. By use of the auxiliary transmission any desired speed of the distributing cone can be secured regardless of the car speed.

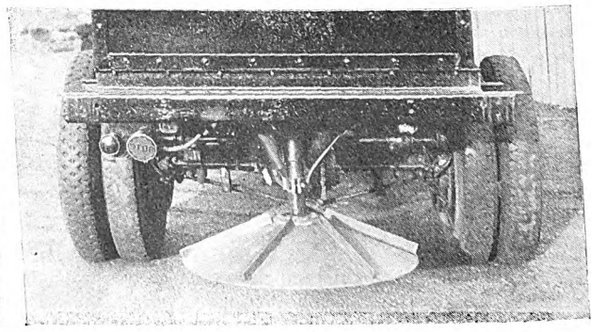
Convenient Cabinet for Drills

BESIDE the drill presses in the Hall Street shops of the Grand Rapids Railway, Grand Rapids, Mich., a wooden cabinet for drills has been constructed. This is 3 ft. wide by 5 ft. high and has sloping shelves, on which the different sizes of drills and taps used in shop work are kept. The doors can be locked so that there is no danger of theft during hours when workmen are not present. Figures underneath the various drills and taps indicate the sizes. This provides a neat arrangement convenient to the drill press.



One of the sloping shelves in the drill cabinet





At left—Truck used for spreading salt and sand on bus routes of Northern Ohio Power & Light Company
At right—Cone mechanism at the rear for spreading the salt or sand

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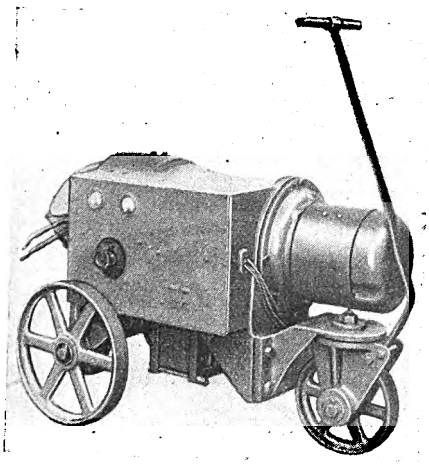
New Equipment Available

Light Portable Welder

RAPID extension of electric welding has made desirable the use of light compact portable welding outfits. To meet this demand the Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., has brought out a new built-in portable welder. The frame is part of the truck and the control panel is built into the framework. The equipment is lighter, smaller and more rugged than previous designs and it has a trifle better electrical performance than other portable sets.



Compact electric welder of built-in type

Metal Railroad Tie Welder

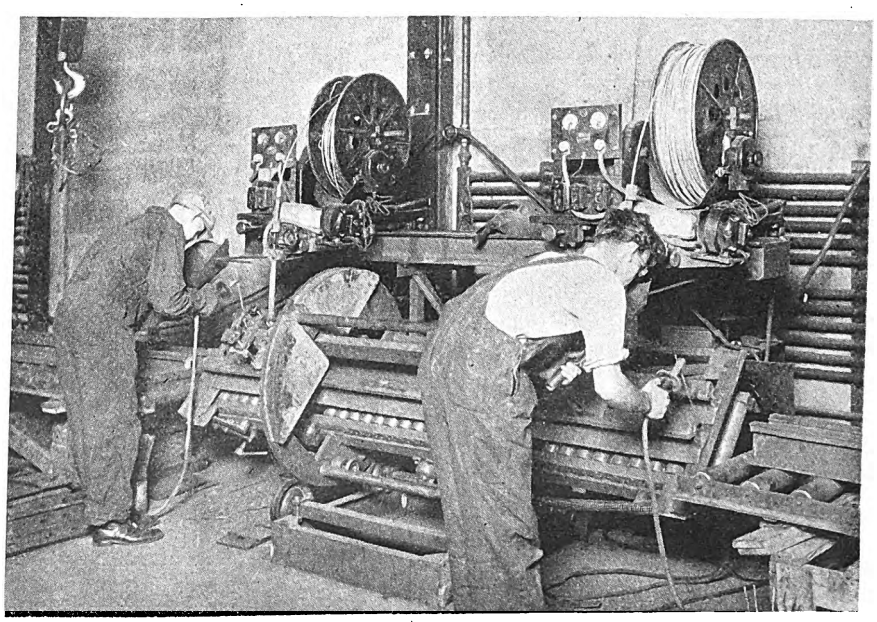
WELDING equipment for making metal railroad ties from scrap rails automatically is announced by the General Electric Company, Schenectady, N. Y. By means of this equipment railroads can make their own metal ties or manufacturers can fabricate them for sale. The new welding apparatus developed for this work consists of an automatic tie-welding machine and a 1,500-amp. motor-generator set with two circuits for hand welding and two circuits for automatic welding.

The equipment includes eight essential parts: (1) A section of a roller conveyor on which the rails are moved into position for welding; (2) a jig for spacing the rails correctly and locating the tie plates on top of the rails; (3) two pneumatic plungers for holding these parts in position rigidly; (4) a pair of spring-and-toggle-operated clamps for holding the angles against the ends of the rails; (5) a mechanism which rotates the whole jig with its rails and plates in either direction a distance of 45 deg. from the perpendicular, permitting automatic welding to be done first on one side of the tie plate and then on the other; (6) two automatic welders mounted on individual travel carriages for welding the two tie plates simultaneously; (7) a track on which the travel carriages ride; (8) a supporting framework.

The rails are inserted into the machine and the tie plates placed in position. The equipment is then held firmly by means of compressed air. The angles are next placed in position, after which the work is rotated to a point where the joints between the plates and one rail may be welded. The first welds are then made automatically, the arcs moving away from each other. The fixture is then rotated to a point where the other joints are beneath the electrode and the welds are made with electrodes moving toward each other.

While the automatic welds are being made the operator attaches the angles to the ends of the rails by hand welding. All welding being completed, the fixture is turned back to normal position and the completed tie removed.

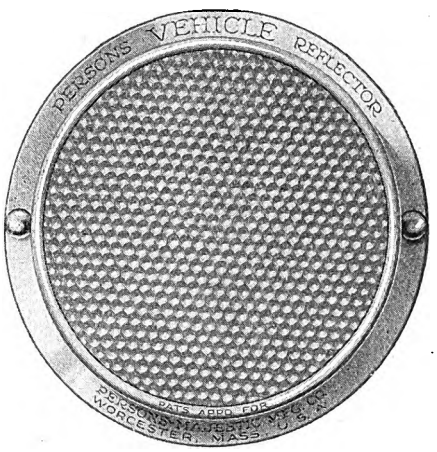
For maximum production the machine requires two operators, one for each of the two automatic heads. Each head has a separate control panel, thus making each operator largely independent of the other. Estimated output of the machine with two operators is one tie every five minutes.



Automatic arc-welding machine for fabricating metal railway ties

Reflectors for Rear Ends of Buses and Trucks

WITH the purpose of reducing rear end collisions at night, the Persons Majestic Manufacturing Company, Worcester, Mass., is marketing a reflector for the rear ends of buses, trucks and other automotive vehicles. The reflectors are made with a red, green, crystal or purple lens and are said to have good visibility on a dark road from ordinary headlights at ranges up to 500 ft. Light is reflected from the double prismatic lens which has an angularity of more than 20 deg. It receives light from the car following and returns it to its source, even though the bus or truck is going around a curve. The reflector has a face of 5 in. diameter.



Reflector for installation on buses

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Association Activities

Service Improvement Occupies Attention of Midwest Association

Additional details of discussion at Hot Springs Convention indicates that railway men in Mid-Western territory are keeping their eyes to the front in the effort to win increased patronage

RAILWAY executives in attendance at the recent meeting of the Midwest Electric Railway Association held on Jan. 16 and 17 at Hot Springs, Ark., a preliminary telegraph report of which was published in last week's issue of the JOURNAL, devoted their attention more to the matter of pushing further forward on the ground already gained in the improvement of electric railway conditions, than to consideration of past difficulties. They talked on "coming out" of receiverships, of the improvement of equipment, track reconstruction programs and the speeding up of railway service. It was most encouraging to observe that their optimistic attitude was amply backed by a serious determination to keep the ball rolling in the right direction; that railway men are more alive than ever to a realization that the newest types of street car design are subject to still further advance; that in fact the work of modernizing mass transportation facilities has only made a promising beginning.

One of the headliners on the program of the convention was C. M. Ballou, City Railway Commissioner of Cleveland, Ohio. In a paper to be abstracted in some detail in a succeeding issue of the JOURNAL he made the point that progress in the railway industry, as in every line of endeavor, comes by one of two processes: one, a gradual change and adjustment to meet new conditions; the other one, revolutionary in character—necessary only in case the former fails or is too long delayed. Reviewing as a specific performance the part played by the City of Cleveland in supplying transportation under the so-called Taylor Grant for a long period of years Mr. Ballou discussed in some detail the development and functioning of the "service-at-cost" principle first established in Cleveland.

As outlined there are but very few fundamental principles in the settlement—in fact only one central idea—"service-at-cost." As foreseen by former Judge Taylor of Cleveland, chief arbitrator in the dispute between the City of Cleveland and the street railway company and the one responsible in a measure for the adoption of the original "service-at-cost" franchise, the determination of a fair valuation remains to this day the chief battleground.

Mr. Ballou laid emphasis on the point that Cleveland has in its franchise a distinct departure from the ordinary type. While it grants the railway company the usual right to occupy city streets and the privilege of operating a street railway system therein, it contains new features which involve a degree of civic responsibility not usually found in street railway franchises. Under a "service-at-cost" franchise there should be, theoretically, no dispute about the amount of service, for if more service is desired, or higher standards of service, it will cost more money and the rate of fare will be raised automatically to take care of the matter.

The natural tendency of the city is to demand an ever higher standard of service—the only check being higher fares. The major part of the discussion in the paper was directed toward indicating an answer to the question as to whether the tendency of the future is going to be toward a greater participation in transportation problems on the part of the city under the type of franchise in effect in Cleveland or result in a greater independence on the part of the street railway company. In the opinion of Mr. Ballou this question will be answered in no small measure by the additions to service which will have to be made at some future date in many communities to take care of the steadily expanding circle of suburban home developments.

In presenting a résumé of the legislative situation at Washington, Leslie Vickers, Economist of the A.E.R.A., touched upon several matters of immediate concern to the electric railway industry. He explained that nothing was to be feared from a senatorial investigation of the utility industry except as such an investigation is allowed to degenerate into an effort to capitalize purely political aspects of the situation. A fair-minded, dispassionately scientific investigation of the industry's business can be viewed with equanimity according to Mr. Vickers. Continuing in his discussion of national legislative matters, he said that the Revenue Act which has already been passed in the House must needs be amended somewhat to include workable provisions for the rendering of returns on jointly-controlled utility properties. He stated that the course of the bill regulating the operation of buses should be followed closely; that the bill as at present drawn commands the approval of all the parties concerned, including the Association of Railway & Utility Commissioners, the street railway companies, railroads, and both independent and railway associated bus companies. The opinion was expressed that the whole transportation act of 1920 needed revision to bring its provisions up to date. In concluding, Mr. Vickers outlined some of the things the national association is trying to accomplish for the electric railway industry at large and explained the functions of the New York and Washington offices of the organization as they concern contact with legislation and other matters of national scope. He pointed out the urgency for local units of the railway industry keeping their states' senators and representatives in Washington properly informed on the problems confronting them on their local properties. Only by this co-operative effort Mr. Vickers showed, could the headquarters' staff of the A.E.R.A. hope to accomplish worthwhile results in its own contacts in Washington.

COMING MEETINGS OF *Electric Railway and Allied Associations*

Jan. 31—**New York Electric Railway Association, midwinter meeting, Hotel Commodore, New York, N. Y.**

Feb. 13-17—**American Institute of Electrical Engineers, winter convention, Engineering Societies Building, 33 West 39th Street, New York, N. Y.**

Feb. 17-18—**Central Electric Railway Accountants' Association, Hotel Gibson, Cincinnati, Ohio.**

March 23—**Maryland Utilities Association, annual meeting, Emerson Hotel, Baltimore, Md.**

May 2-5—**Southwestern Public Service Association, Dallas, Texas.**

May 6-12—**Union Internationale de Tramways, de Chemins de Fer d'Interet Local et de Transports Publics Automobiles, biennial meeting, Rome, Italy.**

June 6-8—**Canadian Electric Railway Association, annual convention and exhibits, Toronto, Canada.**

July 8-12—**Public Utilities Advertising Association and International Advertising Exposition, Detroit, Mich.**

SEPT. 22-28, 1928

American Electric Railway Association, 47th annual convention and exhibit, Cleveland, Ohio.

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Citing as results, attributed in part at least to the plan of building sales instinct in street railway men, the securing of fare increases on Texas railway properties of Stone & Webster without incurring unfavorable public reactions and likewise the cutting almost in half of accident costs, R. C. Forman of Stone & Webster outlined the training methods employed in making railway employees articulate through helping them to acquire the ability to talk intelligently about the company's affairs. He particularly emphasized the fact that the work in public speaking on Stone & Webster properties is not forced on the trainmen. The course of instruction in public speaking has been offered to manager and motorman alike in an effort to get every railway employee wholesomely informed on the affairs of the company for which he works; to make every trainman an intelligent, judicious company representative. Mr. Forman outlined the methods employed in conducting the public speaking instruction and stressed the existence of a real hunger on the part of every man for the ability to talk intelligently before a group of his fellows. In the conduct of the public speaking classes groups of about twenty men are handled at one time. Subject matter is subordinated to the development of the individual. Executives of the company who themselves have taken the course at an earlier date are called into meetings of the classes and address the men on subjects pertaining to their own departments. The department head then leaves the room and the subject of his informal talk is made the occasion for general discussions on the part of those taking the public speaking instruction. So far it has been observed that the men taking the course gain in self-confidence, evolve a keener loyalty to the company born of an understanding of its problems, and finally develop in a gratifying degree into able advocates of their company's policies. Mr. Forman stressed the fact that success of any such program of employee training is dependent upon a sympathetic and fair attitude on the part of the management.

Contrasting industrial conditions prevailing in the United States with those abroad M. B. Wootan, editor of *Public Service* magazine, Chicago, attacked government ownership of industries as essentially un-American, inefficient and uneconomic. He pointed out that the industrial supremacy of this country has depended not so much on our own vast resources of power as upon the retention and unhampered recognition of man's right in man's ideas. He warned that to shackle individual initiative as professional propagandists would seem to be preaching, would be destructive to American principles and progress.

Lantern slides illustrating recently built electric railway cars, and an outline of their principle specifications were presented by C. L. Van Auken, managing editor of *Electric Traction*.

The place of the bus in urban transportation was the subject of an able paper presented by D. E. Druen of Kansas City Public Service Company. Mr. Druen's paper will appear in abstract in a later issue. It was unfortunate as Mr. Druen views it, that the bus made its debut to the street railway industry at a time when that industry was in an unreceptive frame of mind, because the "getting off on the wrong foot" has been a costly experience to both the railway industry and the bus manufacturer.

With T. J. Kelly of Fort Smith, Ark., as leader; S. E. Dillon, Hot Springs; R. B. Campbell, Wichita, Kan.; R. A. Leussler, Omaha, Neb.; F. G. Buffe, Kansas City; B. Hilburn, Tulsa, Okla.; C. J. Griffith, Little Rock, Ark.; J. L. Adams, Denver, Colo.; D. L. Fennell, Kansas City, and others enlivened the luncheon devoted to a discussion of "Transportation Failures" with experiences obtained from operation of their respective properties.

In progress at the same time was a luncheon devoted to a consideration of "Mechanical Problems," W. J. Martin of Miami, Okla., presiding. Car delays from car failures and what several companies have done to reduce interruptions to service in handling them provoked considerable discussion. Mr. Crouse of the Westinghouse Electric & Manufacturing Company presented a short paper detailing some of the mechanical features of modern railway equipment.

The Bus in Urban Transportation*

By D. E. Druen
Superintendent of Bus Maintenance, Kansas City Public Service Company, Kansas City, Mo.

With the advent of the private automobile the riding public developed an entirely new conception of transportation. When a person moves about today this movement must be in accord with or partaking of the spirit, customs or activities of this age. Any agency of city transportation incapable of supplying these qualities, even though it offers safety, comfort and economy, can only hope for mediocre success in the field of city transportation.

The every day hazards to life and limb in city life have made the average citizen indifferent to giving any forethought to his safety. He seems to rely on his ability as a quick thinker and dodger to meet the emergency when it appears. While safety in transportation is an absolute essential as a sales argument, the value of its appeal is questionable.

Comfort in city transportation is being given considerable thought and attention today. I believe that comfort should be measured in terms of its distance from hardship rather than in its approach to luxury. The vast majority of passengers will be more concerned over the length of the time they must sit in a seat than with its luxury.

The well-known ability and willingness of the American public to pay for what it wants has just about shelved that old argument based on the big difference in cost between private and public transportation.

When considering buses it must be remembered that they are a product of this age and are rapidly becoming an intimate part of city life. The bus is a full blood relative of the private automobile and, as such, what is more reasonable than to expect it capable of exciting in its passengers reactions similar to those produced by the private automobile. The passenger will invariably leave the bus under the impression that he has traveled at a much higher speed than had he been on a street car, even though the time is identical. There exists a certain feeling of good-fellowship or intimacy between the bus driver and his passengers. He appreciates the driver's skill in handling through heavy traffic a piece of equipment many times larger than the private automobile. He gets a thrill out of seeing this driver beat the red light at the intersection. He has a feeling that his driver is making every effort to get him to his destination as quickly as possible. The bus passenger is also appreciative of the fact that the bus picks him up at the sidewalk and returns him there. It relieves him of the necessity of making a mad dash through traffic to reach a safety zone, and in winter he is not obliged to wade across gutters and streets filled with slush.

Fares Must Be Adequate

If the bus can furnish these two prime requisites of today's city transportation—reasonable comfort and high speed—the question naturally arises as to the value of what the rider should pay for this kind of service. The average fare now charged on bus operation throughout the country is not only inadequate but is not consistent with the value received, and bus operators will, undoubtedly, encounter some difficulty in establishing a proper and adequate bus fare until such a time as the existing street car fare is raised to a point where it properly belongs.

One thing should not be lost sight of and that is the necessity of avoiding the establishment of a fixed fare precedent. A fixed fare is not in keeping with the flexibility of bus operation and will surely work a hardship on both the public and the operator.

Any collective effort in the matter of fares on the part of urban bus operators should at all times preserve to the individual property the right to adjust its fares to its particular conditions, and to all properties the right of a variable fare consistent with the nature of or class of service furnished.

**Abstract of a paper presented at a meeting of the Midwest Electric Railway Association, Hot Springs, Ark., Jan. 16-17, 1928.*

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In the matter of bus routes, an intelligent selection can be made only after a most exhaustive study. Where buses are routed through territory served by street cars bus routing should be such as to avoid as much as possible any close duplication of service. In substitution it is not necessary that the bus traverse the same route formerly traversed by the street cars. It should be permitted to take advantage of those features of topography and roadway that contribute to its best operation. Where community organizations and real estate developers demand bus routes in districts the available patronage of which will not support a route, it seems fair to make use of the trial method to obtain proof of the value of such a route. Under the trial method service is established for a certain test period and if at the end of that time the patronage has not been sufficient to support it, it is abandoned.

Other important features to be considered in selecting a route are conditions of pavement, facilities at the end of the route for turning or looping, and the traffic preference of the streets.

In the matter of pavement, statutes and ordinances providing for the assessment of costs of repairing and renewing pavement are in a more or less chaotic condition. The bus operator should be prepared to protect his interests if he would avoid that paving affliction with which the street railway industry has been burdened for so many years. The use of arterial highways by buses, when possible, offers a considerable advantage in that higher speeds may be maintained and there is also a considerable reduction in the collision hazard. There is another advantage by making use of streets or boulevards where snow removal is performed by city forces.

Standardized Bus Maintenance

Just a few words on bus maintenance. A type of bus maintenance organization that seems to be meeting with considerable success patterns somewhat after the general practice followed by steam roads in the maintenance of locomotives. The work conveniently divides itself into three general classes: inspection; running repairs; and back shop. Inspection crews are generally made up of one mechanic and a helper. These two men will work a bus from front bumper to tail light in one nine-hour day. They do very little repair work of any kind and no major repairs. Their chief duties are the checking of bearings, transmissions, differentials, brake riggings, engine adjustments, steering, etc. They are not called on to do any work about the garage other than this inspection. Buses are brought in for inspection on a predetermined mileage basis, varying on different properties from 2,500 to 4,000 miles.

The running repair crew make light inspections and repairs, being governed in their work largely by the operators' report cards turned in on the buses. The work of this crew is largely confined to night work in order to take advantage of having a majority of the equipment in the garage at one time.

The back shop does practically all of the repair work, such as overhauling engines, transmissions, rear ends, brake lining, drive lines, battery work, etc. These men do not work out on the floor. When inspection men find a defective part or a unit due for overhaul, they remove it from the bus, take it to the back shop and in exchange receive either a new or an overhauled unit as a replacement.

It is surprising to note the small amount of equipment required in a completely equipped back shop as compared to that found in a street car maintenance shop. This, in a measure, is because the widespread use in buses of high grade alloyed steels deprives the bus maintenance foreman of that general practice of the street car man of manufacturing so many of his own parts.

Trend of Bus Design

All of us in bus operation naturally are giving considerable thought as to what will constitute the ideal bus for city transportation. Unlike the street car, each succeeding year will see the development of a bus cheaper in first cost, maintenance and operating expense, improved in speed, riding qualities, and ease of handling. Present day bus construction is taking a trend toward these last named three qualities with an ever increasing simplicity in mechanical construction.

Do not let creep into the bus business that costly fallacy that has existed in the street car business which seems to demand a different type of street car for every city. Let the bus builder build your buses. Work with him but do not cramp his style by imposing on him restrictions born of a period in the past. Public demand will safely and surely pilot the evolution of the bus if you but give it the opportunity.

If you want to make a real contribution to the bus progress set up and follow an accounting system that will provide for the retirement and replacement of equipment on a short life basis as compared to the present life of a street car. This will have a tendency to lower first costs, stimulate improvement in design, and will at all times enable you to challenge the public with equipment suited to the demands of today.

Standard Steel Signs and Signals Recommended

AS A RESULT of a year's study by the American Engineering Council of the problem of a national system of standard street signs, signals and markings, the committee which had been engaged in this problem submitted recommendations based upon its findings. This work was carried on as the result of Council's participation in the National Conference on Street and Highway Safety. The fundamental data for the study were obtained from more than 100 of the principal cities of the country embracing a population of approximately 35,000,000.

The local work called into this public service nearly 400 engineers, safety men, and city officials, who were directly responsible for securing the data from the cities. The recommendations submitted proposed to establish a set of signs that will be recognized as standard throughout the country. Similarly, control of traffic through the automatic signal system was reported on, special reference being made to the type of signal, its location and the control best suited to the various city requirements.

Recommendations for markings, street car loading platforms and safety zones were also contained in the report.

Kentucky Association Elects

ABOUT 400 members of the Kentucky Association of Public Utilities attended the eleventh annual convention and banquet held at Louisville Jan. 18 and 19. The principal speakers at the dinner were the Hon. Edwin P. Morrow, Railway Wage Board, Washington, D. C., former Governor of Kentucky; and Lucius S. Storrs, managing director American Electric Railway Association. Ex-Governor Morrow in a humorous way touched on water power development in Kentucky, and expressed the hope that such resources would be developed to the greatest possible extent without robbing the state of scenic beauty. Public transportation was described by Mr. Storrs as the most important of all departments in the field of public utilities. Meddling of demagogues in the question of railway fares, he said, has often forced companies to operate at a loss and made it impossible to improve the service.

Officers elected for the coming year are:

President, Samuel Riddle, vice-president Louisville Railway.

First vice-president, W. H. Harton, gen. mgr. Cincinnati, Newport & Covington Railway.

Second vice-president, L. B. Herrington, president Kentucky Utilities Company.

Treasurer, A. A. Tuttle, vice-president, and treasurer, Kentucky Utilities Company.

Secretary, E. F. Kelley, secretary to the president Louisville Railway.

Mr. Riddle was advanced from first vice-president to president, and Mr. Harton was elected to the first vice-presidency, the other officers being re-elected.

The new board of directors comprises the officers and the following:

T. B. Wilson, vice-president and general manager Louisville Gas & Electric Company; J. P. Barnes, president Louisville Railway; W. S. Cramer, vice-president and general manager Lexington Water Company; W. R. Power, general manager Kentucky & West Virginia Power Company; P. S. Pogue, Louisville Heating Company; J. P. Pope, vice-president and general manager Kentucky Traction & Terminal Company; H. J. Cochrane, president Maysville Water Company; N. C. Funk, Kentucky Power Co.

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American Association News

Association Committees Appointed

COMMITTEE lists of the American Association have now been completed. These include the chairmen and vice-chairmen of the convention committees for the next annual meeting and exhibit of the association to be held in Cleveland next September, although the full membership of these convention committees has not yet been announced. The list follows:

Advisory Council

B. C. Cobb, vice-president Hodenpyl, Hardy & Company, New York., N. Y., chairman.
H. A. Blair, Chicago, Ill.
H. G. Bradlee, Boston, Mass.
N. F. Brady, New York, N. Y.
M. C. Brush, New York, N. Y.
B. I. Budd, Chicago, Ill.
G. H. Clifford, Boston, Mass.
F. R. Coates, New York, N. Y.
S. M. Curwen, Philadelphia, Pa.
H. L. Doherty, New York, N. Y.
C. D. Emmons, Baltimore, Md.
P. H. Gadsden, Philadelphia, Pa.
C. E. Groesbeck, New York, N. Y.
Edwin Gruhl, New York, N. Y.
Samuel Insull, Chicago, Ill.
T. N. McCarter, Newark, N. J.
S. Z. Mitchell, New York, N. Y.
J. J. O'Brien, Chicago, Ill.
J. H. Pardee, New York, N. Y.
H. Hobart Porter, New York, N. Y.
A. W. Robertson, Pittsburgh, Pa.
J. N. Shannahan, Omaha, Neb.
Paul Shoup, San Francisco, Cal.
R. P. Stevens, New York, N. Y.
Lucius S. Storrs, New York, N. Y.
A. W. Thompson, Philadelphia, Pa.
O. D. Young, New York, N. Y.

Policy

J. P. Barnes, president Louisville Railway, Louisville, Ky., chairman.
Paul Shoup, San Francisco, Cal., vice-chairman.
J. G. Barry, Schenectady, N. Y.
M. B. Lambert, New York, N. Y.
Harry Reid, New York, N. Y.
G. A. Richardson, Chicago, Ill.
J. N. Shannahan, Omaha, Neb.

Finance

T. A. Kenney, Hodenpyl, Hardy & Co., New York, N. Y., chairman.
C. R. Ellicott, New York, N. Y., vice-chairman.
F. W. Doolittle, New York, N. Y.
C. E. Morgan, Brooklyn, N. Y.
E. P. Waller, Schenectady, N. Y.

Subjects and Meetings

F. R. Coates, president the Community Traction Company, c/o H. L. Doherty & Co., New York, N. Y., chairman.
J. P. Barnes, Louisville, Ky.
J. R. Blackhall, Highwood, Ill.
H. V. Bozell, New York, N. Y.
C. A. Brooks, New York, N. Y.
L. C. Bradley, Providence R. I.
R. F. Carbutt, New York, N. Y.
H. C. Clark, Newark, N. J.
G. H. Clifford, Boston, Mass.
L. J. DeLamarter, Grand Rapids, Mich.
Walter A. Draper, Cincinnati, Ohio.
F. W. Doolittle, New York, N. Y.
Charles Gordon, New York, N. Y.
M. B. Lambert, New York, N. Y.
M. McCants, San Francisco, Cal.
C. E. Morgan, Brooklyn, N. Y.
L. H. Palmer, New York, N. Y.
W. T. Rossell, Pittsburgh, Pa.
Edward A. West, Salt Lake City, Utah.

Publicity

Paul Shoup, president Pacific Electric Railway, San Francisco, Cal., chairman.
Barron Collier, New York, N. Y., vice-chairman.
F. L. Blanchard, New York, N. Y.
F. G. Buffe, Kansas City, Mo.
W. H. Burke, Houston, Tex.
F. D. Burpee, Ottawa, Canada.
Joe Carmichael, Des Moines, Iowa.
H. C. Clark, Newark, N. J.
H. O. Crews, Chicago, Ill.
Robert Dougan, Washington, D. C.
P. H. Gadsden, Philadelphia, Pa.
L. E. Gould, Chicago, Ill.
W. V. Hill, San Francisco, Cal.
W. H. Hodge, Chicago, Ill.
J. P. Ingle, Jacksonville, Tex.
R. J. Lockwood, St. Louis, Mo.
Hal M. Lytle, Chicago, Ill.
J. C. McQuiston, E. Pittsburgh, Pa.
Martin P. Rice, Schenectady, N. Y.
J. S. S. Richardson, New York, N. Y.
D. W. Snyder, Jr., Springfield, Ill.
L. K. Starr, Atlanta, Ga.
W. P. Strandborg, Portland, Ore.
A. C. Watt, New York, N. Y.
E. F. Wickwire, Mansfield, Ohio.

National Relations

J. H. Hanna, president Capital Traction Co., Washington, D. C., chairman.
Frank Karr, Los Angeles, Cal., vice-chairman.
R. R. Bradley, Chicago, Ill.
A. W. Brady, Anderson, Ind.
C. D. Cass, Waterloo, Iowa.
G. H. Clifford, Boston, Mass.
G. H. Harries, Chicago, Ill.
Frank Silliman, Jr., New York, N. Y.
D. W. Snyder, Jr., Springfield, Ill.
E. W. Wakelee, Newark, N. J.
B. F. Weadock, New York, N. Y.
F. H. Wilson, Cleveland, Ohio.

Depreciation

(Sub Committee of National Relations)
Thomas Conway, Jr., president Cincinnati, Hamilton & Dayton Railway, Philadelphia, Pa., chairman.
L. R. Nash, Boston, Mass., vice-chairman.
F. W. Doolittle, New York, N. Y.
M. W. Glover, Pittsburgh, Pa.
C. R. Harte, New Haven, Conn.
A. S. Richey, Worcester, Mass.
Richard Sachse, Los Angeles, Cal.
C. E. Thompson, Chicago, Ill.
J. H. Hanna, Washington, D. C., ex officio.

Publications

J. H. Hanna, president Capital Traction Co., Washington, D. C., chairman.
H. V. Bozell, New York, N. Y., vice-chairman on Aera.
F. W. Doolittle, New York, N. Y., vice-chairman on statistics.
J. L. Alexander, Houston, Tex.
G. B. Anderson, Los Angeles, Cal.
T. W. Casey, New York, N. Y.
Charles Gordon, New York, N. Y.
T. R. Langan, New York, N. Y.
H. H. Norris, Boston, Mass.
A. S. Richey, Worcester, Mass.
W. H. Sawyer, New York, N. Y.
R. S. Tompkins, Baltimore, Md.
E. P. Waller, Schenectady, N. Y.

Membership

C. E. Morgan, vice-president and general manager Brooklyn City Railroad, Brooklyn, N. Y., chairman.
T. W. Casey, New York, N. Y., vice-chairman.
J. H. Alexander, Cleveland, Ohio.
G. B. Anderson, Los Angeles, Cal.
T. A. Aspell, Akron, Ohio
J. D. Augustus, Louisville, Ky.
J. M. Bamberger, Salt Lake City, Utah.
D. E. Batesole, Stamford, Conn.
C. P. Billings, New York, N. Y.
J. R. Blackhall, Highwood, Ill.
D. E. Blair, Montreal, Canada.
A. C. Blinn, Akron, Ohio.
A. J. Boardman, Boston, Mass.
Ray Boiselle, Boston, Mass.
W. H. Boyce, Pittsburgh, Pa.
M. R. Boylan, Newark, N. J.
C. A. Brooks, New York, N. Y.
C. P. Brown, Fargo, N. D.
W. M. Brown, Seattle, Wash.
F. G. Buffe, Kansas City, Mo.
W. H. Burke, Houston, Tex.
F. D. Burpee, Ottawa, Canada.
F. L. Butler, Atlanta, Ga.
R. B. Campbell, Wichita, Kan.
C. C. Castle, New York, N. Y.
F. C. Chambers, Des Moines, Ia.
C. M. Cheney, Waterloo, Iowa.
H. B. Cobban, Miami, Okla.
G. E. Cockings, Bristol, Conn.
R. C. Coffy, Fort Smith, Ark.
Stuart Cooper, Charleston, S. C.
F. A. Cornell, Detroit, Mich.
S. J. Cotsworth, Philadelphia, Pa.
H. D. Crampton, Dallas, Tex.
H. N. Crandall, Presque Isle, Me.
C. F. Crane, Harrisburg, Pa.
J. B. Crawford, Concord, N. H.
F. B. Culley, Augusta, Ga.
S. M. Curwen, Philadelphia, Pa.
C. H. Dahl, Brooklyn, N. Y.
F. P. D'Arcy, Kalamazoo, Mich.
J. V. Davis, Washington, D. C.
L. J. DeLamarter, Grand Rapids, Mich.
V. N. DeLamater, Newark, N. J.
B. J. Denman, Chicago, Ill.
H. F. Dicke, Allentown, Pa.
Harold Dowd, Waterbury, Conn.

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J. J. Doyle, Baltimore, Md.
W. A. Draper, Cincinnati, Ohio.
C. R. Ellicott, New York, N. Y.
Harrison Emhardt, Washington, D. C.
B. J. Fallon, Chicago, Ill.
T. A. Ferneding, Dayton, Ohio.
A. H. Ferrandou, Detroit, Mich.
Thomas Finigan, Chicago, Ill.
J. R. Fitzpatrick, Chicago, Ill.
H. B. Flowers, New Orleans, La.
B. W. Frauenthal, St. Louis, Mo.
H. L. Geisse, Wausau, Wis.
C. F. Gilbert, St. Louis, Mo.
W. S. Godwin, Baltimore, Md.
F. D. Gordon, Portland, Me.
L. O. Gordon, New York, N. Y.
L. E. Gould, Chicago, Ill.
F. O. Grayson, St. Louis, Mo.
C. J. Griffith, Little Rock, Ark.
E. H. Hammond, Phillipsdale, R. I.
T. J. Hanlon, Jr., Tampa, Fla.
W. H. Harton, Covington, Ky.
C. H. Harvey, Knoxville, Tenn.
D. W. Harvey, Toronto, Canada.
C. S. Hawley, Albany, N. Y.
H. B. Hearn, Shreveport, La.
E. R. Heiny, Lincoln, Neb.
B. Hilburn, Tulsa, Okla.
W. V. Hill, San Francisco, Cal.
E. F. Hodgkins, Gardner, Me.
W. W. Holden, San Antonio, Tex.
W. W. Horwood, Montreal, Canada.
Raymond Hunt, Wilmington, N. C.
J. P. Ingle, Jacksonville, Fla.
J. R. Jeffrey, Milwaukee, Wis.
A. P. Jenks, Chicago, Ill.
Rankin Johnson, **Trenton, N. J.**
A. L. Kasemeier, Winton Place, Ohio.
George Keegan, New York, N. Y.
G. L. Kippenberger, St. Louis, Mo.
E. S. Knisely, Bethlehem, Pa.
E. J. Lang, Cleveland, Ohio.
R. A. Leussler, Omaha, Neb.
R. L. Lindsey, Durham, N. C.
M. McCants, San Francisco, Cal.
J. H. McClure, Dayton, Ohio.
C. J. McCormick, New York, N. Y.
E. F. McKay, Oklahoma City, Okla.
W. J. McKee, Worcester, Mass.
A. D. McWhorter, Memphis, Tenn.
G. L. Maltby, Jamestown, N. Y.
W. A. Maynard, Cleveland, Ohio.
Richard Meriwether, Dallas, Tex.
G. R. Millican, Evansville, Ind.
Dudley Montgomery, Madison, Wis.
P. H. Mulcahy, Ogden Utah.
C. P. Nachod, Louisville, Ky.
M. N. Newell, Richmond, Va.
H. H. Norris, Boston, Mass.
W. N. Osburn, Cleveland, Ohio.
H. A. Oswald, Stratford, Canada.
L. H. Palmer, New York, N. Y.
A. M. Patten, Topeka, Kan.
J. P. Pope, Lexington, Ky.
C. D. Porter, Hampton, Va.
A. E. Potter, Providence, R. I.
H. B. Potter, Baltimore, Md.
A. E. Pratt, Parlin, N. J.
J. P. Pulliam, Milwaukee, Wis.
J. K. Punderford, New Haven, Conn.
J. A. Queeney, Philadelphia, Pa.
H. W. Renick, Los Angeles, Cal.
A. E. Reynolds, Springfield, Mo.
A. L. Reynolds, Miami, Fla.
A. S. Richey, Worcester, Mass.
Samuel Riddle, Louisville, Ky.
M. F. Riley, Hagerstown, Md.
A. M. Robertson, Minneapolis, Minn.
H. S. Robertson, Denver, Colo.
E. A. Ross, Lafayette, Ind.
J. E. E. Royer, Spokane, Wash.
W. H. Sawyer, New York, N. Y.
C. F. Schmidt, Indianapolis, Ind.
S. H. Serena, Tompkinsville, N. Y.
C. M. Sharpe, Washington, D. C.
H. J. Sheeran, New York, N. Y.
K. A. Simmon, East Pittsburgh, Pa.
E. B. Smith, New York, N. Y.
J. B. Smith, Manchester, N. H.
R. R. Smith, South Bend, Ind.
D. W. Snyder, Jr., Springfield, Ill.
W. F. Stanton, Rochester, N. Y.
F. F. Stockwell, Cambridge, Mass.
W. P. Strandborg, Portland, Ore.
R. F. Stubblebine, New York, N. Y.
Richard Sullivan, Tacoma, Wash.
J. V. Sullivan, Chicago, Ill.
Alfred Sweeney, Lewiston, Me.
A. Taurman, Birmingham, Ala.
Perley A. Thomas, High Point, N. C.
W. E. Thompson, New York, N. Y.
P. A. Tillery, Raleigh, N. C.
R. I. Todd, Indianapolis, Ind.
C. L. Van Auken, Chicago, Ill.
J. H. VanderVeer, New York, N. Y.
E. P. Waller, Schenectady, N. Y.
Herbert Warren, Duluth, Minn.
S. B. Way, Milwaukee, Wis.
H. B. Weatherwax, Albany, N. Y.
E. A. West, Salt Lake City, Utah.
H. R. Whitney, Worcester, Mass.
E. A. Williford, Cleveland, Ohio.
T. W. Wilson, Wilmington, Del.
C. H. Wondries, South Bend, Ind.
W. E. Wood, Richmond, Va.
P. W. Wood, New Orleans, La.
J. B. Woolum, Jackson, Miss.
L. M. Zapp, Detroit, Mich.

Specific Assignments

(Sub-committee of the membership committee).

B. I. Budd, president Chicago Rapid Transit Co., Chicago, Ill., chairman.
C. D. Cass, Waterloo, Iowa.
A. H. Ehle, Philadelphia, Pa.
C. R. Ellicott, New York, N. Y.
C. D. Emmons, Baltimore, Md.
P. H. Gadsden, Philadelphia, Pa.
C. B. Keyes, New York, N. Y.
M. B. Lambert, New York, N. Y.
L. H. Palmer, New York, N. Y.
J. N. Shannahan, Omaha, Neb.
Paul Shoup, San Francisco, Cal.

Charles A. Coffin Foundation Prize

R. P. Stevens, president Penn-Ohio Edison Co., New York, N. Y., chairman.
J. P. Barnes, Louisville, Ky.
J. H. McGraw, New York, N. Y.

Convention Committees

Contract (Sub-Committee)

Frank R. Coates, Henry L. Doherty & Co., New York, N. Y., chairman.

Exhibit

Joseph H. Alexander, President Cleveland Ry., Cleveland, Ohio, chairman.
L. W. Shugg, Schenectady, N. Y., vice-chairman.

Entertainment

C. S. MacCalla, vice-president and general manager Pennsylvania-Ohio Edison Company, Youngstown, Ohio, chairman.
J. C. McQuiston, East Pittsburgh, Pa., vice-chairman.

Hotel

Paul E. Wilson, vice-president Cleveland Railway, Cleveland, Ohio. chairman.
E. J. Speh, Cleveland, Ohio, vice-chairman.

Transportation

E. C. Faber, vice-president Barron G. Collier, Inc., New York, N. Y., chairman.

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E. F. Wickwire, vice-president Ohio Brass Co., Mansfield, Ohio, chairman.
Martin Ackerman, Dayton, Ohio
David Beecroft, New York, N. Y.
W. A. Blume, Detroit, Mich.
W. H. Boyce, Pittsburgh, Pa.
T. W. Casey, New York, N. Y.
L. J. DeLamarter, Grand Rapids, Mich.
G. E. Doke, Chicago, Ill.
W. H. Dowd, Waterbury, Conn.
H. B. Doyle, New York, N. Y.
Walter Drey, New York, N. Y.
E. C. Faber, New York, N. Y.
A. H. Ferrandou, Detroit, Mich.
George Frey, Philadelphia, Pa.
Charles Gordon, New York, N. Y.
L. E. Gould, Chicago, Ill.
C. L. Hancock, New York, N. Y.
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W. V. Hill, San Francisco, Cal.
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A. P. Jenks, Chicago, Ill.
H. J. Kenfield, Chicago, Ill.
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M. B. Lambert, New York, N. Y.
C. M. McCreery, Philadelphia, Pa.
J. N. McDonald, New York, N. Y.
J. J. McMahon, New York, N. Y.
E. B. Meissner, St. Louis, Mo.
J. D. Porter, Pittsburgh, Pa.
S. P. Seward, Cleveland, Ohio
L. F. Stoll, New York, N. Y.
E. P. Waller, Schenectady, N. Y.
G. W. Welsh, East St. Louis, Ill.
J. M. Yount, San Francisco, Cal.

Cooperation with Motor Vehicle Industry

Lucius S. Storrs, managing director American Electric Railway Association, New York, N. Y., chairman.
A. W. Brady, Anderson, Ind.
C. D. Emmons, Baltimore, Md.
M. B. Lambert, New York, N. Y.
E. W. Wakelee, Newark, N. J.

Cooperation with State and Sectional Associations

T. A. Kenney, Hodenpyl, Hardy & Co., New York, N. Y., chairman.
F. G. Buffe, Kansas City, Mo.
W. A. Draper, Cincinnati, Ohio
R. B. Stearns, Boston, Mass.
J. P. Pulliam, Milwaukee, Wis.
W. B. Tuttle, San Antonio, Tex.

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J. S. Hyatt, Chicago, Ill., vice-chairman.
L. P. Baurhenn, Newark, N. J.
A. C. Blinn, Akron, Ohio
W. H. Burke, Houston, Tex.
J. A. Dewhurst, New York, N. Y.
H. H. Fenton, Pittsburgh, Pa.
M. B. Lambert, New York, N. Y.
M. McCants, San Francisco, Cal.
F. H. Miller, Louisville, Ky.
H. H. Norris, Boston, Mass.
H. B. Potter, Baltimore, Md.
A. J. Rowland, Milwaukee, Wis.
A. J. Sarre, New Orleans, La.
C. D. Smith, Cleveland, Ohio

Electric Railway Finance 1928

L. C. Bradley, president Rhode Island Public Service Company, Providence R. I., chairman.
J. G. Barry, Schenectady, N. Y.
J. C. Bennett, New York, N. Y.
G. H. Clifford, Boston, Mass.
S. M. Curwen, Philadelphia, Pa.
G. E. Fraser, Chicago, Ill.
Harry Reid, New York, N. Y.
P. W. Winslow, New York, N. Y.
P. S. Young, Newark, N. J.

Employe—Customer Contact

Thomas Fitzgerald, vice-president Pittsburgh Railways, Pittsburgh, Pa., chairman.
D. W. Gordon, Chicago, Ill.
C. D. Smith, Cleveland, Ohio
D. W. Snyder, Jr., Springfield, Ill.
C. E. Thorney, Chicago, Ill.
W. E. Wood, Richmond, Va.

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Thomas Fitzgerald, Pittsburgh, Pa., vice chairman.
J. P. Barnes, Louisville, Ky.
S. B. Way, Milwaukee, Wis.
W. E. Wood, Richmond, Va.

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H. B. Potter, general manager United Railways & Electric Company, Baltimore, Md., chairman.
A. Benham, Cincinnati, Ohio.
O. H. Bernd, Des Moines, Iowa
G. H. Bourne, New York. N. Y.
F. L. Butler, Atlanta, Ga.
R. S. Childs, New York, N. Y.
Stanley Clarke, St. Louis, Mo.
N. H. Daniels, Boston, Mass.
F. M. Hamilton, Chicago, Ill.
A. D. Knox, New Haven, Conn.
J. H. Moran, Boston, Mass.
F. J. Petura, New York, N. Y.
D. W. Pontius, Los Angeles, Cal.
J. P. Pulliam, Milwaukee, Wis.
H. M. Shaw, Springfield, Ill.
B. L. Tomes, Philadelphia, Pa.
P. E. Wilson, Cleveland, Ohio

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R. H. Pinkley, Milwaukee, Wis., vice-chairman.
C. H. Forsgard, Toledo, Ohio
M. W. Glover, Pittsburgh, Pa.
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H. A. Johnson, Chicago, Ill.
I. A. May, New Haven, Conn.
G. H. Scragg, New York, N. Y.

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L. C. Bradley, Providence, R. I.
F. G. Buffe, Kansas City, Mo.
F. L. Butler, Atlanta, Ga.
F. A. Cummings, Boston, Mass.
B. J. Fallon, Chicago, Ill.
H. B. Flowers, New Orleans, La.
M. B. Lambert, New York, N. Y.
R. L. Lindsey, Durham, N. C.
W. H. Lines, Portland, Ore.
H. B. Potter, Baltimore, Md.
R. I. Todd, Indianapolis, Ind.
W. B. Tuttle, San Antonio, Tex.
E. P. Waller, Schenectady, N. Y.
S. B. Way, Milwaukee, Wis.
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J. P. Barnes, Louisville, Ky.
H. M. Blain, New Orleans, La.
F. J. Bollmeyer, Cleveland, Ohio
F. G. Buffe, Kansas City, Mo.
R. F. Carbutt, New York, N. Y.
F. C. Chambers, Des Moines, Iowa
Alfred Fischer, New York, N. Y.
Thomas Fitzgerald, Pittsburgh, Pa.
H. B. Flowers, New Orleans, La.
P. H. Gadsden, Philadelphia, Pa.
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D. W. Pontius, Los Angeles, Cal.
J. P. Pulliam, Milwaukee, Wis.
J. S. S. Richardson, New York, N. Y.
J. B. Sheridan, St. Louis, Mo.
R. B. Stearns, Boston, Mass.
E. A. West, Salt Lake City, Utah
C. G. Willard, New Haven, Conn.
W. E. Wood, Richmond, Va.

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W. B. Bennett, St. Louis, Mo.
Edward Dana, Boston, Mass.
H. E. Ehlers, Philadelphia, Pa.
S. E. Emmons, Baltimore, Md.
B. J. Fallon, Chicago, Ill.
Thomas Fitzgerald, Pittsburgh, Pa.
E. J. McIlraith, Chicago, Ill.
R. F. Kelker, Jr., Chicago, Ill.
W. S. Menden, Brooklyn, N. Y.
D. W. Pontius, Los Angeles, Cal.
C. E. Smith, New Haven, Conn.
F. H. Shepard, New York, N. Y.
J. B. Stewart, Jr., Springfield, Ill.
D. L. Turner, New York, N. Y.
James Walker, Chicago, Ill.

Street Traffic and Mass Transportation

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J. A. Beeler, New York, N. Y.
J. R. Bibbins, Washington, D. C.
M. R. Boylan, Newark, N. J.
Edward Dana, Boston, Mass.
S. E. Emmons, Baltimore, Md.
E. P. Goodrich, New York, N. Y.
R. F. Kelker, Jr., Chicago, Ill.
Miller McClintock, Cambridge, Mass.
E. J. McIlraith, Chicago, Ill.
L. H. Palmer, New York, N. Y.
C. E. Smith, New Haven, Conn.

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C. H. Allen, Chicago, Ill.
G. G. Brownell, New York, N. Y.
H. A. Clark, San Diego, Cal.
A. T. Davidson, New York, N. Y.
R. M. Feustel, Fort Wayne, Ind.
H. L. Geisse, Wausau, Wis.
J. P. Griffin, Dallas, Tex.
D. J. Hennessey, Pittsburgh, Pa.
L. R. Nash, Boston, Mass.
D. J. Strouse, Minneapolis, Minn.
J. L. Swope, Baltimore, Md.
E. W. Wakelee, Newark, N. J.

Representatives of the association on other national organizations.

U. S. Chamber of Commerce

J. N. Shannahan, president Omaha & Council Bluffs Street Railway, Omaha, Neb., national councillor.
J. H. Hanna, president Capital Traction Company, Washington, D. C., substitute national councillor.

Conference on Street and Highway Safety

J. P. Barnes, president Louisville Railway, Louisville, Ky., chairman.
L. H. Palmer, vice-president and general manager Fifth Avenue Coach Company, New York, N. Y., vice-chairman.

National Safety Council

R. W. Emerson, vice-president and general manager Cleveland Railway, Cleveland, Ohio, representative.
Thomas Fitzgerald, vice-president Pittsburgh Railways, Pittsburgh, Pa., alternate.

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F. R. COATES, Henry L. Doherty & Company, New York, N. Y., representative.

LUCIUS S. STORRS, managing director American Electric Railway Association, New York, N. Y., representative.

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H. G. BRADLEE, Boston, Mass.
B. I. BUDD, Chicago, Ill.
F. R. COATES, New York, N. Y.
B. C. COBB, New York, N. Y.
T. N. McCARTER, Newark, N. J.
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R. P. STEVENS, New York, N. Y.
L. S. STORRS, New York, N. Y.
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AMERICAN COMMITTEE ON INDUCTIVE CO-ORDINATION

W. H. SAWYER, president Stevens & Wood, Inc., New York, N. Y., chairman.
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R. G. WINANS, New York, N. Y., alternate.
G. C. HECKER, New York, N. Y., representative and secretary of entire committee.
J. W. WELSH, New York, N. Y., alternate.
W. R. STINEMETZ, East Pittsburgh, Pa., representative.
R. D. EVANS, East Pittsburgh, Pa., alternate.

Rolling Stock Special Committee No. 3

DISCUSSION of the conditions under which the tests of various drives would be conducted at the Bureau of Standards in Washington took up the time of the sub-committee on tests at a meeting held at Chicago, Ill., on Jan. 12. Those present were H. H. Adams, chairman; C. A. Burleson, W. J. Clardy, A. L. Kasemeier and G. L. Kippenberger.

Due to construction requirements of some of the drives it was found impossible to separate the losses sustained in the gearing from those sustained in the accompanying substitutes for the journal bearings used in ordinary street car equipment. It would require that in these tests the efficiency would have to be determined as over-all efficiency from motor connection to wheel rim. On this account it was decided that if possible all units should be tested under these same conditions and the efficiency determined on that basis.

Lubrication of the units during test was discussed, and it was decided that in order to secure efficiency figures on the various types of units as operating under service conditions as nearly as possible, that it would be advisable to use the lubrication appropriate to the specific type of unit as actually in service.

As some of the units are equipped with anti-friction bearings in place of the plain standard journal bearings, it was felt that this test should also determine if possible the effect of this type of bearing on the efficiency of these units. It was felt that one type of unit equipped with anti-friction journal bearings would be sufficient, as the proportionate gain in efficiency secured by the use of this bearing could be taken into consideration when discussing the efficiency of any other type of unit if it should be equipped with anti-friction journal bearings.

On this basis it was then determined that the following types of drives would be required for tests at Washington:

1. One truck equipped with two W-N double reduction drive units, one unit to be equipped with plain journal bearings and the other to be equipped with anti-friction journal bearings.

2. One truck equipped with two units consisting of one Cincinnati Car Company type of worm-drive unit and one single reduction spur gear drive of the Tool Steel Gear & Pinion Company.

3. One truck of two units each equipped with one St. Louis Car Company type of worm-drive unit and one axle prepared for use with the standard single reduction motor drive as it is now being used.

4. One unit of the Timken-Detroit Axle Company's type of worm drive.

5. One unit of the Eaton Spring & Axle Company type of double reduction drive.

The General Electric Company agreed to furnish if necessary a GE-265 motor for use with the single reduction spur gearing unit of truck C, and also a GE-1126 600-volt 35-hp. automotive type motor for use at the Bureau of Standards. The Westinghouse Electric & Manufacturing Company agreed to furnish if necessary a No. 1425 600-volt 35-hp. automotive type motor, or a V-91 300-volt 28-hp. type of motor for use at the Bureau of Standards. They also agreed to furnish a series of drawings showing set-ups under which these units might be tested and have them ready if possible for the next committee meeting.

W. & S. Special Committee No. 7

SPECIAL committee No. 7 of the way and structures division of the Engineering Association, appointed to study the possibilities of the use of alloy steels other than manganese in special trackwork, held a meeting in Philadelphia on Jan. 11.

The meeting was attended by the following members: A. T. Spencer, chairman; W. G. Hulbert representing J. H. Hall, F. G. Hibbard, P. A. Kerwin, R. H. Noderer, O. C. Rehfuss and N. E. Salsich. J. F. Rodgers and Mr. Raiguel of the P.R.T. were also present.

Last year's work was reviewed and arrangements made to follow the experience gained from existing installations and report. Offers were accepted from committee members to make road experiments with welds made on artificially broken corners on new chrome-nickel and manganese steel pieces. Tentative arrangements were also made be gin laboratory experiments to determine, if possible, the comparative weldability of these two metals.

Following the business meeting, the committee, under the guidance of John F. Rodgers, of the Philadelphia Rapid Transit Company, inspected a number of special trackwork layouts of chrome-nickel steel.

Association Reports in Preparation

SPECIAL reports being prepared by the Bureau of Information and Service of the American Electric Railway Association are listed below. They will be available to member companies on request:

Bulletin No. 178.—Motor Bus Legislation in 1927—Contains complete copies of all motor bus regulatory legislation passed during the year 1927 with a carefully prepared analytical index permitting ready reference to any section of the new laws. This bulletin supplements Bulletin No. 120, State Regulation of Motor Bus Common Carriers, issued Jan. 1, 1927, and covers all legislation enacted since the date of that bulletin.

Bulletin No. 179.—Electric Railway Financing—Gives a list of the new securities issued by electric railways in 1927, showing the type of security, the amount issued, the interest rate and the offering price. The bulletin also contains a summary of securities defaulted, retired or refunded during the year, the amounts of securities outstanding of companies abandoning service during the year and a summary of the net effect of these new issues and retirements on the capitalization of the industry.

Bulletin No. 180.—Daily, Weekly and Monthly Pass and Identification Card—Contains a list of companies using the various forms of the pass or identification card idea with the reasons for adopting it and a summary of the results obtained and the opinions of operators as to their advantages and disadvantages. It also gives a list of companies which have experimented with and discontinued the use of the pass or the identification card, together with a summary of their results and the reasons for the discontinuance.

Bulletin No. 181.—Trend of Material Prices—A new edition of the Association's regular bulletin on relative costs of materials, bringing down to date the trend of prices of materials used by electric railways based on data contributed by the manufacturers of such material.

In addition to the above the following supplements have been prepared, bringing the information they cover down to date:

Supplement No. 3 to Bulletins Nos. 163 and 164, Electric Railway Fares.

Supplement No. 4 to Bulletin No. 160, Wages of Trainmen.

Supplement No. 4 to Bulletin No. 161, Wages of Bus Men.

Cost of Living Studies (Bulletin No. 182).

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News of the Industry

Hearings on Public Control

Committee of Massachusetts Legislature takes up question of future of Boston "L"

PUBLIC hearings were begun this week before two committees of the Massachusetts Legislature on the various bills pertaining to the future treatment of the Boston Elevated Railway. It was brought out at the opening hearing that the trustees of the Boston Elevated favor the proposition from the Metropolitan Planning Division to extend the public control fifteen years, and also favor the proposed extensions of the subway lines at a cost of $35,000,000 to $40,000,000.

H. Ware Barnum spoke for the Board of Trustees, as its counsel. He said that the trustees did not directly indorse at this time the proposed extension to Malden Square, because it has not given the matter sufficient study. The trustees differed from the Planning Division in one important detail on the division of cost. The trustees feel that the car riders should be required to pay only one-third, while the Planning Division proposed that they should pay one-half. The amounts that do not come out of fares should be raised by betterment assessments or certain forms of taxation.

Assessment for Betterments Held to Be Legal

The Supreme Court has ruled that assessment of betterment in the district traversed by the rapid transit line is legal, and Mr. Barnum showed how real estate values have gone up by citing one example on the Dorchester extension. There the Elevated before the extension bought a key piece of land for 25 cents a foot which now has a value of $1.50 a foot. It is only fair that land thus benefitted should pay a part of the cost of the rapid transit lines.

While sentiment is strong for continued public control of the Elevated, still it became clear also that there is an element in the Legislature which will fight for immediate public ownership of the road. The hearings will continue, according to Senate Chairman Warren, so long as the public desires to discuss the matter before the committee.

One of the problems coming under discussion now is what is to become of the company at the end of 40 years when the bonds to be issued in connection with service extensions will mature; whether the state has not by that time acquired a property right which establishes a form of state ownership and therefore commits the state to public ownership.

Another issue raised is whether the stockholders of the Elevated can be made to accept the proposed legislation and to carry out the $40,000,000 extension projects which are promised. The present answer to this is that there are two parties to the contract and the rights of the Elevated stockholders to accept or reject any new contract offered by the Legislature must be respected.

Final Hearing on Walsh Resolution Set for Jan. 30

Conclusion of hearings on the Walsh public utilities resolution was definitely set for Jan. 26, and consideration in committee scheduled for Jan. 30, by the Chairman, Senator Watson, of Indiana, following the Jan. 25 session of the Senate Committee on Interstate Commerce.

The only witness heard on Jan. 25 was the chairman, James Emery, of the National Association of Manufacturers. Mr. Emery concluded his statement of the preceding day, and was questioned by members of the committee. The only remaining witness is the chairman, W. B. Ainey, of the Pennsylvania Public Service Commission.

Former Senator Irvine L. Lenroot, counsel for the Joint Committee of National Utility Associations, announced that he might call upon W. L. Ransom, New York attorney, who helped prepare the joint committee's brief, to make a final statement. Senator Walsh of Montana, author of the resolution proposing an inquiry by a special Senate committee into the gas and electric industries, stated that he would require no more than a half hour to conclude his presentation.

Senator Watson stated orally, following the hearing, that the procedure he has outlined had been fixed upon in order to give members of the committee and the Senate time to read the record of the hearings. He said he could not say whether a committee report could be expected after the Jan. 30 session. He said:

> This is a highly important matter, and we cannot act too hastily. We will give all interested parties until next Monday to read the record, and then take up the resolution in executive session. We hope to finish shortly, but cannot tell.

Endless Chain Plan Reappears in Des Moines

Officials of the Des Moines City Railway, Des Moines, Ia., have found it necessary to warn the public against a company which was reported to be selling the regular weekly pass on the endless chain plan. Otto H. Bernd, secretary of the railway, stated that the plan was similar to the one used in many localities to dispose of merchandise. The first purchaser paid in 25 cents and received a card with slots for six more 25-cent pieces. When six friends had paid 25 cents each the original customer got a pass worth $1.25. Then they in turn started out to repeat on their friends. Mr. Bernd estimated that by the time the fifth cycle was reached, it would require nearly 50,000 persons, whereas, the largest sale of passes ever recorded here was 13,000.

Hearings on Oakland's Fare

Ten-cent fare petition in Californian city put over until March. Company opposed to commission's zone order

AFTER a two-day hearing, State Railroad Commissioner Clyde Seavey adjourned the zone rate case of the Key System Transit Company, Oakland, Calif., until March 6. Pressing their demand for a 10-cent fare and $1 weekly passes, officials of the company on the first day of the hearing, Jan. 24, in Oakland City Hall, declared that the commission's 5-cent zone fare order would result in a loss of $1,078,666 annually.

Richard Sachse, noted consulting engineer, chief witness for the company, stated that of this loss $1,003,811 would be in the traction division and $73,855 in the ferry division. Citing Seattle, it was shown that during 1923, when the rate in that city was reduced from 10 cents to 5 cents for 107 days, there was a resultant loss of $1,790,000 based on an annual computation. Mr. Sachse also said that when fares in Chicago were reduced from 8 cents to 7 cents it required five years for the street railroads to recover from the loss.

Vice-President C. C. Vargas, of the Key System, testified that the company was operating at a loss under the present 7-cent fare, and H. P. Bell, chief engineer, claimed that the system's income was insufficient to meet maintenance and new equipment needs.

A battle over a bulletin published by the American Electric Railway Association developed on the second day of the hearing. The bulletin had to do with the resultant traffic on street-car lines in ten cities following rate reductions. H. E. Mott, chief engineer of the California Railroad Commission and author of the 5-cent zone plan for the East Bay, urged Herman Phleger, chief counsel for the Key, to introduce the bulletin as evidence. Mr. Phleger refused, citing the danger of misinterpretation, and Mr. Mott said he could not introduce it because it had been given him in confidence. Assistant Attorney John Collier, of Oakland, asked Commissioner Seavey to order

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the bulletin produced. Mr. Phleger objected but agreed to the admission of the document by the consent of the association or by any of the cities involved.

Cross-examined by Assistant Attorney Collier, Mr. Sachse admitted that the combined traffic of the Market Street and municipal railways in San Francisco, which operate under a 5-cent fare, showed an increase in 1927 passenger traffic. The Market Street lines show a falling off of 0.7 per cent, whereas the municipal lines gained 1.507 per cent.

Officials of all East Bay cities were represented at the hearing to oppose the Key System's 10-cent fare demand.

$13,000,000 Subway Item for New York Approved

Mayor Walker of New York has signed the Municipal Assembly bill to enable the Board of Estimate to dispense with the certificate of the comptroller in including an item for $13,000,000 for the amortization of a proposed issue of $52,000,000 of short-term subway construction bonds in the 1928 budget.

A decision on the Citizens Union action to compel the board to eliminate the item from the budget is expected soon from the Court of Appeals. Both Supreme Court Justic Wasservogel and the Appellate Division decided in favor of the Citizens Union and the item is now out of the budget, with the understanding that it may be restored if the Court of Appeals' decision is favorable to the city administration.

The Board of Estimate on Jan. 20 postponed for one week approval of the contracts for the construction of the Nassau Street subway recommended by the Board of Transportation to get the opinion of a disinterested engineer, yet to be selected, on the merits of the "cut and cover" and tunnel methods of construction.

Express Service in Detroit to Be Extended

Just as soon as equipment is available express service on the Grand River Line of the Detroit Municipal Railway, Detroit, Mich., will be started. Since the inception of the express service on Jefferson Avenue the revenues on that line have been increased materially despite the falling off in employment in this section. Ultimately the commission expects to extend the service to all of the major lines of the system.

As one editorial writer put it the experiment was a great boon to people living on the lower east side and represented the nearest thing to actual rapid transit Detroit ever had known.

Details of the express service on Jefferson Avenue were given in an article which was contributed to the ELECTRIC RAILWAY JOURNAL, issue of Jan. 7, page 4.

Present Eight-Cent Fare in St. Louis to Continue

The present fare on the lines of the St. Louis Public Service Company in St. Louis, Mo., of 8 cents or two tokens for 15 cents will continue for at least another six months from Jan. 5, when the original order expired, since the city is not ready to proceed with the hearing of the valuation upon which to establish a permanent fare.

Last July the city, through its counselor, asked that the hearing be postponed until it could check additions and betterments to the properties claimed to have been made during the receivership. This check has not been completed.

Joseph H. Grand, city attorney for University City, has asked the Missouri Public Service Commission to abolish the extra fare charged passengers who transfer from the Delmar-Olive to the Creve-Coeur Lake line for points in University City.

Chicago Parking Ban is Boon to Car-Riders and Pedestrians

Because of the new no-parking ordinance which became effective on Jan. 10, downtown Chicago has become not only a speedier place to ride in but a safer place to walk in, according to E. J. McIlraith, traffic engineer of the Chicago Surface Lines. On this matter he is reported to have said:

> The rule has increased the safety of street car passengers and of pedestrians. For one thing, motorists in the "Loop" have more room for driving—they have more chance to maneuver on the downtown streets without endangering anyone. That factor has increased general safety. Furthermore, pedestrians who cross streets or prospective passengers about to board street cars now have better visibility and therefore greater safety than when long lines of automobiles parked at the curbs blocked their view.
>
> As to the speed and regularity of surface lines transportation there is no doubt that the parking ban has helped. It has practically eliminated street car jams in the "Loop." And it must be remembered that eliminating jams in the "Loop" means increasing the regularity of service not only downtown but throughout the city.

The new regulation has not been in force long enough, Mr. McIlraith believes, to determine accurately its effect on the volume of railway riding.

A few downtown business houses have reported an increase in patronage and some a slight falling off in business since the Loop streets were cleared of parked cars, but the consensus so far is that the law should be given a fair trial before it is repealed or permanently adopted. Acting on protests which he had received, principally from small "Loop" stores, however, Alderman J. J. Coughlin introduced a resolution in the City Council on Jan. 16 asking that interests opposed to the enforcement of the ban be given an early hearing by that body. The resolution was referred to a sub-committee on traffic regulation.

New York's Comptroller Has Plan

Tentative draft prepared of proposal he feels would solve transit problem. Commission's counsel dissents

COMPTROLLER BERRY of New York and his advisory committee on transit have prepared a report favoring the maintenance of the 5-cent fare for a trial period of three years and the submission of the fare question to the people of the city in a referendum at the end of that period if found necessary. This is the position which has been taken by Mayor Walker. The report also recommends unification of the city's transit lines and the creation of a "Transit Authority," with powers similar to those of the Port of New York Authority, to take over the unified system and lease it to an operating company.

The report also recommends limitation of the profit of the operating company and provides for ultimate ownership of the transit lines by the city when the securities issued in payment for the properties of the Brooklyn-Manhattan Transit Corporation and Interborough Rapid Transit Company, in case their purchase is consummated, shall have been retired.

Comptroller Berry's present position, as indicated by the tentative report of his advisory committee, is said to be in line with the views of Mayor Walker and Mr. Delaney with the possible exception that the Berry committee report seems to recommend the inclusion of the surface lines, to which the Mayor and his advisers are said to have been opposed. It was suggested, however, that this might be subject to adjustment either by the city buying the surface lines at a price low enough to make their operation no great burden on the city or by an agreement to exclude the surface lines. The pending negotiations with the B.-M. T. have been on the basis of purchase of the rapid transit lines only.

One of the phases of the question on which the committee and the comptroller have not reached a definite conclusion is the organization of the company to operate the proposed unified system. It is assumed that any plan proposed would call for some combination of the B.-M. T. and the Interborough, but it is possible that a new operator might be sought. Under the terms of the proposed bill this would be a matter for the decision of the Transit Authority, perhaps with the concurrence of the Board of Estimate. Section 2 in the tentative report, not yet been drafted, probably will refer to the operating company.

On the comptroller's advisory committee are Jesse I. Straus, head of R. H. Macy & Company; Gen. George A. Wingate, surrogate of Kings County, and Elisha Walker, head of Blair & Company, bankers.

Comptroller Berry's plan to include surface lines in any proposal put forward for the unification of transit facilities would kill the 5-cent fare or

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load the city budget with deficits, Samuel Untermyer said on Jan. 24. Among other things he said:

The Legislature has intrusted the preparation of the plan to the Transit Commission and not to the Comptroller. Why does he not leave us in peace to work out this plan? When it reaches the Board of Estimate he has three out of sixteen votes for the adoption or rejection of the plan.

If he has any suggestions that would aid the commission, why does he not submit them there instead to the newspapers? If, when the plan is formulated, he does not like it, perhaps he will try his hand at another, provided his colleagues in the Board of Estimate do not adopt the commission's plan.

Meantime we are kept working overtime explaining away his constant digs at everything that is being done or attempted to be done.

One Cent an Hour and Insurance Granted in Chicago

The arbitration award which settled the wage question on both the Chicago Surface Lines and the Chicago Rapid Transit systems was announced on Jan. 21 by the two arbitrators, Guy A. Richardson, vice-president of the Surface Lines, and Alderman Oscar Nelson, representing the employees. While the award is made in the case of the Surface Lines, the Chicago Rapid Transit Company and employees abide by its terms.

Under the terms of the award, the employees receive in addition to the $1,000 life insurance and $20 a week sick benefit indemnity, 1 cent an hour increase in wages beginning June 1 and another cent beginning June 1 next year. The insurance, which is to be considered wages, amounts to approximately 1½ cents an hour. The agreement runs until May 31, 1930.

In lieu of insurance from June 1, last, to Feb. 1 this year, trainmen who were in service on June 1 receive $35 in cash and those who entered the service between June 1 and Nov. 1 receive $12 in cash. This is done because it is practically impossible to make insurance retroactive. The amount of cash given the trainmen is approximately the amount of money it would have cost the Chicago Surface Lines in case the insurance had been in effect since June 1. Working conditions were not involved in the arbitration and remain the same. The present wage of Chicago Surface Lines trainmen is 75 cents an hour. Following the award granting to trainmen on the Chicago Surface Lines $1,000 in life insurance and $20 a week sick benefit, the management of the Surface Lines has announced that the insurance benefits will be extended to all of the 16,500 employees of the company. This insurance will cost the company about $650,000 annually.

The Chicago Rapid Transit employees are not affected by the clauses relating to insurance as they were granted insurance the previous year by the company.

Under the provisions of the agreement for arbitration signed by union and company officials, it was understood that Messrs. Richardson and Nelson should proceed with the arbitration and reach an agreement if they could. In case they were able to agree they were empowered to make the agreement run until May 31, 1930. If they could not agree they were to select a third man and in that case the agreement could extend only to the end of the current fiscal year, ending June 1, next.

The union men asked for an increase of 15 cents an hour and the insurance features.

Rapid Transit Line to Flushing Opened

Rapid transit was extended on Jan. 21 over the Queensboro lines to Main Street, Flushing. Steinway Tunnel trains from Times Square, and Brooklyn, Manhattan Transit trains from Queens Plaza operate through to Main Street, Flushing. Second Avenue elevated trains will turn at Willetts Point Boulevard until such time as additional equipment is installed at the Flushing Terminal to accommodate them. Steinway Tunnel trains and the B.-M. T. trains will give a 3½-minute interval out of the Flushing Terminal during rush hours.

The Flushing Extension is approximately nine-tenths of a mile in length. The Queensboro Subway is one of the original lines provided by the Dual Contract, executed in 1913, but as originally planned, the Corona branch of the line ended at Alburtis Avenue, 1½ miles distant from Flushing. The Transit Commission in 1921 authorized the extension of the line from Alburtis Avenue to Main Street, Flushing. Contracts for the construction were awarded by the commission in 1922, but were not approved until 1923.

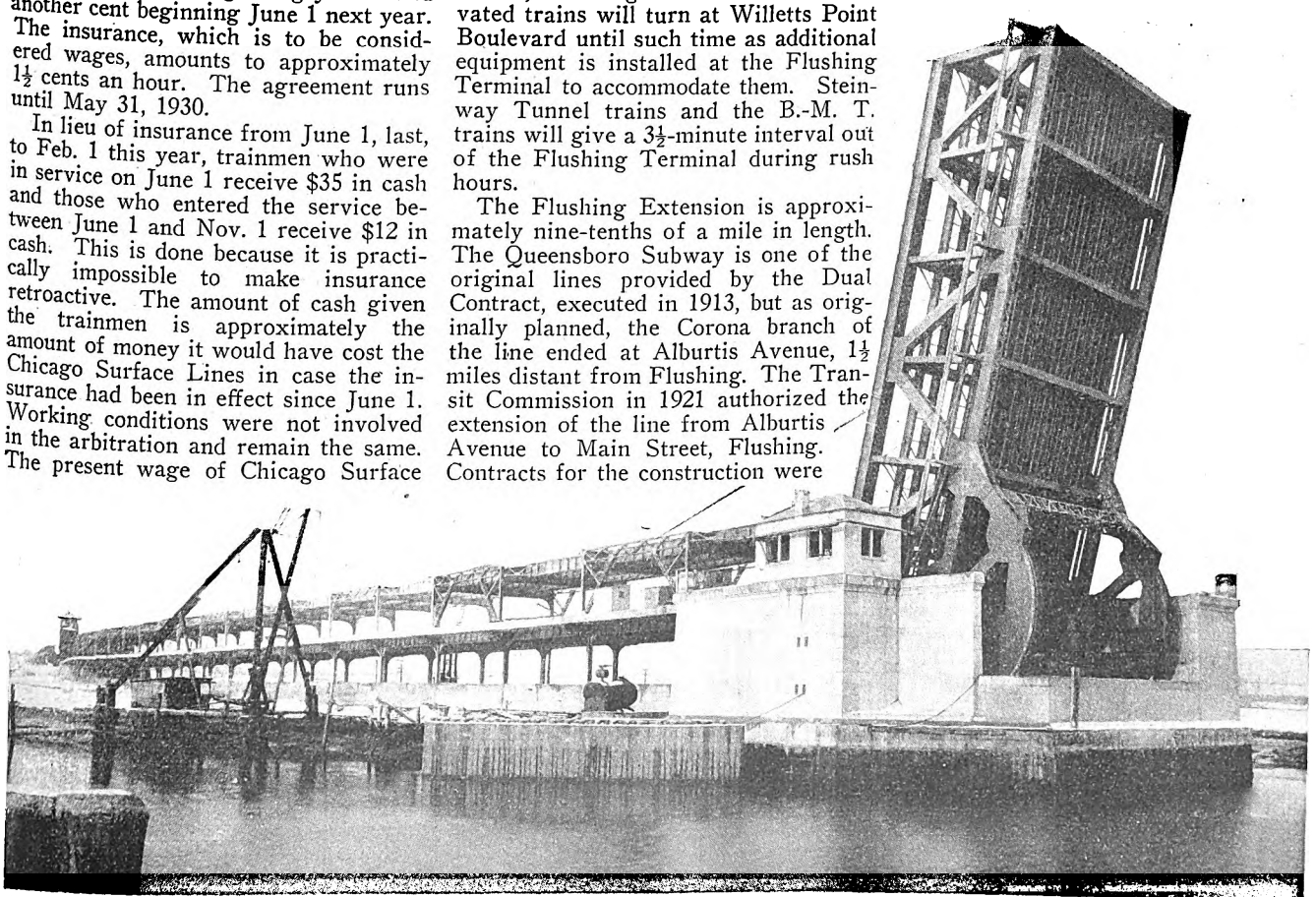
The extension is an elevated railroad running from the former terminus of the line at Alburtis Avenue, crossing Flushing Meadows and over Flushing Creek by bridge, and then by subway to Main Street, Flushing. Owing to the nature of the ground in Flushing Meadows, the completion of the line was delayed for almost a year. When the structure was first erected, it was found that the pillars supporting it, at a point near Flushing Creek, had settled perceptibly, and that it would have been dangerous to institute train operation over it. The structure, however, was found to be sound as far as Willetts Point Boulevard, and train operation to that point was started.

On the Flushing line, across Flushing River, is the Roosevelt Avenue Bridge, the largest trunnion bascule lift bridge east of Chicago and probably the largest of its exact type in the world.

An unusual feature of this bridge is that it is double-decked. The upper level will carry three rapid transit railroad tracks and the lower will provide a very much needed vehicular thoroughfare for this locality.

The clear height of the bridge is 25.6 ft., above mean high water, which is sufficient to permit the passage of ordinary tugboat traffic without opening the bridge. The Arthur McMullen Company was the general contractor and the McClintic-Marshall Company fabricated and erected the steel superstructure.

The bridge and approaches cost $2,700,000.



Roosevelt Avenue Bridge on Flushing Rapid Transit Line

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Paving Schedule in Detroit Amounts to $4,000,000

A schedule calling for the paving between tracks on approximately 50 miles of streets in Detroit, Mich., has been worked out by Del. A. Smith, general manager of the Detroit Department of Street Railways, according to an announcement by the department to the Detroit City Council. The estimated cost of the improvement is approximately $4,000,000. Mr. Smith said that the lack of paving on the various streets scheduled to be paved is reducing the usefulness of the streets and impeding the progress of the railway system.

A reduction of $2,500,000 in the department's gross earnings during the year 1926 hampered the expansion work, but it is anticipated that conditions will probably be such this year as to permit carrying on a large portion of the work. One of the larger projects scheduled for completion first is the section of Woodward Avenue between the Six Mile and Eight Mile Roads.

The proposal voted upon by the Detroit electors, which would have relieved the Detroit Street Railway of the expense of paving between tracks, was defeated by a substantial majority, although it was pointed out by the sponsors of the proposition that electric railways in many of the larger cities had been relieved of the burden, which was a relic of the days when the street cars were drawn by horses.

Unified System for Oklahoma City Advocated

George A. Henshaw, a retiring receiver of the Oklahoma Railway, Oklahoma City, Okla., issued a formal statement to the press on Jan. 9, expressing his appreciation of the co-operation of city officials and the newspapers in connection with the affairs of the company under the receivership. Mr. Henshaw served jointly with the late John W. Shartel, and after Mr. Shartel's death with G. T. Lackey. When the company went into receivership three years ago it was rapidly losing money, but the receivers in that short period, by intelligent management and by cultivating the good will of the public, were able to place the system on a paying basis. Mr. Henshaw, in his statement, praises the present officials and employees of the company, declaring them to be highly efficient and urges the advisability of keeping the entire transportation system of Oklahoma City in the hands of one company.

New Franchise Urged for Grand Forks

The necessity for a new franchise if service to Grand Forks, N. D., is to continue was stressed recently by T. J. Smith, president, and M. M. Odegard, manager of the Grand Forks Street Railway. Urging the granting of the franchise sought, the president said the company could survive only if put on a business basis, which included a fair return to the stockholders. He said that the state charter, which expired this year, should be extended, and this required the two-thirds vote of the stockholders. A reasonable return could be assured the stockholders by relieving the company from the paving and repair charges which have been imposed during the past fourteen years.

Mr. Odegard said that $50,000 to $100,000 should be put into additional equipment within the next ten years.

Weekly Pass in Ohio for $3.50

The Stark Electric Railroad since Jan. 23 has been offering a new weekly pass good between Alliance and Canton, Ohio, a distance of 18 miles, for $3.50.

Regular fare for a ticket over this line is 50 cents one way, or a bargain rate of 70 cents a round trip.

This ticket is of benefit to railroad and shop workers, who live in Alliance and work in Canton. It will also aid lawyers, court attendants and others since cars of the interurban stop in front of the County Court House.

$7,000,000 for Transportation in New Jersey

Budgets for 1928 of the operating companies of Public Service Corporation of New Jersey representing a total of approximately $37,000,000 have been approved. This expenditure is required for betterments in the transportation and other service supplied in New Jersey. Approximately $7,000,000 has been apportioned for transportation purposes for new equipment, replacements and general improvement of service.

Frank Hedley in Profile in the "New Yorker"

The soul of another millionaire strap-hanger has been laid bare—this time through the pages of the *New Yorker*. A personage no less imposing than Frank Hedley, president and general manager of the Interborough Rapid Transit Company, is made the subject of a sketch which condoles, condones, cavils, and caricatures the operating head of a great rapid transit system.

Like many others who inspire success stories this rapid transit genius comes from a family of workers. He himself left his home in England at the age of twenty and started at work in this country at $2.40 a day in the Erie Railroad machine shops in Jersey City. And now at the age of 66 he goes down to 165 Broadway every day with the inclination and ability to scrutinize detailed reports of delays and minor accidents of the previous day which occurred on a system over which he has assumed control for the past 24 years.

If Frank Hedley's name is associated with present-day transit trials, nevertheless it will be something to conjure with in the future planning of transit development.

Staggering To and From Work in New York

The stagger system was tested in New York on Jan. 23. Instead of reporting at 9 or 9:15 o'clock, as usual, the 10,000 employees of the Metropolitan Life Insurance Company arrived in four groups, the first at 8.30, the others at 8.45, 9 and 9.15. The first group went home at 4 o'clock in the afternoon and the rest followed at fifteen-minute intervals.

After watching in operation this plan he has sponsored for relieving subway congestion in rush hours, Dr. Louis I. Harris, Health Commissioner, said he would ask Mayor Walker to use his influence to obtain city-wide adoption of the stagger system. He expressed a special desire to see the Amalgamated Garment Workers, involving close to 100,000 persons, put it into effect. He said:

> I am going to make a report to Mayor Walker and ask him to use his influence in bringing home the value of the plan to industrial groups and accelerating city-wide adoption. I will suggest it also on behalf of the city employees, a fair fraction of whom are concentrated during the day.

Previous to Jan. 23 7,000 of the Metropolitan employees reported at 9 o'clock and 3,000 at 9.15. The 9 o'clock group is now reduced to about 3,000 and the other 7,000 are divided into three groups approximately equal in number.

$3,000,000 Spent by the Pacific Electric Railway in 1927

More than $3,000,000 was expended during 1927 in additions and improvements to various properties on the system of the Pacific Electric Railway, Los Angeles, Cal. As much or more will be necessary to provide for further planned improvements during 1928.

Outstanding in the improvements made in 1927 was the extremely large volume of trackage renewed with heavier rail. Throughout the system a total of 26,400 ft. was replaced.

The erection of two major grade separations, Pico Street and Hyperion Avenue, were the outstanding hazard removing additions during 1927. Four streets were separated by these two projects. Further safety measures were provided through the installation of 55 automatic wig-wag devices over the system, bringing the total of these devices to 555 now employed to warn of approaching trains.

New passenger station facilities were provided at the Hill Street subway station, at Santa Ana and at Pasadena, while at Long Beach a pretentious rebuilt station was completed. In addition numerous shelter stations were erected at various points over the system.

Other important improvements designated to improve the service were: new substations at San Gabriel, five de luxe motor coaches, overhead reconstruction and miscellaneous additions and improvements to bridges, buildings and other structures over the system.

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Opposition Filed to Kansas City Short Line Project

Briefs urging the denial of a certificate of convenience and necessity to the St. Louis-Kansas City Short Line Railroad, which seeks permission to build an electric line between the two main cities of the state, have been filed by counsel for steam railroads operating between St. Louis and Kansas City with the Missouri Public Service Commission.

Six steam railroads would be affected adversely by the new line. The commission denied the application made in 1925 because the electric railway failed to make a proper showing of financial ability to carry through the project.

Lease for Suburban Service in Minneapolis Renewed

The Minneapolis, St. Paul & Suburban Railway, subsidiary of the Twin City Rapid Transit Company, Minneapolis, Minn., in suburban service, has renewed a lease made in March, 1906, with the Chicago, Milwaukee & St. Paul Railroad of the Minnetonka branch to Deephaven. It branches from the Excelsior line of the surburban company more than a mile west of Hopkins, and thence runs along the south shore of Lake Minnetonka. The lease has a 60-day written release clause by which either the railway or the railroad may cancel it. This formerly was a well-patronized steam line.

Interchange of Power Arranged at Providence

A frequency changer installed by the United Electric Railways, Providence, R. I., will permit an interchange of power between the company and the Narragansett Electric Company, both controlled by the Rhode Island Public Service Company. The interchange is planned only for emergency needs, with the railway intended as the principal beneficiary, since it puts at the railway's disposal all the available power of the electric company including that brought down from New Hampshire. The railway operates on 25 cycles, whereas the Narragansett power is of 60 cycles.

During rush hours the railway station is worked to capacity, while at off times during the day it is run light.

Eight Cents Sought in Ottawa

An 8-cent fare or seven tickets for 50 cents has been asked of the Dominion Board of Railway Commissioners by the Ottawa Electric Railway, Ottawa, Canada. The present fare is 5 cents.

Some time ago the company formally notified the city that it proposed to apply for an increase in fare for the five years beginning Aug. 14, 1928. It proposed a 7-cent fare or four tickets for 25 cents for adults, from six in the morning until midnight. For children instead of a 3-cent fare the company suggested a 4-cent fare or seven tickets for a quarter. No change was considered in the after midnight fares, 10 cents cash.

That application has apparently been amended to request an increase greater than was originally intended.

Only One Amendment at a Time in St. Paul

The Charter Commission at St. Paul, Minn., has rejected the proposal by the City Council to have the voters act upon an amendment to the charter at the March 13 primary election, which would put the city in the position of being able to indulge in bus operation on its own account. The Charter Commission feared that such presentation would militate against passage by the voters of a proposed amendment to enable the Council to give the railway relief from some of the burdensome costs of operation, such as was suggested by the State Commission two years ago when it ordered the present rate of fare of 8 cents and six tokens for 40 cents. The amendment has been voted down twice at previous elections.

Intracity bus operation is now a monopoly of the Twin City Motor Bus Company, a subsidiary of the Twin City Rapid Transit Company, as part of the intercity system. The revenue is included in the railway returns and any move that would tend to reduce the revenue of the St. Paul City Railway would simply be an argument for increased fare before the State Commission.

Furthermore the Charter Commission wishes the question involved in the railway amendment to be determined on its merits unhampered by other issues. The work of completing paving on streets that carry street car lines now awaits a clear cut verdict by the voters on the amendment intended to grant relief to the company from this burden.

The special committee of the Charter Commission held to the opinion that to submit a companion amendment would be an invasion in spirit at least under which the city has agreed to co-operate in giving the railway amendment a fair and impartial test at the polls.

In commenting upon the theory of proponents of the bus amendment that it is merely an enabling act that does not commit the city to bus operation, the committee said:

> The answer to both arguments is that as a weapon the amendment cannot be effective unless it carries the authority to issue bonds without further vote of the people. No less an economic problem than that of municipal ownership is involved in the present situation. We do not believe that a matter so serious and far-reaching should be submitted without the most careful thought and the widest possible public discussion. Linked with other questions it cannot have that attention.

Lucky Riders in Richmond

Richmond, Va., shoppers on Friday shopping tours will ride free on a street car under a new system just put in effect by the Virginia Electric & Power Company. Every Friday the company will designate one car on some one of its divisions "The Lucky Shopper," and anyone boarding that car between the hours of 10 a.m. and 4 p.m. will be treated to a free ride at the expense of the company. When the passengers board they will be greeted by the motorman: "You're a lucky shopper, the ride's on us."

The experiment was started on the Highland Park Forest Hill line on Jan. 20 when the 258 passengers who rode were given pamphlets entitled "You're a Lucky Rider."

There is no distinguishing mark on the free car. As indicated in the newspaper advertisement the feature is designed to speed up shopping between 10 a.m. and 4 p.m.

Whether to Smoke to Be Voted Upon in Maine Sections

The smoking problem is to be voted upon by patrons of the York Utilities Company, which operates between Sanford and Biddeford, Me. Suitable ballots are to be provided, which may be marked "yes" or "no," and deposited in boxes to be placed on all buses and trolleys.

William M. B. Lord, general manager, has declared he does not know whether the people who ride in buses and cars wish to smoke en route and is taking this means to find out.

New Plan to Save Hocker Line

Efforts looking toward the restoration of service on the Hocker line, officially known as the Kansas City, Lawrence & Topeka Electric Railroad, may yet be successful as a result of a conference between officials of the Sonken-Galamba Corporation, purchaser of the line, and officials of the Kansas City Public Service Company.

Under a plan for assisting in the financing of the line and putting it into operation offered the Sonken-Galamba officials by the railway, it was agreed to purchase $15,000 in bonds providing the Sonken-Galamba Corporation took $16,000 in bonds; to furnish power for the line at cost and to lease four street cars to the line. Engineers of the Kansas City Public Service Company estimate that rehabilitation would cost approximately $16,000. The railway in Kansas City would receive a percentage of city fares on the line, which would run from the city market in Kansas City to Rose Hill, Kan.

Herman Sonken, president, said the Sonken-Galamba Corporation would accept the plan providing the communities along the line subscribed to $10,000 in preferred stock of the new company. To this the towns have agreed. The Hocker Line is twenty years old.

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Recent Bus Developments

Higher Fares in Westchester

The Westchester Street Transportation Company, Inc., controlled by the Third Avenue Railway System has been authorized by the Public Service Commission to increase its fares on five days' notice on its White Plains-Tarrytown line from 5 to 10 cents in the zone between the New York Central station in White Plains and the west line of Elmsford and between the east line of Elmsford and the end of the line in Tarrytown. This company succeeded the Westchester Street Railroad, the property of which went into the hands of a receiver and was sold at mortgage foreclosure.

Evidence before the commission showed that on the lowest valuation of the company's property used in providing transportation service claimed by Tarrytown and Greenburgh, the two objecting communities, the new rates proposed would not provide revenue sufficient to pay operating expenses and a reasonable return on such valuation It was also shown in the evidence that for the three months ended Sept. 30, 1927, the operating expenses and tax a day amounted to $334, while the operating receipts were $251. The operating statistics of the company, as submitted, were not challenged by the communities after their accountant had examined the books of the company.

Bus Succeeds Batavia Traction

After nearly six months without transportation facilities, the city of Batavia, N. Y., is to have a bus line as a successor to the Batavia Traction Company, which was forced to give up last summer because of failing revenue.

Earl P. Churchill and Arthur H. Sands, Batavia residents, have received a permit to operate a bus line and have purchased two 34-passenger buses. Messrs. Churchill and Sands, the holders of the new permits, expect to start operation of the bus service on a Main Street route at once.

Bus Rights Incite Trouble in Toledo

A petition which sets up ten violations of various state laws, city ordinances and regulations of the Ohio Public Utilities Commission has been filed by the Community Traction Company, against the Sylvania Buses, Inc., operator of a short interurban line from Sylvania into Toledo. Cancellation of the permit under which the bus line operates is asked.

The Sylvania Buses, Inc., has been competing with the railway on intracity business and was the chief offender against the ordinance passed by the city a year ago seeking to bar interurban buses from handling city passengers. Its recent application for permission to put on four new coaches was denied by the Public Utilities Commission. It was brought out at the hearing that one of these buses had been operating for several months and in the petition just filed it is claimed that equipment has been operated though not certificated, not insured or bonded under the utilities regulations. Violations of schedules and routes, and of the prohibitory ordinance of Toledo, are also cited as offenses which should be penalized by withdrawal of the company's certificate of convenience and necessity.

Buses on Alameda Line as an Experiment

Permission to discontinue operation over a portion of its San Jose Avenue line in the city of Alameda has been granted the Key System Transit Company, Oakland, Cal., by the California Railroad Commision. A trial is to be made of bus service for a period of 60 days.

Bus Service Extended in San Antonio

Regular bus service between Main Plaza and Kelly and Duncan Air Fields, San Antonio, Tex., is being supplied by the San Antonio Public Service Company. The fare is 25 cents cash or five tickets for a dollar.

Franchise Sought in Louisville

Grant would contain two general provisions: A city-wide operating right and regulation of that right administered by city. Statement of company's position in matter

THE Louisville Railway, Louisville, Ky., is asking for the creation and sale of a bus franchise. It suggests a city-wide operating right of a nature that, if acquired by it, will enable it to "use the new type of gasoline street car" to supplement and extend the transportation system now conducted by it by means of electric street cars. It assigns four reasons why it should have a bus franchise and why that franchise should be city-wide in its scope. Those four reasons are:

1. An analogy to the city-wide operating rights of all other Louisville utilities.
2. That, by using the new vehicle, it may round out and extend its present street car service.
3. That the dominant characteristic of the new vehicle, its mobility, may be invoked to the maximum benefit of operating company and traveling public.
4. That it may be protected from purely destructive competition.

PROTECTION ASSURED TO CITY

The company suggests that the broad operating right may well be protected by city executive restrictions to be imposed in respect of:

1. Starting bus routes—agreement.
2. Modifying routes in operation—discretion of company subject to.
3. Stopping bus routes—option of either city or company. As a corollary and to protect capital to be invested, initial right to extend automatically on future grant of competitive right.

Lastly, the company wants to combine capital and operation of electric street car and bus lines to the end that it may operate one complete and combined transportation system and not two competitive enterprises.

In its request to the city the company says:

The situation is this. A new type of street car has been developed. It is of advantage both to the transportation company and to the city that this new type vehicle be utilized for the service of the traveling public.

In order to operate this new type vehicle a franchise is necessary. Any bus franchise that carries over the fixed route idea of the rail street car line will automatically rob both company and public of that one character that makes the bus worth while, its mobility. A flexible franchise is necessary then for the operation of a flexible transportation line.

What safeguard should be interposed for the protection of the city? This is suggested: No line can be started without city assent; any line can be stopped by city fiat. In this state of case the city has parted with nothing it cannot take back. As far as the company is concerned it must and it is willing to stand or fall on its future showing of useful service; its operation is legalized and its investment depends upon its own ability to perform. The city risks nothing and the company backs itself.

Assuming a franchise created and acquired, how best to proceed?

The particular sections or routes where buses should be operated as well as the territory where parallel non-competitive service might be offered can be determined only after careful study and numerous experiments. For the good of both city and company the experiments should be as few and inexpensive as possible and advantage should be taken of all available studies of the city and its transportation system. It happens that within the past year a very careful and complete study has been made of these very things by at least three able and independent engineers.

The railway has retained John W. Burke, an engineer of wide experience, to revise its estimates of reproduction cost and sound value, while the city has engaged the Beeler Organization for the same purposes. These two, working independently, have made careful and complete studies of the city and the railway system. The company suggests their wide experience in matters of operation, car routing, etc., could be easily and promptly made available. It says:

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There has also been completed a traffic survey covering the entire problem of surface traffic by Mr. Segoe, whose report to the Mayor's traffic committee is the basis of the traffic ordinance now pending.

Messrs. Burke, Beeler and Segoe have made independent studies of the cities' traffic problems from separate viewpoints and under separate engagements, and their data and studies, together with those of the railway, represent the expenditure of at least $150,000 for collection of such data. With so large and comprehensive a mass of data available it would be most unwise and improvident to submit to the method of trial and error problems of service and routing which might be solved in conference.

Much time and expense might be saved were these gentlemen engaged to make a recommendation as to routes and operations not merely of buses but of electric cars as well. With the studies of the railway itself could be combined the ideas and suggestions from these independent sources to the end that a complete co-ordination of electric car and bus service be worked out in the most expeditious and most economical manner. The observation of like operation in other communities which Messrs. Burke, Beeler and Segoe have had opportunity for, could be constructively applied to the situation existing in Louisville with the result of saving both time and expense in arriving at that plan of operation for Louisville transportation which would be most useful to the public and most productive to the company.

Concise Form of Franchise Submitted

The company attached to its communication to the city a concise form of franchise under which the developments suggested in its appeal could be accomplished. The suggested period of duration of the franchise is twenty years. On the matter of fares the proposed grant read:

Section 4.—Rate of Fare.—The holder of this franchise may charge and collect toll during the first two years operation hereunder at a rate not exceeding 10 cents for each passenger carried within the city limits with free transfers between bus lines.

Provided: If this franchise be acquired by a person or corporation operating, in Louisville, a system of electrically propelled street cars running on rails, or by a subsidiary of such corporation, then,

(a) Such person or corporation shall give transfers from bus to electric car or vice versa and may charge not exceeding 10 cents for a single bus ride, which shall carry transfer privilege to electric cars and not more than the differential between the electric car fare actually paid and the bus fare for a transfer from the electric car to bus, and shall give transfers at no extra charge from bus line to bus line.

(b) The rate of fare to be charged for bus rides shall be controlled in the same manner and upon the same principles as may govern the fixing of electric car fare.

(c) In adjustment of either bus fare or electric car fare, or both, the fixing of the rate or rates of fare shall be based upon the combined properties in electric railway service and bus service and through consideration of the expense of both operations, and not either or both fares upon consideration only of one group of property or expense. Determination of the fair value of property used and useful in bus service rendered hereunder shall be made under the direction of city authorities and the reasonable expense of such determination shall be borne by the holder hereof. Such valuation shall be undertaken immediately upon the acquisition of this franchise, shall be completed within 90 days, and shall have the same force and effect as the similar valuation of the properties devoted to electrically propelled car service, and fare adjustments may be made at any time after the completion of said valuation without regard to the two-year provision above mentioned. Said valuation shall be made and applied without sacrifice or surrender of any rights of owner or city under the law of the land. In such adjustments of fare, or fares, the charge for transfer between like or unlike vehicles shall be subject to adjustment upon the same condition or conditions as the base fare or fares.

Mayor Favors a Monopoly in Transportation

If bus and railway lines are co-ordinated under a bus franchise to the Louisville Railway, the fare should not be more than 7 cents, the present car fare, Mayor Harrison said on Jan. 23 in discussing the bus situation. The Mayor also announced that the basic principle of any bus franchise that he approves and signs must be that the city shall have a "direct right and means to compel" the buyer of the franchise to operate buses over Louisville streets wherever they are needed. In the opinion of the Mayor, with the buses and street cars operating as one unit, there would be no occasion for a higher fare than is charged at present.

No date had been set for the next conference of city officials with representatives of the company. When the latter believe they have arrived at a proposition which might be acceptable to the city or when city officials have worked out details of a possible solution, there will be further meetings, the Mayor said.

The Mayor favors a thoroughly regulated monopoly in principle, but said that if a monopoly on transportation is granted in a franchise the public should be protected to a greater degree than would appear to be possible in the company's proposal.

Bus Connections at Champaign and Danville with Interurban

Additional bus line connections at Champaign and Danville are now offered by the Illinois Traction System, Springfield, Ill. At Champaign the Pierce Arrow Bus Line Company, Inc., is operating bus service between Urbana-Champaign and Chicago. The buses of this company have their terminal at the Illinois Traction System station in Champaign, and schedules are so arranged that direct connection is made with Illinois Traction trains.

At Danville, Ill., the Egyptian Transportation System has started bus service connecting Danville, Lawrenceville and Albion, making connection at the latter point with other bus service of that company to Eldorado, Hillsboro, Vienna, Metropolis and Paducah, Ky. Buses of this company leave the Illinois Traction System station at Danville at 7 a.m. and 3:30 p.m. No passengers are carried on these buses between Danville and Ridgefarm. Tickets and baggage checking are handled at the Illinois Traction System station in Danville.

Buses for Marinette and Menominee

The Wisconsin Public Service Corporation, Green Bay, Wis., will spend $95,000 for new buses to be operated in the cities of Marinette, Wis., and Menominee, Mich., according to the 1928 budget of the company. All electric railway property in these two cities will be abandoned and sold. The total value of the railroad property to be supplanted by the buses was carried on the books at $435,000, divided as follows: tracks and roadway $307,000, buildings and shops $10,000, electric distribution equipment $33,000, and operating equipment $85,000.

New Bus Proposals Planned in Kansas City

Officials of the Kansas City Public Service Company, Kansas City, Mo., are working on the new bus plans to be presented to the City Council when the franchise expires.

These recommendations are said to have been decided upon, although it is probable that others will be added:

A new alignment of trunk lines, short enough to be profitable, and extending direct from the population centers to the downtown district.

Possibly purchase of new equipment.

New feeder lines to unserved sections, calling for the purchase of at least a dozen light buses.

Suggestion of a new trunk line fare, probably 15 cents or two rides for 25 cents.

Some substitution for present unprofitable Country Club Express service.

Feeder line fare to remain unchanged at 10 cents, with transfer privilege.

According to President Powell C. Groner, it may be a matter of weeks before he and his associates will be ready to go before the City Council with the new bus plan. It is felt that the main trunk lines which compete with existing railway service should be self-supporting, that those who choose to ride on a pneumatic-tired bus with a seat guaranteed, should pay a fare sufficient to meet the operating cost.

As for the feeder lines which supplement the railway Mr. Groner desires an extension of feeder lines, with a retention of a 10-cent fare and transfer privileges. At least a dozen new light buses will be needed.

After the company has worked out a conception of an adequate co-ordinated transportation system, public meetings will be held by the Council to develop other ideas.

Would Operate Coach Service in Glendale

The Pacific Electric Railway has applied to the California Railroad Commission for a certificate of public convenience and necessity to operate motor coach service in the city of Glendale.

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Financial *and* Corporate

Improvement in Toledo in December—Year's Figures

For the first time in two years the monthly report of the Community Traction Company, Toledo, Ohio, showed a surplus. For December the amount was $2,807, due in part to the increased holiday business and to the readjustment of funds at the close of the year. There were carried on the system 4,167,159 passengers compared with 4,456,993 for a similar month the previous year.

Motor coach operation there accounted for 292,917 revenue passengers. They paid an average of 8.349 cents each, but operations resulted in a deficit of $4,360.

The year showed a deficit to the stabilizing fund after taking care of all ordinance requirements. This amounted to $361,825 compared with a deficit of $253,952 for the previous year. Most of this difference was directly attributable to decrease in riding due to prevalence of more privately owned automobiles in the city, bus competition, and slump in industrial conditions over recent months. Total operating revenue for 1927 was $3,408,386 compared with $3,539,774 the previous year. Total expense of operations was $2,615,184 for 1927 compared with $2,659,982 for 1926. One cut of $120,000 in maintenance was made during the year.

Passengers carried in 1927 numbered 47,033,227 compared with 50,011,654 the previous year. The company operated 6,388,975 revenue car-miles and 1,031,827 revenue coach-miles in 1927, and the previous year operated 6,667,419 revenue car-miles and 338,769 revenue coach-miles.

The ratio of expense and taxes in Toledo to total operating revenue was 81.294 in 1927 as against 80.310 in 1926.

Youngstown Line Bought

Control of the Youngstown & Suburban Railway, running from Youngstown to Leetonia, has been purchased by Samuel Insull & Son of Chicago. The line was originally built to connect the local steel district with the Ohio River, but was later electrified and operated as a passenger line.

New Deal in San Antonio

The San Antonio Public Service Company, San Antonio, Tex., plans to take over the assets of the South Texas Public Service Company and the Comal Power Company, which will be dissolved. The former will be known as the South Texas Department of the San Antonio Public Service Company, while the power station at New Braunfels will be known as the Comal Plant of the San Antonio Public Service Company. There will be no change in management or operating force of the two companies, due to the consolidation.

Purpose of City Utilities Company Explained

St. Louis Public Service Official States Case for Company to Act for Large St. Louis and Kansas City Holders

THE relations between the St. Louis Public Service Company, which operates the railway lines in St. Louis and St. Louis County, Mo., and the City Utilities Company, which has asked the Missouri Public Service Commission for permission to hold 40 per cent of the common stock of the operating company, have been described by Stanley Clarke, executive vice-president of the St. Louis Public Service Company, in a statement issued to the press. He said in part:

City Utilities Company, a Delaware corporation, has asked permission to own approximately 40 per cent of our outstanding stock. From facts already stated informally it appears:

1. That five or six large New York holders of our stock and 80 or 90 holders living in St. Louis wish to put their stock into a corporate unit. No one of them as an individual is able personally to look after his investment in our company or to afford alone the cost of employing competent employees to look after his investment in our operating company.

Therefore, these stockholders wish to form a pool to bear proportionately among themselves the expense of protecting their respective investments. Perhaps these stockholders should have unrestricted confidence in the operating managers of the railway to protect the investment of all stockholders; but their desire to have personal representatives keep track of their affairs is at no cost to anyone but themselves. Furthermore, any aid or assistance of a financial or other character which the corporate unit formed by these stockholders and its representatives is giving to our company is at the sole expense of these particular stockholders and no expense to the car rider.

2. This City Utilities Company is not a holding company in the usual sense in which that term is used, because it does not seek to own a majority of the outstanding capital stock of our company.

3. Not a cent of the expense of the City Utilities Company is paid by our company.

There are, however, many benefits which will accrue to our company if permission is granted to these 80 or 90 of our stockholders to put their stock into a unit, regardless of what name that unit is called.

To improve the service in St. Louis our company needs large sums of money. As an executive, I know the difficulty of securing funds with which to make improvements in service. Until the average investor believes what we now believe, namely, that when the public receives good service it will be willing to pay what it costs, our company must borrow from such people as are willing to invest more money to give better transportation, believing that by doing so they will safeguard the investment they already have.

Our company was able to borrow $1,000,000 unsecured, from the City Utilities Company made up of our stockholders.

The Public Service Commission of the state of Missouri would have no control over the corporate unit owning shares of our outstanding stock, and this would be true, regardless of whether such corporate unit was a foreign corporation or a Missouri corporation. The reason is that the jurisdiction of the Public Service Commission of Missouri is confined to operating public utilities, and its duties are to protect the users of the service furnished by such utilities.

The City Utilities Company is seeking to hold 40 to 42 per cent of the stock of the St. Louis Public Service Company not for the purpose of controlling the St. Louis railway system, but for certain advantages to be derived by the group forming the company and by other stockholders of the operating organization and the public. Col. Albert T. Perkins, vice-president of the utilities company, so declared in a deposition given to City Counselor Muench of St. Louis on Jan. 18. Colonel Perkins' testimony will be sent to the Public Service Commission at Jefferson City.

Advantages to be gained by the utilities company holding from 40 to 42 per cent of the operating company stock are listed by Colonel Perkins as follows:

Its officers could watch over and safeguard interests of stockholders, thus relieving individuals of that responsibility.

The company could render financial aid to the operating company by obtaining credit with greater facility and at lower interest rate.

The company could advise and assist the operating company on transportation problems and other matters.

Colonel Perkins stated that already the City Utilities Company has loaned the Public Service Company $1,000,000 to aid in the reorganization of the city lines. The holding company acquired no security and is charging only 5½ per cent interest. He said the operating company would have been forced to pay a much higher rate of interest had it secured the money elsewhere.

Colonel Perkins said that the $1,000,000 was obtained from the Central Union Trust Company, New York, after the utilities company put up sufficient securities as collateral. He said that no charge for services rendered the railway has been made to date and no charges for future services are under contemplation at the present time. He added, however, that if specific work is called for on a large scale outside of the general advisory functions a proper charge will undoubtedly be made.

Counselor Muench for the city endeavored to show that if the holding company could control the operating company it could also fix the value of the service rendered. He said:

If you control the election of directors and elect a friendly board, then, of course, you could rely on the board employing the holding company to render services rather than an outside company.

"Far-fetched, but possible," Colonel Perkins replied.

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Extension Granted to West Chester Holders

An extension has been granted until Jan. 31 to security holders of the West Chester Street Railway, West Chester, Pa., in which to deposit their holdings under the terms worked out for the readjustment of the securities of the company. The time limit fixed originally for such deposit was Dec. 31, 1927. Announcement has been made that a large part of the securities have already been deposited. The appeal is addressed to the holders of the first mortgage 5 per cent gold bonds, due Aug. 1, 1932, first lien and collateral trust sinking fund gold bonds, Series A 6 per cent, due Oct. 1, 1939, 7 per cent participating cumulative preferred stock, common stock and secured promissory notes.

Spokane United Railways in Merger Deal

H. T. White, New York, chairman of the finance committee of the Washington Water Power Company, Spokane, Wash., and officers of the American Power & Light Company on Jan. 18 stated that subject to necessary corporate action and legal arrangements, it has been agreed that all holders of Washington Water Power common stock will be offered an opportunity for prompt exchange of their stock for American cumulative preferred stock no par value, paying $6 a share annually, in the ratio of 2.2 shares of American stock for each share of Washington Water Power common stock. The offer is conditioned on acceptance by a sufficient percentage of the shares of water power common stock.

According to a statement to the New York Stock Exchange, the American Power Company's authorized $6 no-par cumulative preferred stock would be increased from 500,000 shares to 2,000,000 shares and the authorized no-par common stock, from 2,300,000 shares to 4,000,000 shares.

While a merger of the Washington Water Power Company with American Power, now under way, would require the issue of a considerable amount of American Power preferred stock, it is not believed this would account for the proposed increases in American Power's capitalization. There are $23,091,400 par value of Washington Water Power common shares outstanding. If all these are deposited under the merger offer, there would be 508,000 shares of American Power required for their exchange.

The Washington Water Power Company owns a controlling interest in the Spokane United Railways.

Interest on Chicago Railways Bonds Ordered Paid

Payment of interest due on Feb. 1 on $55,655,000 of first mortgage 5 per cent bonds of the Chicago Railways, Chicago, Ill., was ordered by Federal Judge Wilkerson in the United States District Court. In the matter of interest on $37,941,275 of junior mortgage bonds, also due at that time, the receivers were directed to hold sufficient funds for interest on those issues if the court should order payment, after deciding certain points in controversy.

Discontinuance of Non-Paying Line in California Refused

Reaffirming its stand against permitting a utility to abandon its non-paying properties, and to retain only paying properties, the California Railroad Commission denied the application of the Central California Traction Company to abandon service over its Sunnyside Line, partly within and partly outside the city of Stockton. The commission found that public convenience and necessity required the operation of the line in question, since patrons would be required to walk more than ½ mile if service were withdrawn.

In accepting the franchises, the commission ruled, a carrier obligated itself to furnish service to the community as a whole. Further it was almost universal that railways in furnishing such service expected and often operated non-paying ends of lines. In the present case the applicant leased to the Stockton Electric Railroad all of the existing local system covered by these franchises, with the exception of the line on which it now sought to discontinue passenger service. In the opinion of the commission it was possible that the Central California Traction Company was unfortunate in that it had retained a decidedly unremunerative portion of that system; but the fact that it had chosen to divest itself of the better paying lines was no adequate reason why the public, who depended on the non-paying end for service, should suffer. The commission stated that its policy had never been to permit railways to select for operation only the income-producing portions of their lines and abandon those portions which, because of their distance from the center of population or because of other reasons, were not, in themselves, self-supporting.

New Interests in Groton & Stonington Road

F. E. Kingston & Company, New Haven, Conn., have acquired the majority of the first mortgage bonds and the shares of stock of the Groton & Stonington Traction Company, Norwich, Conn. Sale of the mortgage bonds and stock of the company was made on the advice of the stockholders' protective committee and represents the holdings of 75 per cent of the stockholders. The protective committee was named two years ago following default of interest by the Groton & Stonington Street Railway. The Kingston company paid $425 for each $500 first mortgage bond, with which was included ten shares of stock.

P. LeRoy Harwood has resigned as treasurer and director, and Lucius E. Whitton, New London, and Clarence Thompson, New Haven, have resigned as directors.

Conspectus of Indexes for January, 1928

Compiled for Publication in This Paper by

ALBERT S. RICHEY

Electric Railway Engineer, Worcester, Mass.

	Latest	Month Ago	Year Ago	Since War: High	Since War: Low
Street Railway Fares* 1913 = 4.84	Jan. 1928 **7.59**	Dec. 1927 **7.57**	Jan. 1927 **7.42**	Jan. 1928 **7.59**	May 1923 **6.88**
Electric Railway Materials* 1913 = 100	Jan. 1928 **140.6**	Dec. 1927 **140.6**	Jan. 1927 **156.0**	Sept. 1920 **247.5**	Dec. 1927 **140.6**
Electric Railway Wages* 1913 = 100	Jan. 1928 **228.6**	Dec. 1927 **228.4**	Jan. 1927 **226.6**	Sept. 1920 **232**	March 1923 **206.8**
Am. Elec. Ry. Assn. Construction Cost (Elec. Ry.) 1913 = 100	Jan. 1928 **200.9**	Dec. 1927 **200.7**	Jan. 1927 **203.5**	July 1920 **256.4**	May 1922 **167.4**
Eng. News-Record Construction Cost (General) 1913 = 100	Jan. 1928 **203.9**	Dec. 1927 **203.9**	Jan. 1927 **211.5**	June 1920 **273.8**	March 1922 **162.0**
U. S. Bur. Lab Stat. Wholesale Commodities† 1926 = 100	Dec. 1927 **96.8**	Nov. 1927 **96.7**	Dec. 1926 **97.9**		
Bradstreet Wholesale Commodities 1913 = 9.21	Jan. 1 1928 **13.57**	Dec. 1 1927 **13.53**	Jan. 1 1927 **12.82**	Feb. 1 1920 **20.87**	June 1 1921 **10.62**
U. S. Bur. Lab. Stat. Retail Food 1913 = 100	Dec. 1927 **155.9**	Nov. 1927 **156.5**	Dec. 1926 **161.8**	July 1920 **219.2**	March 1922 **138.7**
Nat. Ind. Conf. Bd. Cost of Living 1914 = 100	Dec. 1927 **163.6**	Nov. 1927 **164.2**	Dec. 1926 **168.4**	July 1920 **204.5**	Aug. 1922 **154.5**
Steel Unfilled Orders (Million Tons) 1913 = 5.91	Dec. 31 1927 **3.973**	Nov. 30 1927 **3.454**	Dec. 31 1926 **3.961**	July 31 1920 **11.118**	May 31 1927 **3.051**
Bank Clearings Outside N. Y. City (Billions)	Dec. 1927 **19.89**	Nov. 1927 **19.50**	Dec. 1926 **19.76**	Oct. 1925 **20.47**	Feb. 1921 **10.43**
Business Failures Number	Dec. 1927 1818	Nov. 1927 1660	Dec. 1926 1979	Jan. 1924 2231	Aug. 1925 1353
Liabilities (Millions)	**52.21**	**39.23**	**91.88**	**122.95**	**27.22**

*The three index numbers marked with an asterisk are computed by Mr. Richey, as follows: Fares index is average street railway fare in all United States cities with a population of 50,000 or over except New York City, and weighted according to population. Street Railway Materials index is relative average price of materials (including fuel) used in street railway operation and maintenance, weighted according to average use of such materials. Wages index is relative average maximum hourly wage of motormen, conductors and operators on 136 of the largest street and interurban railways operated in the United States, weighted according to the number of such men employed on these roads.

†This index is changed to a base of "1926 = 100." That notation replaces the former basis of "1913 = 100." Inasmuch as the bureau has not calculated the index on this new base any further back than January, 1923, no figures are shown in this tabulation for the high and low points since the war. It is planned to compute the index on the new basis as far back as January, 1913. Until such time as the bureau makes public these figures for the earlier years this information will be lacking.

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Default of Interest Looms on Puget Sound Electric Railway

Semi-annual interest due last Aug. 1 on the $2,427,000 bonds of the Puget Sound Electric Railway has not been paid, and default looms again on Feb. 1, when next bond payments are due. It is problematical, executives admitted recently, whether the Tacoma Railway & Power Company will be able to pay interest due on April 1 on its $1,200,000 bonds. Principal on this entire bond issue is due April 1, 1929.

The Tacoma Railway has operated for some years without a franchise under varying plans intended to put the property on a paying basis. Mayor M. G. Tennant expresses the conviction that eventually the city will operate its system of transportation. The city's position, he states, now is that before it can arrive at any satisfactory relations with the Tacoma Railway & Power Company the company will have to change its valuation at Olympia for rate-making purposes.

The circumstances surrounding the affairs of the Puget Sound Electric Railway were reviewed at length in ELECTRIC RAILWAY JOURNAL for July 30, 1927, page 209.

Another Merger Proposal in Washington

Merger discussions at Washington, D. C., were revived on Jan. 20 when Major Clayton E. Emig, former vice-chairman of the public utilities committee of the Federation of Citizens' Associations, submitted to John W. Childress, chairman of the Public Utilities Commission, a brief outlining his own ideas for bringing about the long-advocated consolation.

Major Emig referred to his plan as "suggestions on merger of Washington's transportation lines." It appears, however, to contain a combination of the cardinal features of the three different schemes for consolidation proposed by Harley P. Wilson, owner of the Washington Rapid Transit Company; B. BcK. Bachman, chief accountant of the Public Utilities Commission, and Charles Hansel, specialist. The latter firm, it was recalled, prepared a merger plan at the instance of Major Emig for the utilities committee of the federation.

Major Emig borrowed from the Hansel plan the idea of extensive use of one-man street cars, which he said would save the consolidated company $900,000 a year. From the Wilson plan he took the $50,000,000 valuation for a merged company and a return of 7 per cent, which he said should be guaranteed for a period of 50 years. The Bachman plan was quoted for authority that under merged operations the companies could save $1,500,000 a year.

Meanwhile representatives of the Washington Railway & Elcetric Company, the Capital Traction Company and the Washington Rapid Transit Company have been holding conferences on the merger subject and the merger sub-committee has been functioning at the instances of the board of directors of the three systems affected.

Banker Takes Up Preferred Issue of Railway in Receivership

Several hundred Des Moines investors in 7 per cent preferred stock of the Des Moines City Railway, Des Moines, Ia., now in receivership, will receive the par value of their stock together with accrued dividends up to Jan. 1, 1928, through the almost unprecedented generosity of A. W. Harris, Chicago, chairman of the board of the Harris Trust & Savings Bank, trustee of both the bonds and the debentures of the railway. He has authorized the Iowa National Bank, Des Moines, to take up the $100,000 of outstanding stock in the hands of local purchasers at the original cost to them, and in addition to pay dividends up to the first of the year 1928.

Mr. Harris was, of course, under no legal or moral obligation to redeem the stock, as the receivership was unforeseen at the time the stock was sold and resulted from no action of his. However, those who know his feelings in the matter declared the banker was unwilling that Des Moines patrons of the company should lose through their purchase of stock, and that he was determined to keep their confidence.

Homer Miller, president of the Iowa National Bank, said that so far as he knew, the action of Mr. Harris was without precedent in American business, and that it proved beyond a doubt the integrity of the man who has backed the Des Moines railway for years past.

The stock was sold in 1922 and 1923 following the granting of the present service-at-cost franchise in the latter part of 1921. The sale resulted in a wide distribution of the stock locally, and did much to build up the strong public sentiment which now registers in Des Moines for the city railway company.

The stock would probably have been a complete loss to the buyers, with the exception of the dividends which have been paid regularly, except for the generosity of Mr. Harris. The railway will undoubtedly go to sale under the receivership, and few in touch with the situation believe that the amount realized will more than cover the first mortgage bonds and the debentures.

W. H. Sawyer Made Receiver of Ohio Road

Judge Frank M. Krapp of the Common Pleas Court of Springfield, Ohio, on Jan. 26 appointed W. H. Sawyer, Columbus, receiver for the Springfield Railway. The proceedings were brought by the Transit Improvement Company, to which the Springfield Railway owes $680,000 and which has acquired and now owns the stock of the railway. A large part of the money owed to the Transit Improvement Company was advanced for bond interest and payment for franchise tax and paving assessments.

It is hoped by those interested in working out the difficulties of the Springfield property that the city and the receiver will join in a survey of the entire problem with a view to giving Springfield the best practicable service and putting the company in a financially healthy condition so that it may be able to finance new improvements and furnish service beneficial to the community.

Notes for Fort Worth Public

The Northern Texas Traction Company, Fort Worth, started the sale of 6½ per cent, 3-year notes to the public on Jan. 26. The total issue is $1,500,000, of which $1,000,000 is being taken by bankers and $500,000 is to be placed locally with the public at a price of 98 per cent of par.

Removal Sought of a New York City Line

Purchase and removal by New York City of the Madison Avenue line of the New York & Harlem Railroad is asked in an application filed with the Board of Estimate, it was announced on Jan. 20 by the Fifth Avenue Association.

$1,250,000 Power Issue Offered

Whitaker & Company, St. Louis, Mo., and W. L. Ross & Company, Chicago, Ill., are offering at 100 and accrued interest, to yield 5.25 per cent, $1,250,000 of Oklahoma Power Holding Company first (closed) mortgage 5¼ per cent sinking fund gold bonds dated Jan. 3, 1928, and due Jan. 1, 1943. The proceeds of the sale of the bonds will be paid to the Oklahoma Railway as part of the purchase price of the property.

The Oklahoma Power Holding Company was organized under the laws of Delaware in December, 1927, to acquire the electric power plant heretofore owned and operated by the Oklahoma Railway, Oklahoma City. The property consists of a modern plant located at Oklahoma City with a present installed capacity of 13,750 kw.

The property is leased under a contract to the Oklahoma Gas & Electric Company, for a period of 22 years, for a basic annual rental of $225,000, plus taxes and full maintenance. The Oklahoma Gas & Electric Company also assumes the contract between this company and the Oklahoma Railway covering all the latter's power needs.

The bonds will constitute, in the opinion of counsel, a first mortgage on all the property of the company, subject to the contract to furnish the Oklahoma Railway its power requirements. A physical examination of the property by the engineering department of the Community Power & Light Company showed a present depreciated value of $1,714,751. The entire issue of common stock of the Power Holding Company is controlled by the Oklahoma Railway.

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Personal Items

Promotions and Appointments in Brooklyn

IN RECOGNITION of worthy records five employees of the Brooklyn City Railroad, Brooklyn, N. Y., were promoted Jan. 1. These men and their new positions are as follows:

R. A. Masters, superintendent of transportation.

F. J. Brennan, assistant superintendend of transportation.

L. H. Hoyer, division superintendent at Fresh Pond.

E. M. Fletcher, depot master at Fresh Pond depot.

L. H. Hoyer and L. E. Loomis succeed Messrs. Masters and Brennan. E. M. Fletcher succeeds Mr. Hoyer as depot master at Fresh Pond depot.

James J. Duffy was appointed supervisor of employment and school for conductors and motormen.

R. A. Masters, the newly-appointed superintendent of transportation, has had nearly 25 years of experience in the railway industry. He started work as a conductor in 1904 with the Indianapolis Traction & Terminal Company, where he remained for three years. He then entered the interurban field as conductor on the Ben Hur Route between Indianapolis and Crawfordsville. At that time Clinton E. Morgan, vice-president and general manager of the Brooklyn City Railroad, was general manager of this line. From 1909 to 1910 Mr. Masters worked as fireman on the "Big Four" division of the New York Central lines. He returned to the electric railway field in 1910 with the Union Traction Company at Indianapolis. Three years later he went to Jackson, Mich., to work for the Michigan United Traction Company and the Michigan Railroad, finally supervising operation of this company's line between Grand Rapids and Kalamazoo.

Mr. Masters joined the organization of the Brooklyn City Railroad in January, 1920, and has been division superintendent in charge of the Halsey Street division and later the Fresh Pond division. His headquarters will be at 85 Clinton Street.

On Mr. Masters' staff will be F. J. Brennan, assistant superintendent of transportation, who will also have charge of the traffic bureau and the schedule department. Mr. Brennan was advanced to this rank from the position of division superintendent at Maspeth. His assistant also has had varied experience in surface car operatino, but all in New York City. He began his railroad career in 1905 as a motorman at 58th Street depot. After a year he resigned but returned in 1907 as a motorman. In 1909 he was transferred to the Ninth Avenue depot, where he served as a stenographer and mileage computor. In 1911 he was appointed to the Public Service Commission staff as inspector of surface car operation, and was promoted finally to the post of supervisor of inspectors by the Transit Commission.

Men Advanced by the Brooklyn City Railroad

1. Leo E. Loomis
3. L. H. Hoyer

4. R. A. Masters
6. E. M. Fletcher

2. F. J. Brennan
5. J. J. Duffy

Mr. Brennan returned to the Brooklyn Company in 1921 as supervisor of headways, and later was in charge of operation for the Brooklyn Bus Corporation, a Brooklyn-Manhattan Transit subsidiary. From March, 1925, until January, 1927, he was superintendent of maintenance and operation of the Municipal Trolley Lines on Staten Island. A year ago he became division superintendent at Maspeth depot.

Mr. Brennan is a native of Brooklyn. He was graduated from Erasmus Hall High School and also studied at Pratt Institute.

Mr. Hoyer, the new division superintendent at Fresh Pond, advances to his post as division superintendent from that of day depot master at Fresh Pond depot. His railway career also dates from 1904, when he started as a conductor in Manhattan. He went to Brooklyn in 1905 and has served ther as motorman, instructor of motormen, inspector of instructors and depot master and has worked at the East New York, 23rd Street, Ridgewood, Flatbush and Fresh Pond divisions.

Mr. Loomis, appointee to the Maspeth station, goes to the Brooklyn City

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organization from the West. For the past sixteen years he has been with the Michigan Electric Railway, Jackson, Mich. He first served the company as conductor and motorman in Battle Creek, beginning in March, 1911, and after two years was promoted to interurban motorman. During the year 1917 he was made train dispatcher and rapidly rose to be chief dispatcher. In 1923 he accepted the position of superintendent of the city car lines in Jackson, Mich. Just prior to going to Brooklyn, Mr. Loomis was superintendent of the bus line subsidiary of the Michigan Electric Railway, the Southern Michigan Transportation Company.

Edward M. Fletcher, now depot master at Fresh Pond, started in the railway industry in September, 1913, in the office of the general manager of the Virginia Railway & Power Company, at Richmond. In June, 1918, he began his apprenticeship in the operating field as a conductor, motorman and operator, and from January, 1922, until October, 1925, he served as a line inspector during morning and evening rush hours. He resigned his position with the Richmond property in November, 1925, to accept a position on the staff of the vice-president and general manager of the Brooklyn City Company.

Mr. Fletcher was born in Richmond. He attended public and private schools there.

James J. Duffy, now supervisor of employment and school for conductors and motormen, has spent his entire career as a railway operator on the Brooklyn surface lines. He was appointed motorman at Canarsie depot on Feb. 3, 1906. He advanced through the ranks of register taker, starter and register inspector at Canarsie depot in the next eight years and after a short period as a road inspector at Halsey Street depot, was made chief instructor at the 58th Street schoolroom on March 16, 1915. Mr. Duffy has spent the last thirteen years in the instruction branch of the service.

C. C. Slater President in Columbus

C. C. Slater, formerly vice-president and general manager of the Columbus Railway, Power & Light Company, Columbus, Ohio, was elected president at the annual meeting of stockholders and directors on Jan. 24. He succeeds Cyrus S. Eaton, of Cleveland.

Lyle Babbitt, secretary and auditor, will also serve as vice-president.

A. C. Beck, formerly assistant treasurer, is now treasurer.

Arthur dur Perron Succeeds Paul Seurot at Montreal

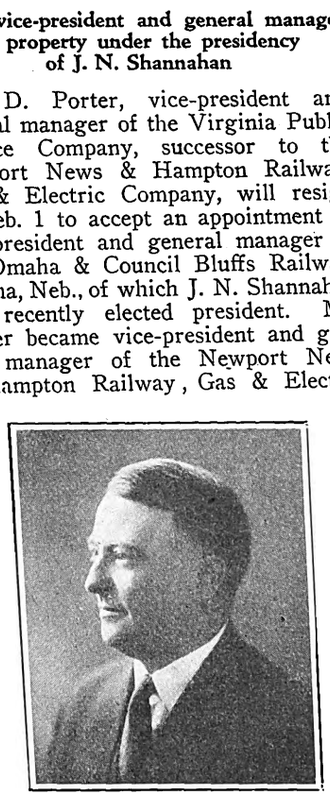
Paul Seurot, chief engineer of the Montreal Tramways Commission, has resigned in order to accept the position of rapid transit engineer for the Montreal Tramways, Montreal, Que.

Arthur dur Perron, civil engineer. Montreal, and professor of engineering at the Montreal Technical School, has been appointed chief engineer to succeed Mr. Seurot.

C. D. Porter Goes to Omaha

Made vice-president and general manager of property under the presidency of J. N. Shannahan

C. D. Porter, vice-president and general manager of the Virginia Public Service Company, successor to the Newport News & Hampton Railway, Gas & Electric Company, will resign on Feb. 1 to accept an appointment as vice-president and general manager of the Omaha & Council Bluffs Railway, Omaha, Neb., of which J. N. Shannahan was recently elected president. Mr. Porter became vice-president and general manager of the Newport News & Hampton Railway, Gas & Electric



C. D. Porter

Company in April, 1921, succeeding E. F. Peck, who was compelled to give up active work on account of ill health.

Mr. Porter was in charge of track construction in Washington, D. C., under Mr. Shannahan, after which he went to the New York Central as location engineer in charge of field work. Later he returned to be chief engineer of the Newport News & Hampton Railway, Gas & Electric Company, where he was in charge of all physical property and its upkeep. When Mr. Shannahan was elected president of the Maryland Electric Railway of Baltimore, Mr. Porter went with him as vice-president and general manager of its interurban line between Baltimore and Annapolis, remaining with that company until its absorption by the Washington, Baltimore & Annapolis Electric Railway. Upon completion of his work there Mr. Porter succeeded Mr. Peck on the Newport News & Hampton property and was with that company during the reconstruction period immediately succeeding the War.

In the recent utility mergers this property was absorbed by the National Public Service Company and Mr. Porter was retained as its vice-president and general manager, resigning to serve again with his former employer, J. N. Shannahan, in his work in Omaha.

The new assistant in Omaha is 44 years old. He is a graduate civil engineer of Renselaer Polytechnic Institute.

G. C. Baggett Named Superintendent of Houston Interurban

Grover C. Baggett has been promoted to the superintendency of the Galveston-Houston Electric Railway, Houston, Tex. In this capacity he succeeds Superintendent Howard, who left the services of the company some time ago.

Mr. Baggett went to Houston from Alabama in 1909 and became a conductor on the local railway lines. Two years later he was made a conductor on the interurban lines. In 1915 he was promoted to the position of dispatcher for the interurban and remained in that capacity until 1925 when he was made chief dispatcher.

Nomination of C. R. Porter to I. C. C. Approved

Approval was given Jan. 20 by the Senate Interstate Commerce Committee to the nomination of Claude R. Porter of Iowa to succeed Henry Hall of Colorado as a member of the Interstate Commerce Commission.

W. V. Drake in New Post With Monongahela Power System

W. V. Drake has been selected to fill the newly created position of superintendent of power plants of the Monongahela System according to a recent announcement at the office of Captain G. M. Alexander, president of the Monongahela West Penn Public Service Company. Mr. Drake, who will be located in Fairmont, already has assumed his new duties. For the past seven years he has been assistant to J. E. Thomas, superintendent of power plants for the West Penn Power Company, with main plants at Springdale and Connellsville, Pa.

Mr. Drake was named for the new position by H. A. Holmes, Fairmont, general superintendent of the power department. He stated that the new official would have general supervision of the operation and maintenance of all power plants of the company. These plants are located at Rivesville, Hundred, Parkersburg, Elizabeth, Grantsville and Sutton.

MAXWELL DABRITZ, former conductor on local lines of the International Railway, Buffalo, N. Y., has been appointed district manager in charge of the Seneca station. The new manager entered the employ of the International Railway in 1912. Two years later he was promoted to station clerk at the Hertel station and in 1927 was made master of the Hertel station. In his new capacity Mr. Dabritz succeeds District Manager Hooley of the Seneca station, who has been transferred to the Hertel station, succeeding John Reichel, who has been appointed special investigator.

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Manufactures and the Markets

Details of $1,170,669 Expenditure by Narrow-Gage Line

Data have been filed by the Boston, Revere Beach & Lynn Railroad with the Massachusetts Department of Public Utilities covering the estimate of the cost of electrifying the road. The total cost figure is placed at $1,170,669, divided as follows:

Car equipment	$597,564
Substations	215,769
Trolley line and feeders	124,850
Turnstiles and station changes	58,961
Signal changes	177,500
Track bonding	18,700
Buses and truck	22,325
Shop machinery and tools	15,000
Total	$1,230,669
Estimated salvage from sale of steam locomotives	60,000
Net total	$1,170,669

The details of the car equipment expenditure of $597,564 broken down into individual items follow:

CAR EQUIPMENT	
60 Passenger Motor Cars	
Electric equipment at $3,975	$238,500
Air brakes at $925	55,500
Trucks at $985	59,100
Heaters at $275	16,500
Labor at $1,200	72,000
Painting at $300	18,000
Installing leather seats twenty cars at $624	12,480
Six Work Motor Cars	
Electric equipment at $6,800	$40,800
Air brakes at $875	5,250
Trucks (two) at $985	5,910
Labor at $1,300	7,800
Six Passenger Trailers	
Heaters at $275	$1,650
Equipment at $250	1,500
Air brakes at $925	5,550
Painting at $300	1,800
Labor at $150	900
Total for all cars	$543,240
10 per cent for engineering contingencies, freight and overhead expenses	$54,324
Total	$597,564
Buses and Truck	
Three coaches, 23-passenger, street car type, six cylinders at $6,275	$18,825
One 2-ton truck	3,500
Total	$22,325

The so-called narrow-gage road passed recently to the control of Hemphill & Wells, New York, as told in detail in ELECTRIC RAILWAY JOURNAL for Dec. 10, page 1076.

Committee Approves Minneapolis Street Railway Budget

The street railway committee at Minneapolis, Minn., has approved a $705,000 budget expenditure for 1928 by the Minneapolis Street Railway. Four extensions of existing lines include: Chicago Avenue, six blocks; Bloomington Avenue, four blocks, eliminating the present line on Cedar Avenue from 50th to 52nd and on 52nd to Bloomington; Nicollet Avenue line, four blocks into the newly acquired Richfield district; Bryn Mawr, six blocks; doubling track five blocks on Washington Street NE.; doubling track West Broadway Penn Avenue to city limits. Other relaying of rails and special work will take the remainder of the budget.

Confer on Type of New Cars for Cincinnati Street Railway

Announcement was made on Jan. 18 at the offices of the Cincinnati Street Railway Co., that conferences are being held between officers of the company and various car builders concerning the purchase of new street cars for Cincinnati.

The matter has also been presented to Edgar Dow Gilman, director of public utilities, who will be called upon to approve both the type of cars and also the plan of financing their purchase.

Walter A. Draper, president of the railway, is reported to have said:

The policy of this company, when it took back the operation of its property a little more than two years ago, has been first to reconstruct a large portion of its track, and then to purchase new cars.

We have now proceeded so far with our track reconstruction program that I feel that the time has arrived for the purchase of new equipment to operate over the improved track.

While we have not decided on the exact type of car, we have been making a study of various types for several months, both here and elsewhere, and have been conferring with several car builders in order that our new cars may be the best and most efficient type obtainable.

Sales of Incandescent Lamps Increase in 1927

Sales of incandescent lamps in the United States during 1927 total approximately 320,000,000 large size and 218,000,000 small lamps, according to a review of the electrical industry for the year by John Liston of the General Electric Company. This is an increase of about 8,000,000, or 2½ per cent, in the large sizes over 1926 and 16,000,000, or 8 per cent, in the small sizes over the previous year.

Exhibitograph No. 2

HEARKEN

to the wee small voice that calls you to

Cleveland

Sept. 22-28, inclusive

When it urges you to plan for a display at the 47th convention and exhibit of the A. E. R. A. Do it now!

Meeting of New Exhibit Committee Called

Col. J. H. Alexander, chairman of the exhibit committee of the American Electric Railway Association, has called a meeting for 10 a.m. Wednesday, Feb. 8, at his office with the Cleveland Railway in the Hanna Building, Cleveland, Ohio.

This is the first meeting of this committee and is called for organization purposes, to approve layout and floor plan showing detailed space arrangements with booth dimensions for the convention at Cleveland next Sept. 22-28 inclusive, and to consider such other matters as might properly come before the meeting at that time.

New Managing Director for Westinghouse of Japan

At a recent meeting of the board of directors of the Westinghouse Electric Company of Japan, J. W. White was elected a director and managing director of that company.

Mr. White has been respectively general manager of the Japan company, manager of the power section of the Detroit office, and manager of the Westinghouse International Company of Cuba.

New Cars for New Orleans Ready

Delivery is being made of the first of the twenty new street cars for the New Orleans Public Service, Inc.

Details of these cars, ordered in Aug., 1927, were carried in the issue of the JOURNAL for Oct. 15, 1927. Ten of the cars were ordered from the St. Louis Car Company and ten from the Perley A. Thomas Car Company.

They are all-steel one-man two-man double-truck double-end cars. Each has a seating capacity for 52 passengers and weighs 40,000 lb. The cars are equipped with four treadles per car, one in each corner because of operating conditions on Canal Street in New Orleans.

Slightly Higher Metal Prices

The prices of copper, lead, zinc, and tin were all slightly higher Jan. 25 than a week ago, though the market had not been active.

Excellent sales in the export market during the last two or three days have been a marked influence in removing the pressure to sell on the part of the custom smelters. The copper that was available from such sources until Jan. 23 at 14 cents for Eastern deliveries is no longer obtainable, and all sales Jan. 24 and 25 have been on the 14⅛-cent, Valley, basis. From Jan. 19 to 23, inclusive, the larger lots were sold at or near the 14-cent level in the East and 14.20-cent in the Middle West, with occasional sales up to the 14⅛-cent level, at which some special lots were purchased.

Foreign prices continue unchanged at

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14½ cents, c.i.f., and from 14.25@14.35 cents, f.a.s.

Prices for lead, not only in New York and St. Louis but in London, are virtually unchanged from a week ago. The American Smelting & Refining Company has maintained its contract price in New York at 6.50 cents.

Sales of zinc, like those of copper, have been well below normal, with about 2½ points difference between sellers' and buyers' ideas of the market. Judging by the gradual advance in the price, from 5.60 to 5.65 cents, sellers apparently have had more ground for their belief than buyers. Jan. 25 some quotations were made as high as 5.675 cents.

The tin market is dominated by buyers rather than sellers. Recent reports of exceptionally small shipments from the Straits, which a year ago would have caused a sharp advance in London, had only a slightly bullish effect on the other side, and in the domestic market almost no effect at all. In spite of the fact that the current prices are about 13 cents under those of January, 1927, and 10 cents under the average for the entire year, consumers are not satisfied to consider it "cheap." They may be wrong, but they feel they can afford to take the chance. Consumption in the automobile industry and by the tin-plate interests has picked up materially, but at the same time there is every evidence of a higher production rate in the Far East, so that the relative position is little changed. Tin of 99 per cent grade brings within ½ cent of Straits.

Rolling Stock Replacements Planned in Port Arthur

Eastern Texas Electric Company, which purchased the railway property of the Port Arthur Traction Company at public auction on Jan. 10, plans to rehabilitate that property and improve the service. Most of the rolling stock of the company will be replaced with more modern equipment, and the service previously operated by the company will be supplemented with buses, which will be operated in territory not previously served. The Eastern Texas Electric Company operates the railway lines in Beaumont and an interurban line between Beaumont and Port Arthur.

METAL, COAL AND MATERIAL PRICES
F. O. B. REFINERY

Metals—New York	Jan. 24, 1928
Copper, electrolytic, cents per lb.	13.90
Copper wire, cents per lb.	15.875
Lead, cents per lb.	6.50
Zinc, cents per lb.	6.00
Tin, Straits, cents per lb.	55.375
Bituminous Coal, f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	.....
Somerset mine run, Boston, net tons	.....
Pittsburgh mine run, Pittsburgh, net tons	.....
Franklin, Ill., screenings, Chicago, net tons	1.70
Central, Ill., screenings, Chicago, net tons.	1.50
Kansas screenings, Kansas City, net tons.	2.125
Materials	
Rubber-covered wire, N. Y., No. 14, per 1,000 ft.	5.30
Weatherproof wire base, N.Y., cents per lb.	16.75
Cement, Chicago net prices, without bags	2.05
Linseed oil (5-bbl. lots), N. Y., cents per lb.	10.4
White lead in oil (100-lb. keg), N. Y., cents per lb.	13.25
Turpentine (bbl. lots), N. Y., per gal.	$0.645

ROLLING STOCK

PUBLIC SERVICE TRANSPORTATION COMPANY, Newark, N. J., has just placed an order with the Yellow Coach & Truck Manufacturing Company, Chicago, Ill., for 331 Yellow Type Z gas-electric buses, for use on its lines in Newark and other cities.

DEPARTMENT OF STREET RAILWAYS of the city of Detroit, it is reported, will ask for bids on 25 to 100 new motor coaches.

TWIN CITY RAPID TRANSIT COMPANY, St. Paul, Minn., has accepted delivery on six Mack bus chassis, 230-in. wheelbase, four-cylinder motors, model AB.

BOSTON ELEVATED RAILWAY, Boston, Mass., has accepted delivery of a White Model 50-B bus.

TRADE NOTES

RAILWAY TRACK WORK COMPANY, Philadelphia, Pa., has recently sold the Chicago Surface Lines a "Vulcan" rail joint grinder and three "Atlas" rail grinders.

NUGENT STEEL CASTINGS COMPANY, Chicago, Ill., has appointed Van Cortright Mekeel as special representative. Mr. Mekeel was formerly connected with the Taylor-Wharton Iron & Steel Company of High Bridge, N. J., as special research investigator, mechanical engineer and sales engineer.

FRANK W. GORMAN became associated on Jan. 1, 1928, with the Ohio Brass Company, Mansfield, Ohio, as district sales representative with headquarters in El Paso. Mr. Gorman, formerly with the Mine & Smelter Supply Company, El Paso, relieves L. M. Keating, who has moved to Mansfield, Ohio, to assume new duties in the general sales department of the Ohio Brass Company. The territory in which Mr. Gorman will operate includes Arizona, the Panhandle of Texas, New Mexico and Mexico.

TIMKEN ROLLER BEARING COMPANY, Canton, Ohio, announces it will occupy spaces Nos. 414-415 at the Mid-West Power Conference at Chicago, Feb. 14 to 18. Those representing the company at the exhibit will be L. M. Klinedinst, G. D. Thewlis, R. P. Proffitt, R. W. Ballentine, G. W. Curtis and R. P. Kelley.

COPPERWELD STEEL COMPANY, with the removal of its main office from Rankin to its new 20-acre mill at Glassport, Pa. announced that the headquarters of both the sales and engineering departments would be at Glassport. The personnel of these departments as now constituted, is as follows: Robert J. Frank, vice-president in charge of sales; Stanton Hertz, formerly electrical engineer, becomes sales manager; Rolf Selquist, formerly assistant electrical engineer, has been appointed electrical engineer; William Jay McIlvane has been appointed district engineer, with headquarters at New York, N. Y.; Erich G. Elg becomes district manager with headquarters at Chicago, Ill. The company has also recently announced that S. H. Burr has joined the engineering department of the company, with headquarters at New York. He was formerly inspector and line material specialist at both the Buffalo and New York offices of the Graybar Electric Company.

BRIDGEPORT BRASS COMPANY, Bridgeport, Conn., is opening a Boston office in its home territory. From the foundation of the company, in 1860, to the present time, New England industry has been serviced out of Bridgeport, and now the company, it is stated, finds it necessary to provide more and speedier service to its New England customers. In charge of the office will be William J. Hawkins, who has been associated with the company for more than twenty years. The office is in the Park Square Building, No. 1060, in the Back Bay District, a short distance from both the Copley Plaza and the Back Bay Station.

ADVERTISING LITERATURE

AMERICAN ASPHALT PAINT COMPANY, Chicago, has issued an artistic booklet entitled "In the Long Ago." The cover and text illustrations are the work of Lone Wolf, the Blackfeet Indian artist. A distinctive feature of the cover is an Indian teepee against a background of blue mountain ranges, that blend with other colors of green and black. The text deals with the discovery of "Gilsonite Asphalt" and with its history interwoven with the history and life of the West. Attention is directed in the booklet to the advantages of "Valdura Asphalt Paint."

DAYTON STEEL FOUNDRY COMPANY, Dayton, Ohio, has issued an illustrated folder devoted to a description of its improved Model 10 Dayton dual pneumatic steel wheel.

MURRAY CORPORATION OF AMERICA, INC., Detroit, Mich., has issued an attractive illustrated booklet devoted to a description of its bus coach work.

GENERAL ELECTRIC COMPANY, Schenectady, N. Y., has added to its loose-leaf advertising folders the following sheets: "Constant-Speed Direct Current Motors, Type CD"; "Type GTE Motors for Gearless Traction Elevators"; "Low-Speed Synchronous Motors, Types TS and QS"; "Hand Starting Compensators, CR1034-K17-K21 and K22"; "Type WD-300A Arc Welder"; "Low-Speed Direct Current Generators"; "Atomic Hydrogen Arc Welding Equipment"; and to its loose-leaf advertising sheets "Automatic Supervisory Equipment Selector Type"; "CR4409 Protective Panels"; "CR7006-D26 Magnetic Switch," and "Improved Brush-Holders for GE-70 and GE-80 Railway Motors." It is also sending out loose-leaf pamphlet entitled D. & W. oil fuse cutouts type D.

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BRILL

THE BRILL 1928 Model Electric Car, designed and built by Brill Engineers, is truly an outstanding example of present day electric car construction.

Performance tests prove conclusively that this car can easily equal the speed of other forms of city transportation. In addition, "The Car for 1928" conforms to the latest ideas in appearance, riding qualities, noise reduction and low power consumption.

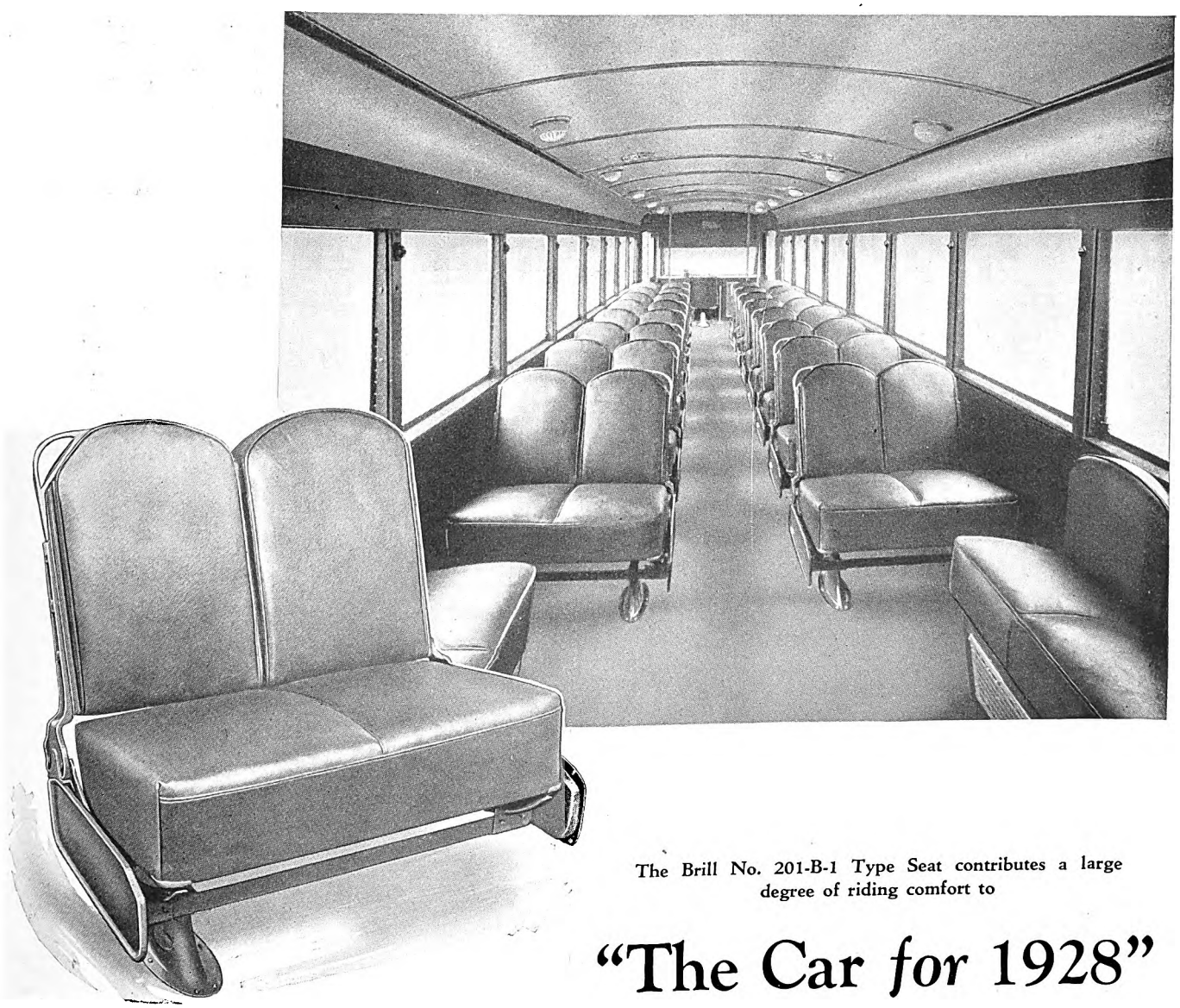
Write us for detailed specifications and performance facts.

The J. G. Brill Company
Philadelphia

American Car Company
St. Louis

The G. C. Kuhlman Car Co.
Cleveland

Wason Mfg. Company
Springfield, Mass.



The Brill No. 201-B-1 Type Seat contributes a large degree of riding comfort to

"The Car *for* 1928"

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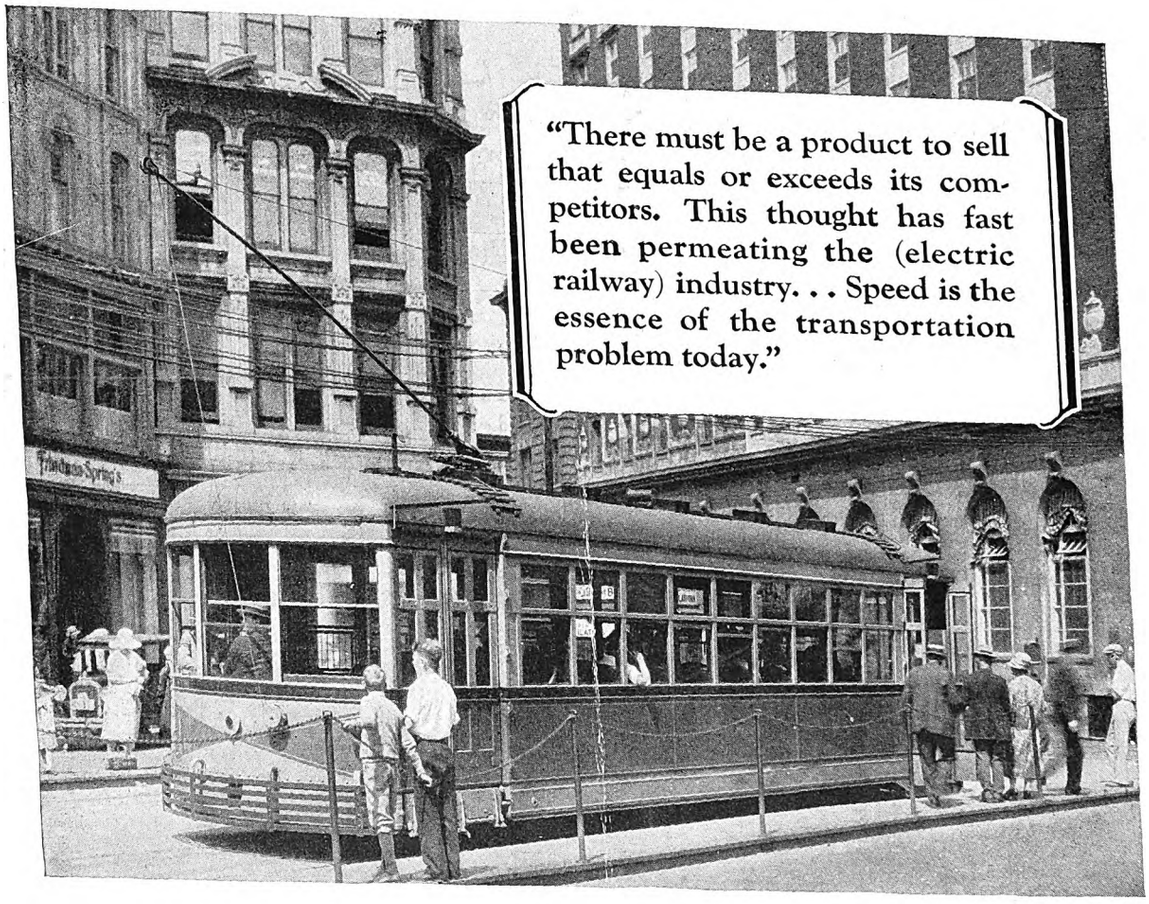

Step up the speed— step down the costs

Here you have in a few words the policy of the Grand Rapids Railway—an objective of every electric railway that aims to be progressive.

This company felt that the time had come for an entirely new street car, designed to serve and satisfy the riding public, and to have a better *net*-earning power. It has put in operation 27 new light-weight cars which embody the latest results of practical experience in the equipment of electric rail coaches, and which have

—developed schedule speeds of 9.5 miles per hr.
—decreased energy consumption over 40%
—increased passengers per car-mile over 60%

This is one of many instances in which G-E Equipment has had a part in demonstrating the earning possibilities of modern cars. Your G-E railway representative can give you maintenance figures for similar G-E Equipment covering a period of years.

The cooperation of General Electric is offered for the development of any improvement or the production of any electrical equipment necessary to a program of car modernization. Many instances can be cited in which modern G-E equipped cars have achieved notable savings or developed new sources of revenue.

330-27

GENERAL ELECTRIC

GENERAL ELECTRIC COMPANY, SCHENECTADY, N. Y., SALES OFFICES IN PRINCIPAL CITIES

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ELECTRIC RAILWAY JOURNAL

McGraw-Hill Publishing Company, Inc. FEBRUARY 4, 1928 Twenty Cents per Copy

Franklin

FEB 6 1928

a. c. f.

During 1927

Seventeen prominent public utilities invested over $2,500,000 in a. c. f. motor coaches.

The largest coach-operating electric railway in the country invested nearly $700,000 in a. c. f. coach equipment.

Two companies backed their opinion of a. c. f. motor coaches with over $200,000 in cash.

Two others invested over $100,000.

Four more each invested over $75,000 in a. c. f. motor coaches.

Eight other companies spent at least $50,000 each with a. c. f.

THIS REMARKABLE CONCENTRATION on the products of a single motor-coach manufacturer indicates the high esteem of the foremost operators for a. c. f. coaches and for the a. c. f. institution.

AMERICAN CAR AND FOUNDRY MOTORS COMPANY
30 Church Street, New York City

a.c.f. Hall-Scott

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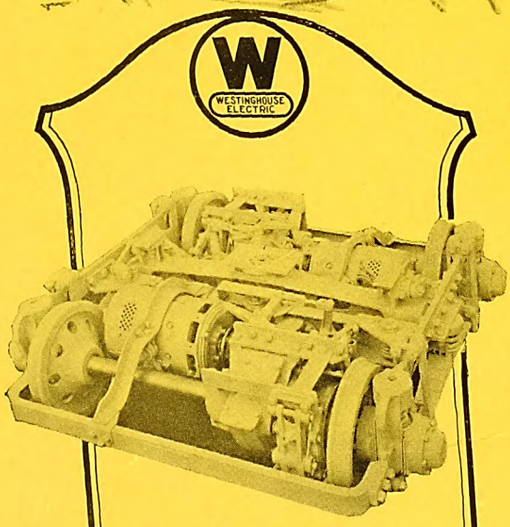

W-N Drive Installation

W-N Drive advantages

Lowest steps
Faster acceleration
Quiet operation
Motors spring borne
Gears run in oil
Greater clearance
Lighter weight
Lower maintenance

"Resolved *that we will vote for an increase in fares"*

WITH the new W-N drive car to offer, street railway companies can at last give the public benefits that will justify an increase in fares.

The public appreciates superior transportation and, what is more important, is willing to pay for it.

Patrons of the Brooklyn City R. R., when asked to write their opinions of the new W-N car, proved this beyond a doubt.

A few of the replies taken at random are an indication of what the W-N drive car will mean to many lines:

"Worthy of a ten-cent fare."

"I believe this car will attract many people who now use automobiles."

"Do we get all this for a five-cent fare?"

"Comfort of an auto-bus without its disadvantages."

Westinghouse Electric & Manufacturing Company
East Pittsburgh Pennsylvania
Sales Offices in All Principal Cities of the United States and Foreign Countries

MEMBER AMERICAN ELECTRIC RAILWAY ASSOCIATION

1928

Westinghouse

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Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review
Published by McGraw-Hill Publishing Company, Inc.
CHARLES GORDON, *Editor*

Volume 71 New York, Saturday, February 4, 1928 *Number 5*

The Engineer in the Rôle of Prophet

DEAN HERMAN SCHNEIDER of the College of Engineering and Commerce of the University of Cincinnati has prepared a prophesy which has been placed in the cornerstone of the new Union Central Life Insurance Building in Cincinnati, dedicated on Jan. 16. He would be the last to claim infallibility as a prophet, the most difficult of rôles. He knows, of course, that whatever wealth of progress science may bring out of its bag of tricks, man 100 years hence will not be different from us fundamentally, any more than we are different from mankind of 5,000 years ago in our passions, our vanities, our personal ambitions, and all other inherent human elements of which our spirits are compounded. But he is led to the belief that during the next hundred years science, religion, philosophy and even enlightened selfishness will walk together with greater surety toward the destiny for which mankind has been groping and blundering down the ages.

Just such prophesies are needed ever so often for the stimulation they contain. Ever since man became a reasoning animal fanciful, indeed, has been the first conception of the oddity that later has become reality. The whole gamut of history might be run to prove the point, but it is only necessary to mention Fulton, Edison, Bell, Marconi, Ford, Eads and Westinghouse to bring to mind the names of a myriad of other men whose first efforts were met with the smile of derision often from contemporaries of the pioneer. Many there are who always see things through a glass darkly. To them there is no remedy for the ills by which they are oppressed. They often have great fortitude, but very little foresight. And they have small patience with the advocates of change. They forget that progress should be imputed very largely to the builders of Castles in Spain, and that "Without Vision the People Perish."

Chicago's Anti-Parking Ordinance Benefits the Public

MUCH has been said in recent years about the evils and injustice of automobile parking in busy city streets. But though the facts are recognized, there has been practically no relief. The authorities in too many of our large cities have been afraid to offend someone, and congested business streets are still used by automobile owners for the free storage of their cars.

But in one city, at least, a change has come. Chicago is showing the way. Since Jan. 10 all parking has been prohibited in its central business area between 7 a.m. and 6:30 p.m. on Mondays to Fridays inclusive, and between 7 a.m. and 3 p.m. on Saturdays. The results to date are told by E. J. McIlraith in an article in this issue.

Most interest perhaps will be felt in the effect on the number of customers and the sales in the retail stores within the district. It is from the owners of such stores that most of the opposition to non-parking ordinances in the past has come. The experience in Chicago is that there has been no appreciable effect from the ordinance. This result might have been predicated from a previous analysis that only about 1½ per cent of the patrons of these stores came in automobiles. But it is satisfactory to have direct testimony on this point of effect on sales and patrons.

It is still more encouraging to learn of the gains in increased usefulness of the streets. Vehicles are moving with a saving in time of more than 20 per cent during the evening rush hours and of more than 30 per cent in the business day before 4:30 p.m. Street car schedules are much more regular. Pedestrians move more freely and with a greater sense of security. All these benefits have been obtained, of course, without limiting the use of the street to traffic in any way. Taxicabs, buses, private cars and commercial cars are permitted to operate as before. Passenger vehicles can stop to receive and discharge passengers as they always have done. It is simply that they cannot block the streets by using them for storage purposes.

The Chicago example should be followed by other cities.

Tacoma Pays the Penalty of Its Badgering Policy

RECEIVERSHIP for the Tacoma Railway & Power Company appears to be inevitable. This is a situation especially to be deplored, since mistaken political policies have had a good deal to do with forcing the company to the wall. For some years the conditions under which the company was required to operate were very bad, particularly during the term of office of the late Mayor Fawcett, who, in gloating over his anti-corporation attitude, inflicted the jitney upon the company. More recently, under Mayor Tennant the situation has been bettered, but the change appears to have come too late. As the present Mayor sees it, a prompt and orderly solution of the railway situation appears to be at hand. He has not been more specific than this, but his attitude toward the matter, and his attendance in New York at the meeting at which the affairs of the company were considered by its security holders would appear to augur well for the future.

The vociferous oppositionist appears, however, not to be stilled, since S. A. Perkins, newspaper owner, has just declared that if Tacoma had acquired its railways fifteen years ago "even paying five times the price they were worth, the city would be twice the size it is today." As he pretends to see it conflict at the City Hall with the railway would have been avoided.

Here, of course, is one of those half truths more deadly than the truth itself. In the first place, the statement about the probable growth of the city is clearly imaginative. Neither Mr. Perkins nor anybody else is in a position to say definitely what would have happened. But even granting that he is correct, could not Tacoma with

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results far more lasting to itself have achieved the same end under a program which would have made it possible for the company to carry on as it desired? As for the benefits of the avoidance of conflict, they would have been unmistakable. But they could have been obtained under private ownership.

Certainly, municipal ownership would not have helped here, not even at the City Hall. If there is any system that has been in the public eye more than the municipally owned one in Seattle, ELECTRIC RAILWAY JOURNAL does not know about it. It has been a case of continual conflict there. If wise, Tacoma will keep the situation in Seattle constantly in mind, and then proceed to effect a settlement of its railway problems in a business-like way that will take into account the drafting of an agreement for operation which will be sufficiently liberal in its terms to permit the present management to carry on as it is qualified to carry on. Hard hit as it is, the Tacoma road can be successfully rehabilitated, but only if the ideas on the part of the representatives of the public who deal with the company are so revised as to discard practically all of the motives that have actuated municipal administration there in recent years.

Adequate Fares Essential to Service Improvement

LIKE straws in the wind, there come these days from every quarter of the country, news dispatches regarding the upward adjustment of local transportation fares. Houston and Atlanta recently joined the rapidly growing list of cities in which a ten-cent base fare for a street car ride has been established. Dallas, Baltimore, and several other communities are making a move in the same direction.

Supplementing this trend toward equitable car fares, there is a similar undercurrent of thought in favor of putting bus fares on a basis which will permit this newest public transportation agency to stand on its own feet financially. To do that, buses must collect a rate of fare commensurate with the cost of giving supplementary transportation service, which in many instances is of a character distinctly different from that given with cars.

It is now generally agreed that the rate of fare in many initial bus applications was set too low. As a consequence the general idea was permitted to grow in the public mind that a bus ride and a street car ride can be given at approximately the same fare levels. There is no need here to review all of the causes for this situation. Suffice it to say that in some instances over-enthusiasm and an ambition on the part of some bus men to replace street cars, led to many initial installations at rates of fare that were too low to permit the development of bus service on an economically sound basis. In other instances buses replaced jitneys that consisted of nondescript small touring cars run by irresponsible operators and charging rates of fare below the cost of operation of a responsible, organized transportation service. The railway had the choice between operating buses at rates comparable with those charged by the jitneys, or of sitting back and permitting these "mosquito fleets," operating only on lines representing the cream of traffic, to sap the revenues of the street railways to the point where the entire transportation service was in danger of collapse. In still other instances, there existed the threat of competition by private bus operators. Self-preservation dictated the acceptance of almost any fare arrangement which would permit the street railway to make a move toward co-ordinating the rail and rubber tire transportation services.

Many cities are now awakening to the fact that the car riders of the community are paying for bus losses attributable to inadequate rates of fare for bus riders. This situation is receiving serious consideration in those cities that have had sufficient experience with the operation of buses on a large scale to get a fair approximation of the actual operating results. As a consequence the idea that bus operation should stand on its own feet financially seems to be spreading. It is obvious that this new form of public transportation cannot be developed to its logical place in the scheme of public services, unless it is permitted to become a financial asset and not a liability.

There are several outstanding examples of operations which, while originally started at street car rates, are gradually moving toward higher fare levels. As the number and length of bus lines is increased it is important that the 10-cent upper limit for city bus fares be broken before it becomes too firmly fixed in the public mind. At present there are lines in several cities giving a preferred class of service and charging a 25-cent fare. When the intermediate range of 15- and 20-cent rates is generally applied for all services which cannot be carried within the 10-cent limit, bus development will have burst one of its present restrictions and may be expected to move forward more rapidly than ever.

In the operation of both cars and buses, therefore, common sense economics and a clearer understanding of fundamentals are leading toward the establishment of fares that promise widened opportunity for really merchandising public transportation service. As the rates of fare are brought to levels that offer fair opportunity for reasonable profit railway managements may be expected to attack with increased zest and determination the many problems incident to providing really satisfactory public transportation service.

What Makes the Street Car Slow?

WITH the railroad station about a mile away, a business man had fifteen minutes to catch a train. He wavered between taking a taxicab and taking the street car. From past experience he knew that the taxi usually made the trip in five minutes and the street car in seven. He felt that he had sufficient time, so he decided to take the car and save the difference in cost.

But he hadn't allowed for the attitude of the management of that particular street railway. The company was more interested in getting his nickel than in giving him his money's worth for it. He boarded the car and paid his fare. Then he noticed that the conductor was having trouble with the fare box. In front of one of the company's depots the car stopped and an inspector got on. Conductor and inspector examined the fare box and discussed the situation. The car did not move. At the conclusion of an apparently complicated bookkeeping operation, the inspector removed the defective box and disappeared into the building. Still the car did not move. The passengers fretted and fumed. Presently the inspector reappeared with another fare box, which he installed in its appointed place on the platform. Another complicated bookkeeping operation ensued. Finally the car moved on.

Seven minutes had been lost by this procedure. The

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car was late now. At every corner more passengers boarded the car, making it later than ever. Instead of the usual seven minutes to reach the railroad station, the trip took seventeen. The hurried business man reached the train shed just in time to see the attendant taking down the sign which had marked the train he missed. He had lost his train and the street railway had lost a patron forever.

Reasons there are, of course, for practices of this kind. The passenger's nickel is the life-blood of the railway. Revenue must be protected and all that. But in the last analysis the best way to protect the revenue is to render service that satisfies the customer.

New York Company No Longer the Silent Victim

QUITE within its rights is the Interborough Rapid Transit Company in its appeal to the Transit Commission for a 7-cent fare and in its statement indicating its purpose to carry the matter to the courts. This is not the first time that the company has sought similar relief, although on the previous occasions it took no steps other than its appeal to the commission. They were lost first by changes in administration and second by changes in which the Legislature played battledore and shuttlecock with fare control provisions.

The flood of comment that has followed the company's announcement made it appear that the change in rate might be made over night. Nothing, of course, is farther from the fact. Despite this, however, journalistic advocates without number recommend further temporizing. Even the New York *Times* says that both sides have far more to gain through patient dealing with each other than through blasts and counter blasts, lawsuits and counter law suits. This would be good advice if the recommendation had not already been nullified by the course of the city under the Hylan administration, by the inaction of the present city administration under Mayor Walker and by the still more recent belligerent attitude of the Transit Commission under the procedure of its counsel whose every move seems to be a threat.

The record of fare increases on electric railways elsewhere throughout the country testifies to the widespread recognition of changed economic conditions. Even the public directors of the company who voted in the negative on the issue are convinced that satisfactory service is impossible without an increase in fare. The position of the company is that it does not desire to charge more or less than the rate of fare which will conservatively enable it to pay proper wages and meet present-day operating costs, together with an adequate return upon the property devoted to the public service. This is essential that its credit may be restored and that it may procure new capital sufficient for improvements. In short, it seeks neither more nor less than a reasonable fare, based on elements recognized by the courts and subject to revision downward or upward as the costs and conditions justify. In this respect the Interborough is modesty itself when contrasted with most of its critics.

Summarized, the plea made by the company to the Transit Commission is that the rate regulatory provisions of the law entered by implication into the terms of the leases, agreements and authorizations covering the subway and elevated rapid transit railroads; that they formed part of the obligations of those instruments, and that they were notice to the parties thereto that those instruments were coupled with a provision that the Legislature, in the exercise of its powers, either itself or acting through another might regulate the rates thus fixed, and particularly, with the provision of the statute that a common carrier, such as the Interborough, was allowed by law to put into operation a new schedule of just and reasonable rates and charges to be made for service, upon notice, filing and publication, as provided by law.

In its legal phases the matter is not so easy to follow. The company has equipped and is operating under contract calling for a 5-cent fare certain lines that the city built. In the event that the case goes to the courts from the commission the railway will put in a plea of confiscation. It is safe to say that most of the critics of the company would long since have resorted to the course upon which the company now enters had they been confronted with a set of conditions similar to those with which the Interborough has had to contend. In matters of this kind it makes a great difference whether one is a spectator of them or one of the victims.

Progress of Simplified Practice Continues

GROWTH of simplified practice as a means of eliminating waste in industry has continued during the year. This is indicated by the completion of eighteen new recommendations, thus bringing the total number of projects to 80, according to a review of the past year's activities of the Commercial Standards Group of the United States Bureau of Standards by Ray M. Hudson, assistant director in charge.

This paper has from the outset been in favor of the simplified practice movement, since it has been shown that it effects economies and facilitates the work of maintenance. That simplification yields benefits sufficient to attract manufacturers, distributors and consumers alike is indicated by the high degree of adherence shown by reviews of fifteen of the simplified practice recommendations already promulgated. According to the report acceptors representing an average of nearly 83 per cent of the total volume of the industries affected are following the simplified practice schedules. Associations indorsing the recommendations grew from 686 to 898 during the year while individual concerns went up from 2,775 to 6,676. This means that an increasing number of industrial purchasers are specifying simplified lines when buying because they find that such items usually are more readily obtained, their quality is better, and prices are lower.

Mr. Hudson cites many specific instances where simplified practice has made savings. The money value ranges from small sums up to many thousands of dollars. Not the least of the savings reported are due to the smaller stocks that need be kept on hand and the greater ease of handling the stocks.

In the transportation industry, the simplification program still can be carried much further than it has been so far. Many properties have found that the number of stock parts can be reduced greatly without detriment to the finished work and with all the advantages cited above. The program should continue to receive attention of those involved and every effort should be made to carry it as far as practicable. The savings to each company are so great that they cannot be overlooked by anyone who has a regard for keeping costs down.

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Chicago Prohibits Parking

in Its Central Area

Before adoption of present ordinance a few individuals hampered free movement of many thousands. Under new law, vehicle speeds have gained from 15 to 30 per cent and usefulness of the streets has been greatly increased

By E. J. McIlraith

Staff Engineer Chicago Surface Lines

PARKING in Chicago's central business district is banned by an ordinance that became effective Jan. 10. That it will be continued seems certain. Various measures will be applied to determine the success of the change, and some variety of opinion will result. People differ widely in opinion on the value of each of our best assets. There will even be a variety of opinion about the beauties and gladness of heaven. Opinions of individuals are not always well established by adequate and relevant facts.

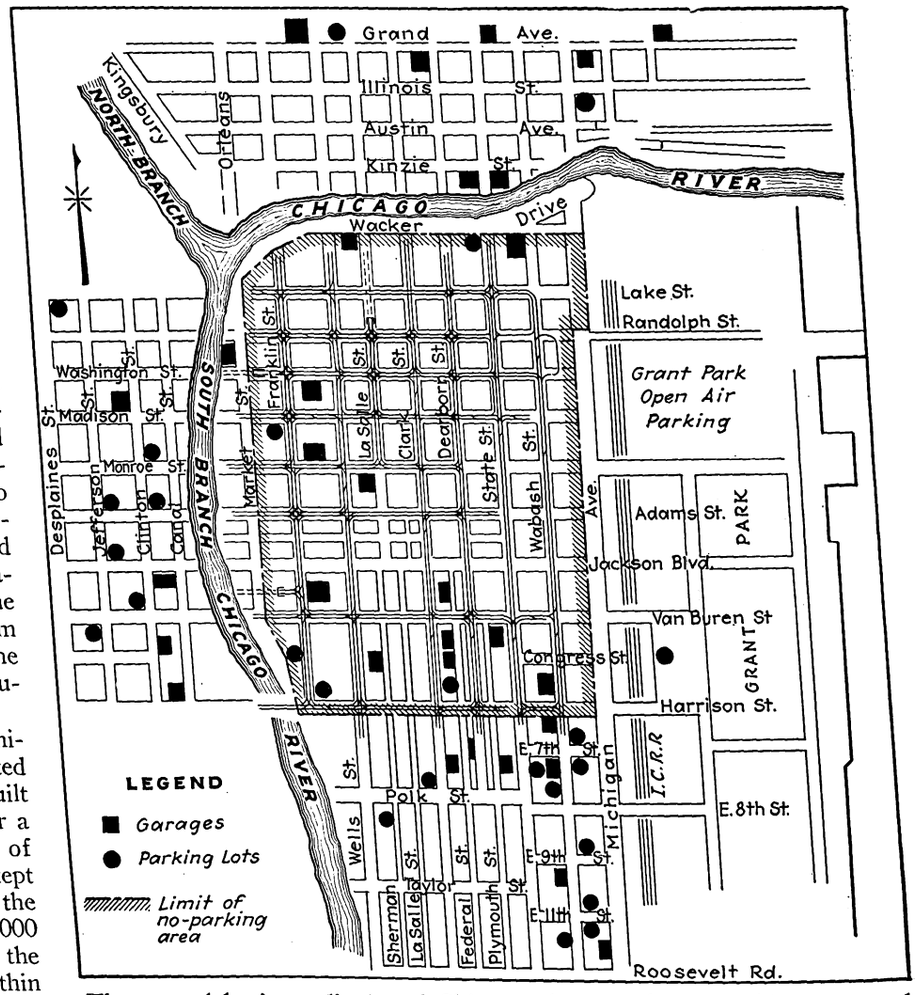
The primary purpose of the regulation is to permit the growth and development of Chicago. It is to encourage the concentration in Chicago of the administrative, financial, advisory and engineering organizations and of great mercantile and sales corporations that are finding this city the most desirable strategic location from which to direct the business of the great area which is coming to be tributary to Chicago.

The growing central district in Chicago is fast changing to a concentrated group of huge office buildings built about streets that were laid out for a frontier town. The usefulness of those streets constantly must be kept adequate to serve conveniently the needs of the great army of 900,000 people who now daily move into the district and travel about within that area.

Unless it is apparent that regulations can be made from time to time that relieve materially the threatened congestion and prevent the occurrence of confusion on the city streets, confidence cannot exist in the future of this area that soon promises to be more valuable than that of any similar area in any city. Without such confidence the rapid surge forward of the last five years will be checked and finally stopped.

The present enthusiasm to locate in Chicago, and the urge for magnificent new buildings closely arranged, convenient to each other, are dictated by sound economic reasoning. Great building activity will continue if the application of modern principles of city development can be expected from Chicago's city government so as to keep pace with such concentration of building activity.

On Manhattan Island two major business centers exist,



The central business district of Chicago, showing the no-parking area and the location of garages and parking spaces

Under the present ordinance parking is prohibited in the area inside of the shaded line between 7 a.m. and 6:30 p.m. from Monday to Friday inclusive and from 7 a.m. to 3 p.m. on Saturdays.

Wacker Drive, with its two levels, adds parking space for 1,700 cars. Parking space on streets could serve only 1,157 cars at one time.

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because lack of street space and lack of adequate transportation threatened to throttle business in the lower end of the island. The difficulties and tendencies on Manhattan are not at all present in Chicago, where the land values are becoming higher than in New York, and where the original central area of the city is still the most valuable. There is ample opportunity for the development of a sufficient number of streets and adequate lines of convenient transportation to serve the great central area of Chicago for the next fifty years.

TABLE I—COMPARISON OF PEDESTRIAN COUNTS IN DISTRICT, MADE BEFORE AND AFTER PLAN WAS EFFECTIVE

STATE STREET, BETWEEN MADISON AND MONROE, 11:30 A.M. TO 6 P.M.

	West Side of Street			East Side of Street			Total Both Sides
	N. B.	S. B.	Total	N. B.	S. B.	Total	
Nov. 25, 1925	30,000	30,375	60,375	18,856	16,400	35,256	95,631
Jan. 23, 1928	35,115	37,764	72,879	27,602	23,546	51,148	124,027
Per cent increase	17.0	24.2	20.8	46.4	43.6	45.1	29.7

CLARK STREET, BETWEEN MADISON AND WASHINGTON, 12:45 P.M. TO 6 P.M.

	West Side of Street			East Side of Street			Total Both Sides
	N. B.	S. B.	Total	N. B.	S. B.	Total	
Dec. 15, 1925	7,475	7,150	14,625	9,175	9,356	18,531	33,156
Jan. 23, 1928	11,404	10,872	22,276	10,176	8,597	18,773	14,049
Per cent increase	52.6	52.1	52.3	11.0	9.2*	1.3	23.8

* Indicates Southbound decrease.

Three major steps in recent years have steadily produced increased street capacity and improved convenience for all the people using the streets. In 1924 rerouting of street cars and abolition of left turns of vehicles over a large area made a remarkable street improvement. In 1926 an entirely new, and as yet the best, system of signal control again added new capacity and increased the convenience and safety of the streets. Now in 1928 another great step has been made, and again a new confidence has been established that there are always new ways to prevent confusion and congestion.

The next major improvements that can be made are already clear and will be effective in due time before the results from the present expedients have been absorbed by the growth in street traffic. Chicago has been leading all large cities in avoiding excessive congestion in its principal center.

Exact figures to express the degree of improvement as a result of the no-parking regulation can be obtained only as a result of compilations of data on many factors. Such data as are now available measure decided improvements. Vehicles are moving with a saving of time averaging more than 20 per cent in the rush period of the evening and more than 30 per cent in the business day before 4:30 in the afternoon. Street cars are averaging speeds that save 15 per cent of their passengers' time. Better than the time saving is the improved regularity with which the street cars move through the streets. This means more uniform spacing for the cars along the entire length of each line. All parts of the city served by lines entering the loop area are bound to get better service.

Pedestrians are moving more freely and with a greater sense of safety. There is better vision for drivers and pedestrians, less confusion and crowding, fewer conflicts and dangers.

Merchandise vehicles can move with freedom and can easily reach the curb for loading and unloading. Taxicabs no longer need to collect passengers or stop to unload and receive fares on crosswalks or in a line of moving traffic. There is freedom on practically all streets at all times. Where points of difficulty still remain it is only because some necessary regulation of movements has not yet been made or further signal adjustment is needed to meet the changed traffic flow.

The effect on the volume of shopping, banking and restaurant business is, of course, important. It is early to have reliable figures. It may have been unfortunate that this regulation became effective at one of the dull periods of the winter season. It is a quieter year in business than a year ago, and the second week of January is a period of lull after the readjustment period that begins after Christmas when big reduced price sales are advertised that attract many shoppers.

The most convincing data to date are comparisons of pedestrian counts. All counts were made on days having seasonable weather, but those taken previously were made during very active business periods. Even though January is normally quieter than November and December the number of pedestrians counted on the streets, after this ordinance became effective, was tremendously greater than at a period about two years previously when business was considered excellent. The present January depression may have decreased the purchasing power of the individuals, but it is apparent that a greater number of individuals are available on the streets as potential customers.

Interesting figures are those of store-door counts which have been taken at those stores whose representatives were loudest in condemnation of the plan. These checks show conclusively that there is no difference in the number of customers beyond that to be expected as a variation from day to day.

TABLE II—ONE-DAY COUNTS OF CUSTOMERS IN REPRESENTATIVE SHOPS IN DISTRICT, MADE BEFORE AND AFTER PLAN WAS EFFECTIVE

Establishment	Before	After
Furs and apparel	371	357
Book store	2,008	2,018
Restaurant and bake shop	3,307	3,218

There can be, however, no appreciable change at once due to this new regulation. Over a period the effect must be to the advantage of all.

SMALL MINORITY DELAYED MOVEMENT OF MANY

Parking has been a decided and major factor in creating street congestion. Most of the streets are either 48 ft. wide or 38 ft. wide between curbs. With 8 ft. used on either side for parking on 48-ft. streets only two-thirds of the original width was left for movement while on the narrower streets only one lane was available in each direction. Since the curb lane was occupied by parked vehicles much loading and unloading of merchandise and passengers was carried on from vehicles standing alongside the parked vehicles. Further, the maneuvering of vehicles into and out of cramped parking spaces delayed all movements along the street.

Out of 892,000 people entering the Loop per day only 27,000 or 3 per cent were using parking space at the curb, whether in prohibited areas, or at illegal time, or correctly, as noted by actual counts taken between 10 a.m. and 6 p.m.

Only 1,157 vehicles can park legally at any one time in the Loop District and since 1922 parking has been prohibited by ordinance between 7 and 10 a.m. and between 4 and 6 p.m. on all streets having car lines, although the ordinance is not well enforced. Parking has

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On Monroe Street before and after the parking ban

The view at the left was taken looking west on Monroe at Dearborn on Jan. 6, 1928, at 11:37 a.m. The one at the right was taken from the same location on Jan. 10 at 11:47 a.m.

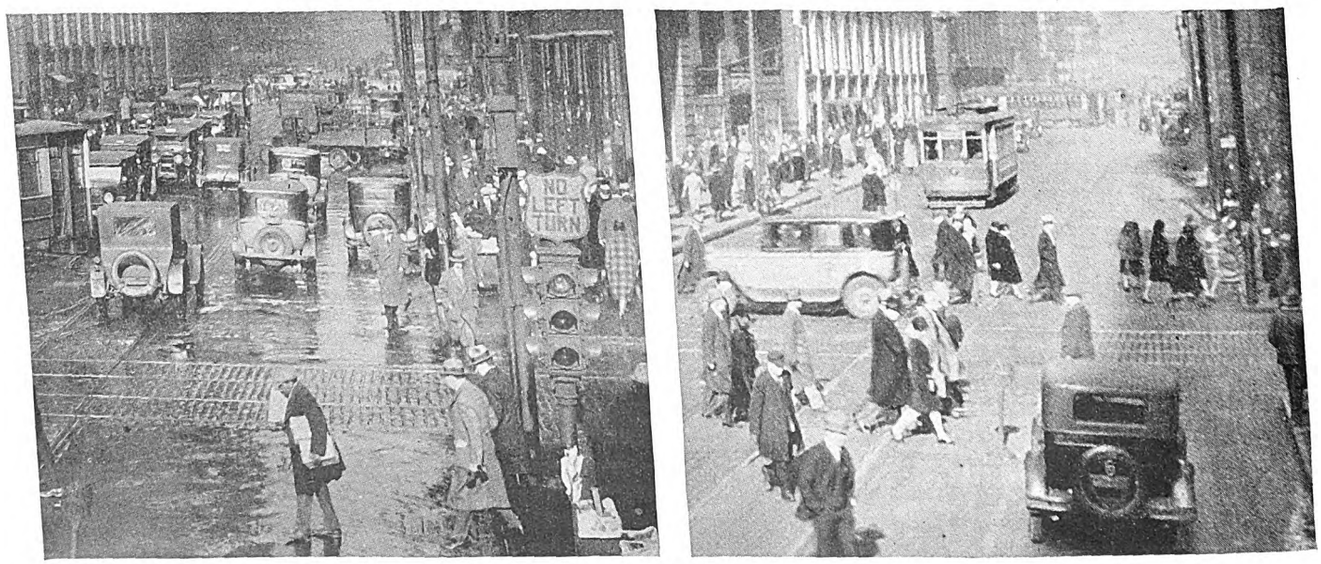
also been prohibited on Jackson and on the west side of Michigan Avenue. The maximum number of vehicles that legally could use the available space in one day, under the limitation of one-half hour, would be 18,222. Counts show that only 78 per cent of the vehicles parking have been private automobiles, so the number of these which could have parked under the old regulations would have been 14,213.

Only 17 per cent of all the automobiles driven into the district could be given parking space at the curb, the other 83 per cent of drivers found ways of using automobiles without standing on the public streets. Does it not seem reasonable that the 17 per cent should be required to do likewise when their vehicles are so seriously in the way and create congestion for the other 97 per cent of street users?

On State Street between 2 p.m. and 3 p.m. of a typical day 22,676 people were counted walking on both sides of the street between Monroe and Madison. For the same hour in August a count showed that with all the parking space used in the block and with more than 90 per cent of the vehicles private automobiles only 122 people were served by parking. In other words out of the 22,676 people on the sidewalk only 122 came from parked cars that occupied a space 8 ft. wide along each curb.

On Clark Street between Washington and Madison in the same hour 8,259 people were walking the sidewalks while only 94 people were served by the parking space, although it was all in use. Can such use be justified in a busy district?

Not all blocks had so much parking space available as the two above mentioned under the restrictions in force before Jan. 10. Out of a total curb length in the loop of 57,958 ft. only 17,352 ft. was left for parking under the ordinances previously in effect. More was being used and the large number of cab stands were equivalent to parking in using curb space. But many business houses had obtained "no parking" zones in front of their buildings—the alderman for the district has had 144 ordinances passed creating such restrictions. Yet, in spite of this constant reduction in available parking space due to individual action of the business men some now feel that clearing the streets of the rest of the parking is a serious hurt to business. It is fear rather than reasoning that prompts the notion.



Views on Dearborn Street in the heart of Chicago's Loop district

The views are looking north on Dearborn Street at Adams. The one at the left was taken on Jan. 6, 1928, at 12 noon. The one at the right was taken on Jan. 10 at 11:40 a.m.

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The abuse of the parking privilege was always great, since it was impossible to keep a record on the time vehicles arrived and left. Table III shows the results of an unofficial count of vehicles in the central section, where curb parking was limited to a half-hour period.

TABLE III—TIME THAT VEHICLES USED PARKING SPACE IN CONGESTED DISTRICT BETWEEN 10 A.M. AND 6 P.M.

(The total number checked was 19,447. Of this number 78 per cent were private automobiles.)

Time Parked	Number of Cars
Less than 40 minutes	16,066
Between 40 minutes and 60 minutes	1,364
Between 1 hour and 2 hours	1,208
Between 2 hours and 3 hours	348
Between 3 hours and 4 hours	171
Between 4 hours and 5 hours	116
Between 5 hours and 6 hours	58
Between 6 hours and 7 hours	56
Between 7 hours and 8 hours	60
Total number observed	19,447

Of those automobiles which parked more than 40 minutes, 86 per cent were private cars. In other words, the selfish user was saving himself 50 cents or less for garage space, was leaving his car exposed to the weather and to the hazard of bumps and scratches, and was causing the other citizens a wastage equal to many dollars, due to his misuse of the most valuable space in the city.

Interviews with 96,082 people showed the proportions using curb parking space were as shown in Table IV.

TABLE IV—SHOWING NUMBER OF PATRONS INTERVIEWED AND NUMBER ARRIVING IN PARKED AUTOMOBILES

Establishments	Total Patrons Interviewed	Those Arriving by Automobiles Parked at Curb Number	Per Cent of Total
Department stores	68,621	1,013	1.47
Office building	9,432	167	1.77
Banks	8,421	144	1.71
Musical instrument stores	2,649	61	2.29
Furniture stores	2,378	45	1.88
Shoe stores	1,064	32	3.02
Restaurants	2,405	41	1.69
Book stores	112	2	1.74
Grand total	96,082	1,505	1.57

As will be seen, only 1.57 per cent arrived in automobiles that parked at the curb. Can any merchant measure the effect of these few when his daily variation of business is much greater?

There is garage space available for all who wish to park within or immediately adjacent to the Loop. Even if each person who used curb space were to put his car in a garage in this immediate vicinity there would be a considerable amount of vacant space left, and more garages are being built.

The streets in this area seem to have lost much vehicular traffic. They look rather like a former holiday. Yet, counts of the vehicles now operating in the mid-winter period as compared to summer conditions, do not indicate any material change in the total number. There are almost as many private automobiles as ever in spite of the decreased use that is made of automobiles in cold weather. Many more can be operated because of the increased street freedom that has been created.

TABLE V—CHECK OF MOVING VEHICLES ON FOUR REPRESENTATIVE STREETS OF CENTRAL DISTRICT, MADE BEFORE AND AFTER PLAN WAS EFFECTIVE

	Street Cars	Private Autos	Service Autos	Taxi-cabs	Wagons	Tota
July and August, 1926	*2,399	13,882	3,523	9,814	858	28,077
Jan. 30-31, 1928	.....	13,150	4,007	10,930	764	28,851
Per cent increase	.....	—5.3	+13.7	+11.4	—10.9	+2.8

* One of these streets has no car tracks.

Automobile owners have not been hurt, but automobile usefulness has been improved and the comfort of driving much increased. Street capacity has been much increased. Costs of and delays in the delivery of merchandise have been greatly cut. Street car passengers can get to and from safety zones with much greater comfort and can get better car service at better speed.

Pedestrians have much better visibility, more room to move and better safety.

Business cannot be hurt noticeably, even if the most pessimistic view were taken. Indeed, in all cases it must soon show real improvement because the central district is a better place for all who come there.

The prestige and promise of future greatness of the entire city of Chicago is enormously promoted by this step toward preserving freedom and convenience of communication in the central business district. This deserved reputation for constructive adjustment to meet growing needs will create real confidence that this city can continue to grow until it is the greatest in the country, and the most convenient one in which to do business.

Index Numbers of Electric Railway Construction Costs

The relative costs of track construction by years is analyzed. Greater productivity per hour of track labor found

DEVELOPMENT of index numbers of public utility construction costs, with particular reference to electric railway track costs, is discussed in an article which appears in the November issue of the *Journal of Land and Public Utility Economics*. It is by Paul Jerome Raver, valuation engineer. He points out that the street railway industry lends itself particularly well to the making of such index numbers, because the construction side of the industry has been fairly well stabilized for a number of years. But he warns that too much should not be expected of any index number.

TABLE I—RELATIVE PRICES OF TRACK MATERIALS

Contract Prices, Delivered to Yard—1913=100 Per Cent

Classification	1913	1916	1919	1922	1925	1926
Rail—high tee and girder	100.0	121.8†	169.5†	154.4	147.9	147.9
Rail—low tee	100.0	107.7	157.3	132.6	141.5	140.4
Fish plates	100.0	114.5	270.0	187.8	258.9	258.9
Tie rods	100.0	137.1	200.0	130.3	144.2	148.8
Tie plates	100.0	114.6	133.6	79.2	105.9	93.7
Special rail fastenings	100.0	182.5	259.3	187.5	205.3	205.3
Hook-head spikes	100.0	146.9	226.3	156.2	181.2	181.2
Ties	100.0	111.8	195.1†	186.3	209.9	216.6
Torpedo sand	100.0	85.5	113.6	146.9	136.4	136.4
Crushed stone	100.0	92.4	130.4	244.6	188.0	179.3
Portland cement	100.0	131.0	190.0	194.0	205.0	195.0
Granite paving blocks	100.0	102.9	120.1	159.3	164.2	164.2
Vitrified brick, paving	100.0	124.7†	171.1†	174.9	147.3	143.5
Creosoted wood blocks	100.0	107.3	169.3	152.0	165.3	168.3
Hauling excavated material*	100.0	129.2	230.8	430.8	476.9	476.9

* Yearly contract. † None purchased; market price used.

In the present study approximately 95 per cent of the total revenue track on streets was considered a fair sample, and the various types of track construction were taken in approximately the same proportion. Of the total sample, 93 per cent is paved and concreted construction. The principal paving material is granite block, with creosoted block, brick and concrete making up the balance in varying proportions.

Overhead charges were excluded because they are usually applied as a percentage of the total valuation after this had been determined. Some minor items were

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also excluded as affecting only the fifth significant figure of the index number. These small items also, it is believed, will produce errors which are compensating rather than cumulative. The hauling of excavated material was included under material rather than under labor, as it is usually handled by contract. Some other items were excluded, because their installation has been confined to a relatively short and recent period. Steel ties are an example.

The relative prices from 1913 to 1926 inclusive of

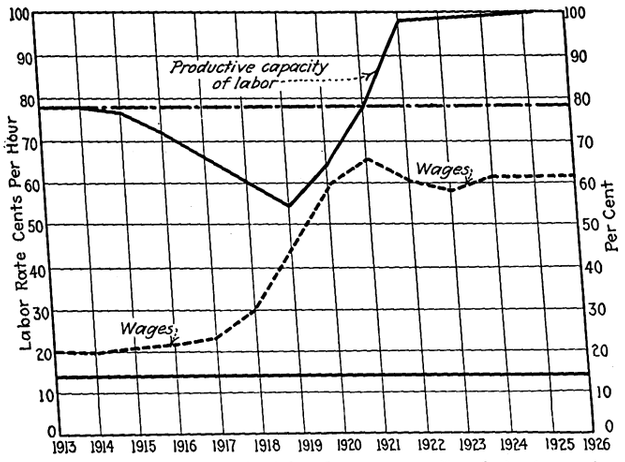

Chart 1—Variation in labor-hours per mile of single track, 1913-1926 (1926 = 100 per cent)

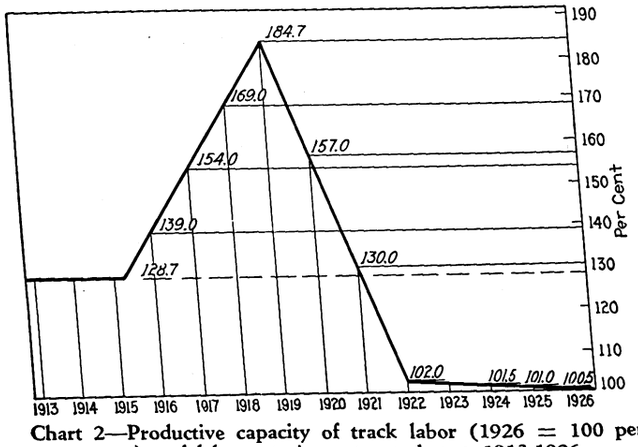

Chart 2—Productive capacity of track labor (1926 = 100 per cent) and labor rate in cents per hours, 1913-1926

the fifteen principal items used in track construction are given in Mr. Raver's article. A portion of the table is reproduced in Table I. The value of each item in the total track structure and in the composite index number of track material for the same years, is also published. These figures are reproduced in Table II. The author

TABLE III—TRACK LABOR, 1913-1926—AGGREGATE LABOR COST OF TOTAL TRACK SAMPLE

Based on: (1) Aggregate labor-hours in 1926 taken as constant for each year (37,584,601).
(2) Productive capacity of labor with 1926 taken as 100 per cent (column 6).

	1	2	3	4	5	6	7
Year	Average Rate Per Hour, for Construction Crews, Including, Foremen, Watchmen, Pavers and Laborers*	Index No. of Wages (1913= 100)	Cost of Labor (col. 1 × 37,584,601 (millions)	Productivity of Labor† 1926= 100	Total No. Hrs. Based on 100% Efficiency in 1926. Chart I	Cost of Labor (col. 1 × col. 5) (millions)	Index No. of Col. 6
1913	$0.20	100	$7.5169	77.682	48,382,657	$9.6765	100
1914	0.19½	97.5	7.3290	77.682	48,382,657	9.4346	97.5
1915	0.20¼	103.3	7.7676	76.924	48,859,981	10.0979	104.4
1916	0.21	105.0	7.8928	71.943	52,242,595	10.9709	114.3
1917	0.22½	112.5	8.4565	64.936	57,880,286	13.0231	134.6
1918	0.29¾	148.3	11.1502	59.172	63,517,976	18.8439	194.7
1919	0.44½	217.5	16.3493	54.136	69,426,275	30.2004	312.1
1920	0.59	295.0	22.1749	63.695	59,007,824	34.8146	359.8
1921	0.65¾	327.5	24.6179	78.125	48,108,289	31.5109	325.6
1922	0.60¾	302.5	22.7387	98.040	38,336,293	23.1935	239.7
1923	0.57½	287.5	21.6111	98.523	38,148,370	21.9353	226.7
1924	0.61	305.0	22.9266	99.010	37,960,447	23.1559	239.3
1925	0.61	305.0	22.9266	99.503	37,772,525	23.0412	238.1
1926	0.61	305.0	22.9266	100.0	37,584,601	22.9266	236.9

* Chart I. † Chart II.

says the weights given by him to the different factors apply during the period mentioned and will continue to do so for many years to come, unless companies undertake an extensive reconstruction or extension program.

In his compilation contract prices were used, except in a few cases where they were not available. In these instances the relative market prices were used to interpolate the contract prices. Savings from cash discounts were not considered. The cost was that laid down in the company's store yard. The cost of hauling the material to the job was included in the labor hours analysis.

Factor of Labor Productivity

To determine the variation in productivity of labor, a heavy type of paved track construction, typical for the group of companies studied, was analyzed. The variation of the number of labor hours required from 1913 to 1926 to build 1 mile of single track of this type of construction, was charted on a percentage basis and is given in chart 1. The year 1926 was taken as 100 per cent because in it the productivity of track labor was found to be greater than in any other year in the series. Though based on one type of track construction only, the percentage variations shown on Chart 1 have been assumed to apply to each of the different types considered in determining the total number of labor hours. From these figures the productive capacity of labor, shown on Chart 2, was obtained, the chart also showing the average wage rate.

From these figures the aggregate labor cost of the total track sample is obtained, as shown in Table III. As will be seen in this table wages are approximately 205 per cent higher than they were in 1913, but labor costs only 138 per cent higher.

TABLE II—VALUE OF EACH ITEM OF MATERIAL IN THE TOTAL TRACK STRUCTURE AND THE COMPOSITE INDEX NUMBER OF TRACK MATERIALS

Classification	1913	1914	1915	1916	1917	1918	1919	1920	1921	1922	1923	1924	1925	1926
Rail—high tee and girder	6.423	6.423	6.423	7.823	9.690	12.730	10.886	10.886	10.064	9.917	9.166	9.502	9.502	9.502
Rail—low tee	0.014	0.015	0.015	0.015	0.017	0.029	0.022	0.022	0.020	0.019	0.019	0.019	0.020	0.020
Fish plates	0.343	0.343	0.343	0.393	0.440	0.683	0.927	0.927	0.814	0.645	0.862	0.889	0.889	0.889
Tie rods	0.236	0.179	0.179	0.324	0.430	0.430	0.473	0.502	0.351	0.308	0.393	0.401	0.341	0.352
Tie plates	0.950	0.950	0.970	1.089	1.188	1.247	1.270	1.498	1.138	0.752	1.088	1.039	1.007	0.891
Screw spikes and clips	0.238	0.207	0.177	0.434	0.583	0.583	0.617	0.698	0.518	0.446	0.471	0.471	0.488	0.488
Hook head spikes	0.006	0.006	0.006	0.009	0.013	0.016	0.014	0.019	0.013	0.010	0.012	0.012	0.011	0.011
Ties	1.275	1.248	1.188	1.425	1.565	1.565	2.489	3.378	1.998	2.375	2.824	2.521	2.677	2.762
Torpedo sand	1.030	1.021	1.030	0.880	0.983	1.143	1.171	1.723	2.023	1.513	1.612	1.405	1.405	1.405
Crushed stone	1.751	1.998	1.998	1.618	1.998	2.531	2.284	4.187	4.473	4.282	3.806	3.711	3.293	3.140
Portland cement	1.911	1.911	1.949	2.503	2.790	3.268	3.631	3.822	2.886	3.698	4.032	4.013	3.918	3.726
Granite paving blocks	7.099	6.960	6.960	7.308	7.830	7.830	8.526	9.918	11.310	11.310	11.554	11.658	11.658	11.658
Vitrified brick, paving	0.210	0.210	0.210	0.262	0.262	0.308	0.360	0.400	0.384	0.368	0.360	0.348	0.310	0.302
Creosoted wood blocks	0.183	0.183	0.183	0.196	0.211	0.273	0.310	0.432	0.303	0.278	0.315	0.303	0.303	0.308
Hauling excavated material	1.208	1.357	1.301	1.561	1.765	2.788	2.788	5.575	4.460	5.203	5.203	5.203	5.761	5.761
Total material	22.877	23.011	22.932	25.840	29.765	35.424	35.768	43.987	40.755	41.124	41.717	41.495	41.583	41.215
Index Number of material	100.0	100.6	100.2	112.9	130.1	154.8	156.3	192.3	178.1	179.8	182.7	181.4	182.1	180.5

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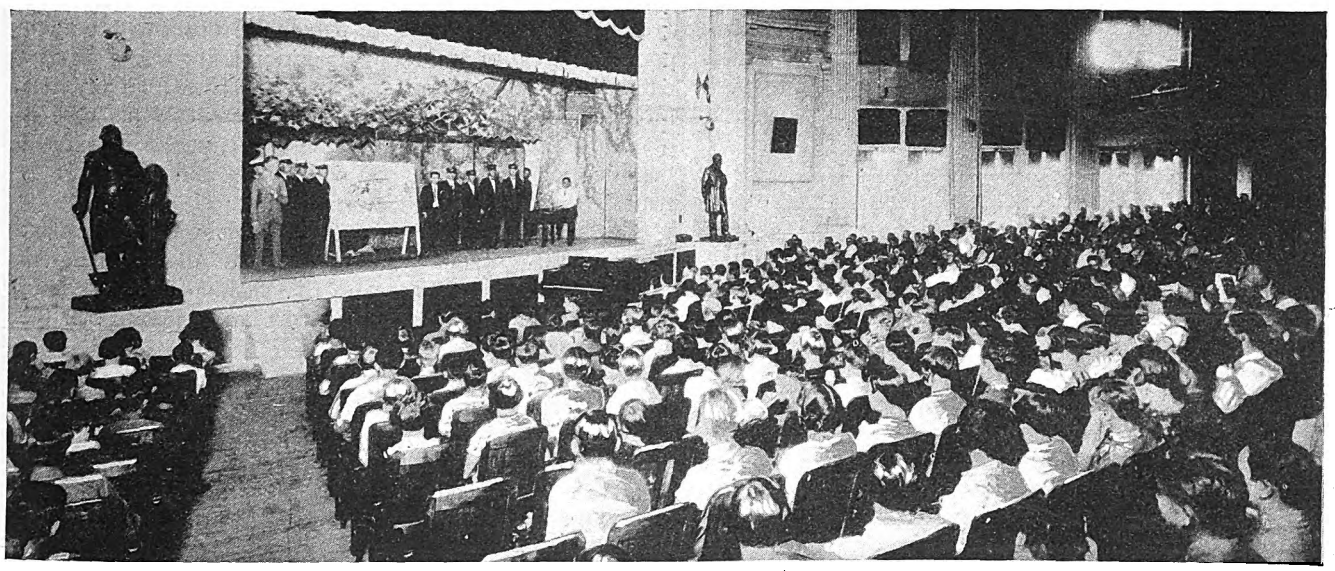
El Paso Wins Prize for

Precautions Against Accidents

This medium-sized electric railway has developed many excellent practices which brought for it the Brady award in its class



A safety chalk talk to new pupils of the El Paso High Scho ol. The captain of the police traffic squad did the talking and a representative of the El Paso Electric Company did the chalking

SAFETY practices of the El Paso Electric Company, which received the Brady 1927 prize for safety offered to medium-sized electric railway companies, show what an electric railway operating between 1,000,000 and 5,000,000 car-miles a year can do. The company furnishes co-ordinated electric railway and bus transportation service to a combined population of 137,000 in El Paso, Tex., the government cavalry post at Fort Bliss, and Juarez, Mexico. It owns 43.03 miles of equivalent single track and does an annual business of approximately $850,000. Its rolling stock consists of 76 passenger cars, six work cars and four buses.

In 1926 there were 452 accidents, as compared with 546 in 1925, which is an improvement of approximately 17 per cent. Compared with 1921, the accident figures for 1926 indicated an improvement of 74.4 per cent. In bringing about this reduction, the company has co-operated with the police traffic department, the public schools, civic, engineering and social clubs, the Chamber of Commerce, parents and various other agencies. One of these was the Forum public safety committee, which succeeded in staging a number of safety shows and demonstrations during the year.

Besides all the more commonly known methods, a number of original ideas have been put into force. Outstanding among these are the "honor roll," "safety star system," "bogey breakfasts" and "seven zero days" contest.

One of the earliest organizations in the city with which cordial co-operation in safety measures were established was the police force. The traffic officers and other members of this organization hold regular meetings twice monthly. Frequently, now, the operating officials of the El Paso Electric Company are invited to meet with them and discuss traffic problems and accident prevention. In the arrangement of car stops and parking zones for automobiles the advice of the company is always sought by the department, and often it is possible to make valuable suggestions. The company supplies the department with accident data.

Co-operation with the daily papers is intimate. The El Paso *Herald,* for instance, during 1926 published short biographies of each of the company's gold star safety men with a portrait. One of these sketches appeared every day during the year until the list of gold star men was exhausted. The company supplies the daily papers in El Paso with any information about operation which it is thought will be of interest to the public. Thus a great deal of safety news appears in type.

The company has also co-operated with various civic clubs, has furnished them many motion picture films dealing with electrical subjects, and on a number of occasions representatives of the company have been invited to address the meetings of these clubs.

Close co-operation has been effected with the public schools. Films have been loaned to them, safety calendars have been supplied and during the year students in all high schools in Texas were called upon to submit safety art posters in a state-wide contest. Upon request, the company furnished to one of the art teachers, for

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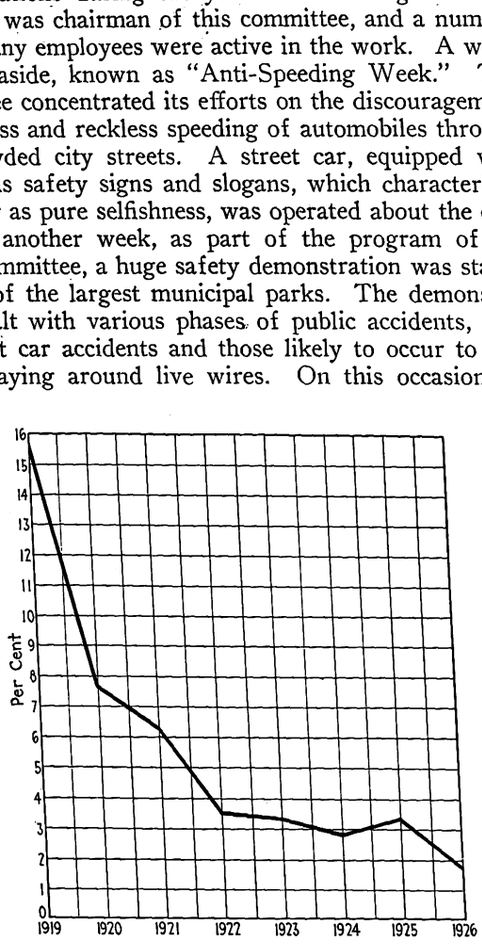
help in this contest, a set of safety slogans which had been run on the dashboards of the street cars.

As already explained, the public safety committee of the Forum planned and executed many novel safety demonstrations during the year. The manager of the company was chairman of this committee, and a number of company employees were active in the work. A week was set aside, known as "Anti-Speeding Week." The committee concentrated its efforts on the discouragement of careless and reckless speeding of automobiles through the crowded city streets. A street car, equipped with numerous safety signs and slogans, which characterized speeding as pure selfishness, was operated about the city. During another week, as part of the program of the same committee, a huge safety demonstration was staged in one of the largest municipal parks. The demonstration dealt with various phases of public accidents, such as street car accidents and those likely to occur to persons playing around live wires. On this occasion the



The percentage of gross earnings spent for accidents and claims has shown a rapid descent in the last seven years

prone pressure method of resuscitation and other methods of first-aid treatment were demonstrated by the employees of the company.

Another activity of the Forum committee during the year was the staging at Liberty Hall of a giant safety spectacle. It was in five episodes, dealing with different accident hazards to pedestrians and those confronting school children during vacation periods. The episode dealing with street car hazards was handled by company employees by means of a safety court scene, in which the police traffic squad co-operated. Offenders charged with violation of the safety code, most commonly the cause of accidents in which street cars become involved, were properly dealt with by a stern but just judge. This skit, which was written by employees of the company, was cleverly presented and made a deep impression upon the large crowd that witnessed the performance.

A monthly safety parade, in which many local merchants and industrial concerns entered novel and striking floats, was another important activity of the public safety committee during the year. The company entry was called "The Book of Safety." This giant book contained pages measuring 4x6 ft., so arranged that the leaves could be turned. Left-hand pages contained safety messages, such as "Believe Me, It Hurts to Get Hurt." The pages opposite each message were left blank, but during the progress of the parade a company investigator, who is also an excellent cartoonist, drew pictures illustrating these messages. They made a big hit. A picture of the company's float, with a story about the big parade, appeared in the *National Safety Magazine*.

Department of Investigation Does More Than Settle Claims

The company's claim department is known as the department of investigation. It has been made a part of the transportation department, and the relation between it and other divisions of the transportation deparment is one of the most splendid co-operation.

When a man enters the employ of the company, the superintendent of the department of investigation has a friendly talk with him, in which he outlines the company's interest in accident prevention and assures the new employee of every assistance in his work. If at any time an operator displays signs of carelessness, his case is given particular attention by the department. Frank and confidential chats are had with him and the cause is usually determined and eliminated.

The superintendent of the department takes frequent trips over the system during which he talks to operators regarding various phases of the accident situation and encourages them to greater effort and vigilance in the practice of safety.

Whenever children are found playing near the car tracks, stealing rides or in any way molesting the company's service or equipment, their names are obtained and a letter is sent to their parents. Frequently, personal calls are made upon the parents, who are warned of the danger of such practices and are told that the chief interest of the company is to protect the youngster from possible harm and to promote greater safety.

Changes for Safety in Equipment

The company has done much in the way of changing its track and car equipment in the interest of safety. In one instance it moved its track from the side of the street to the center, to allow the street to be widened and reduce the accident hazard. It has equipped all cars with automatic safety doors, marked with the word "Stop," so that it can be seen when the door is opened, to warn approaching vehicles. It has put "Watch Your Step" signs on all cars, has equipped every important street intersection and all dangerous crossings on the system with signs reading "Slow Down—Car Line" and has placed warning signs on both ends of all double truck equipment, reading "Please Do Not Try to Pass This Car on Curve." It has provided an oak wood wheel block for the use of each car on a line that terminates on a rather steep grade near the High School to be used while the operator is changing ends. Other changes have been made in the equipment where they have seemed reasonable to promote safety.

In operation, cars on all the lines are required to stay at least a block apart in all parts of the city, except in the downtown section or on sidings and at important junction points. This has eliminated car bumps.

Signs on Buses Too

An equal amount of thought has been given to the safety equipment of buses. Large attractive stop lights have been installed on the rear of all buses with the word "Stop" on the lens in white letters on a red field. A sign that reads "Toot Your Horn and This Bus Will Gladly Move Over" has been painted across the rear end

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of all buses, both in interurban and city service. All buses have been equipped with awnings, which shade the rear seats, making riding more comfortable. They are installed at an angle so as not to interfere in any way with the operator's vision or proper use of his rear view mirror.

Rearrangement and enlargement of the shops and carhouse during the year enabled a number of added safety precautions as well as fire precautions to be made. Warning signs in English and Spanish have been placed on all high-voltage machinery. The electric welding machines have guards and signs, cautioning workmen and others not to look directly at the arc. All shop machinery and equipment is inspected regularly, and every possible precaution taken to provide safe working conditions.

Trolley Breaks Reduced

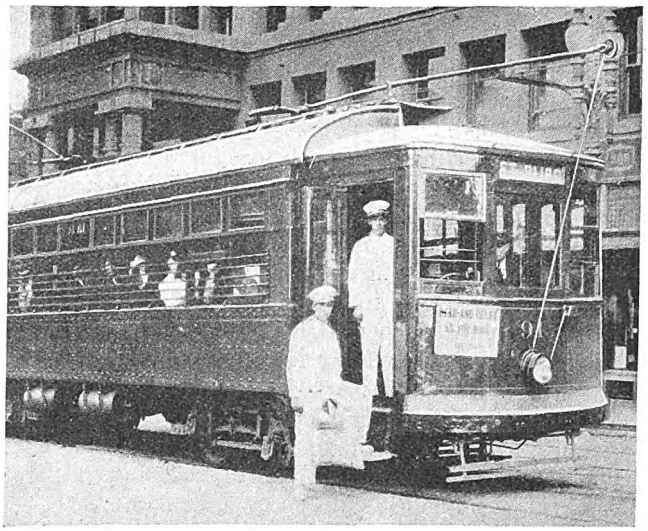
In El Paso, the hot days in summer, followed by cool nights, make maintenance of trolley wires a serious problem on account of the extreme expansion and contraction. This situation has been met by frequent and thorough inspections. The system has been divided into twelve sections, one of which is worked over during each 30-day period. In this way the entire system is gone over every year. This enables the company to keep all overhead trolley wire in excellent condition at all times. Phono-electric wire is installed on all heavy-duty curves.

By the various means described, trolley breaks have been reduced from 239 during 1921 to 21 during 1926.

Better Maintenance of Equipment

The efforts of the company, especially in recent years, toward greater efficiency in maintenance and inspection were not prompted entirely by a desire for greater safety, yet they are found to have an important influence on it. All cars are subjected to a thorough inspection every night. These inspections cover brakes, controllers, trolleys and all wearing parts. In addition to this daily inspection, cars have a general inspection after running from 1,500 to 2,000 miles, depending on the type of equipment. This schedule means that each car has a general inspection every ten or twelve days. Motors are overhauled after each 50,000 miles run.

An ingenious improvement has been made in the engineer's valve, which is the old Type M-28. A small hole $\frac{7}{32}$ in. in diameter was the only brake service position of this valve. It was easy for the operator to push the brake handle past this hole into a lap position, through which no air passed. When this was done rapidly, it frequently happened that the valve handle passed the brake service position to the door open position, creating an accident hazard.



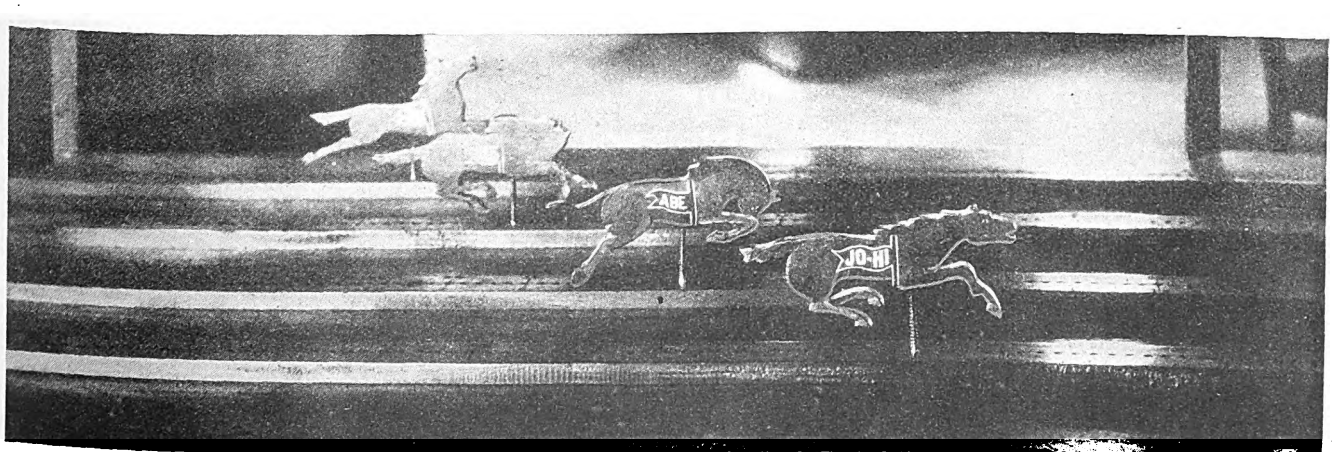
Employees in white uniform sweep out the cars at convenient junction points

The master mechanic of the company perfected an improvement in the valve, which eliminated this difficulty. A second hole of $\frac{5}{32}$ in. diameter, was drilled $\frac{3}{8}$ in. from the original brake service position, and the two were connected by a slot. This changed the old lap, or "handle off," position and made it possible to obtain air all the way between the two positions. The value of this improvement was so obvious that the manufacturers adopted it as standard. The advantage from a safety standpoint is that it eliminates the danger of safety doors being opened before cars come to a full stop, thus avoiding accidents from this cause.

A rule has been passed limiting the speed of cars on all switches and around curves to 4 m.p.h., and it has been found possible to arrange the schedules so that this rule can be followed without any sacrifice of schedule speed between termini. The result has been to prevent many derailments and split switches.

Honor and Bonus System

To maintain the interest of the operators in safety, they are kept fully advised regarding the accident situation at all times. The method used to do this, besides being simple in conception and execution, has proved to be most effective.



Keen competition for the best safety record is maintained among the different divisions. The progress of each during the month is recorded on a miniature racetrack

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A record is posted on the bulletin board daily, giving a list of all street car and bus accidents that occurred on the previous day. A chart is posted to show the number of accident and no-accident days by months over a six-year period.

Each operator has assigned to him a special card for recording chargeable accidents, with blank spaces for listing the various kinds of accidents. They hang in a case inclosed in glass, a separate hook being provided for each card. After an accident is recorded on such a card it is transferred to a similar case marked "accidents this month." Then, if it is found to be a chargeable accident, it is placed in a third case similar in design to the two others, but marked "charged accidents this month." All chargeable accidents are marked on the card in such a way as to distinguish them from other occurrences, and these cards supply at a glance a record and history of the accidents of every trainman.

Each month an honor roll is compiled and posted, containing the names of all those who have worked during the previous month without having been charged with an accident. After a trainman has been on the honor roll for three consecutive months he has a day off with full pay. For each consecutive month thereafter that he remains on the honor roll he has an additional day off with pay. Whenever he is charged with an accident he has to start all over again.

In addition to being placed on the honor roll, a trainman who has completed twelve consecutive months of operation without an accident is given a gold star. Individual stars are given for each year up to and including three. Operators wear these stars upon the sleeves of their uniform coats. Operators who complete four years without an accident receive a large star with a numeral in the center to indicate the number of years they operated without an accident. This system, known as the honor roll system, has been in effect for seven years and at present 70 per cent of all the trainmen of the company are gold star operators.

Several "no accident" day contests have also been conducted. In the last one six consecutive days was the record. The trainmen have taken a great interest in these contests.

To provide a realistic representation of the progress of the contest, a miniature racetrack has been arranged, with a wooden horse and rider to represent each division. Each day that a division has no accidents the corresponding horse is moved forward five notches. With one accident the horse is moved only four notches; if there are two accidents, only three notches, and so on. At the end of each month the winning division receives a banner, which is held until the race is won by another division. Operators and inspectors of the division winning the banner for two consecutive months are invited to a safety banquet. These banquets receive wide publicity from the local newspapers and help to awaken and keep alive a public safety conscience.

Bogey Breakfasts for the Men

Bogey, or 2 a.m., breakfasts for all trainmen constitute another method of rewarding operators for unusual accomplishments in accident prevention. The best previous month's accident record is set as a bogey. During the four years that this system of reward for safety and operation has been in effect there has been a reduction in the number of street car accidents of approximately 66⅔ per cent.

At the bogey breakfast held on Aug. 16, 1926, about 225 were present, including trainmen and their invited guests. The hour was selected because it was the only one in the 24 when all the men could get together. A great deal of interest and enthusiasm was displayed.

Although these measures to promote safety have been taken in behalf of the general public, equal precautions have been taken to provide proper measures of sanitation and health for the employees and the public. The grounds about the properties belonging to the company have been made attractive by the planting of grass, shrubbery and flowers. The storage yard has the appearance of a pleasant and inviting park, as it has a neat iron fence around it, there is a flagpole in the center, the ties and car wheels are stacked in neat and orderly piles, the litter is removed and all tools and equipment are carefully looked after.

The cars are kept clean on the road by a special "white wing" service stationed at convenient junction points. The members of this staff are dressed in white uniforms and are equipped with brooms, dustpans, dusters and other paraphernalia to keep cars and buses neat and tidy at all times. Their appearance at work is evidence to the public that this important matter receives consideration. All cars and buses are disinfected every night by a solution applied to the seats, woodwork, flooring and hand straps.

Safety kits have been installed in the carhouse, transportation club room, bus garage and power plant. They are regularly inspected and carefully equipped for the protection of employees. All employees receive regular instruction in first-aid work and the prone pressure method of resuscitation, and all of them know what to do in an emergency.

Meeting Motor Truck Competition

By Ray B. Needham
Traffic Manager Bamberger Electric Railroad, Salt Lake City, Utah

LIKE many other interurbans, at one time the Bamberger Electric Railroad, Salt Lake City, Utah, depended almost entirely on its passenger business for revenue and handled very little freight. The increasing passenger traffic was due to frequent service as compared to the long-interval steam railroad service, generally adjusted to fit in with transcontinental schedules. Later, through more frequent freight service the Bamberger line built up a large l.c.l. freight tonnage. Both this business and carload traffic were confined largely to local freight on its own line. Still later through freight rates were established with connecting steam lines, with the result that an attractive interline carload business was developed.

Upon the completion of the concrete highway paralleling the Bamberger Electric Railroad between Salt Lake City and Ogden the auto freight trucks started to compete in the handling of the l.c.l. tonnage, and not only transported the shipments between the two cities at slightly greater rates than the railroad's, but included free drayage at point of origin as well as at destination. As a result the Bamberger Electric saw its l.c.l. tonnage gradually decrease, and it was apparent that the only hope of regaining this business was to put on a pick-up-and-delivery trucking service at terminals so as to compete with the trucks.

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Two l.c.l. freight trains, at noon and at night, are operated in each direction daily except Saturdays, Sundays and holidays. Upon telephone notification auto trucks call at warehouses and stores in the retail and wholesale districts and shipments picked up in the morning are delivered to the consignee the same day and shipments picked up in the afternoon are delivered to the consignee early the following morning.

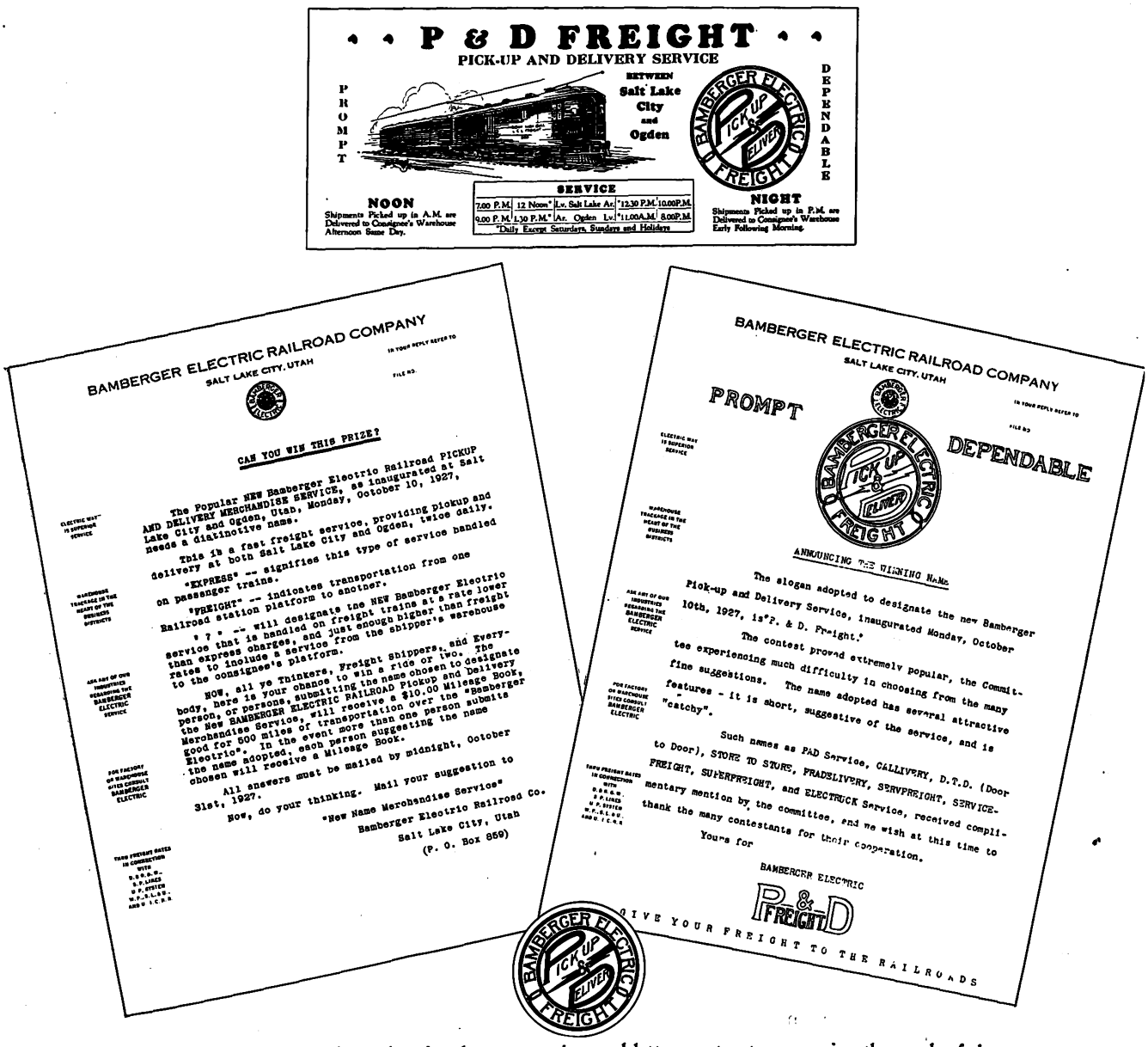
This new service is offered to the public at rates slightly higher than for the regular freight service. As a comparison the rates for the four classes are:

Class	Standard Freight Rate, Cents	P.& D. Rate Cents
1	42½	50
2	35½	40
3	28½	30
4	22½	25

Contest for Naming the Service

After business has been lost it sometimes is difficult to regain, so it was decided the best way to bring this new service before the public was through an advertising New Name Contest. Hundreds of circular letters were mailed to the various shippers and receivers of freight telling them of the contemplated service and asking them to submit a name or slogan to designate it. A prize of a mileage book good for 500 miles of travel on the Bamberger Electric was offered to the person or persons suggesting the name chosen.

The contest proved extremely popular, the committee experiencing much difficulty in choosing from the many fine suggestions. The name adopted was "P. & D. Freight," this being symbolic of the real service. The



Blotters and stickers were used to advertise the new service, and letters sent out announcing the result of the contest which chose a name for the new service

The advertising obtained from this contest could not have been derived in any other way.

While both pick-up-and-delivery service are provided the delivery feature is the most important. Most shippers have consignments to more than one railroad station, and since they operate their own trucks, they prefer to regulate their own delivery to the various railroads, carrying their l.c.l. freight to the railroad platforms. The result is that frequently the railroad under this new service performs only the delivery and not the pick-up.

The company feels that the new departure is a financial success. Although the net profits at the present time are not large the management expects a larger figure with the increase in freight volume.

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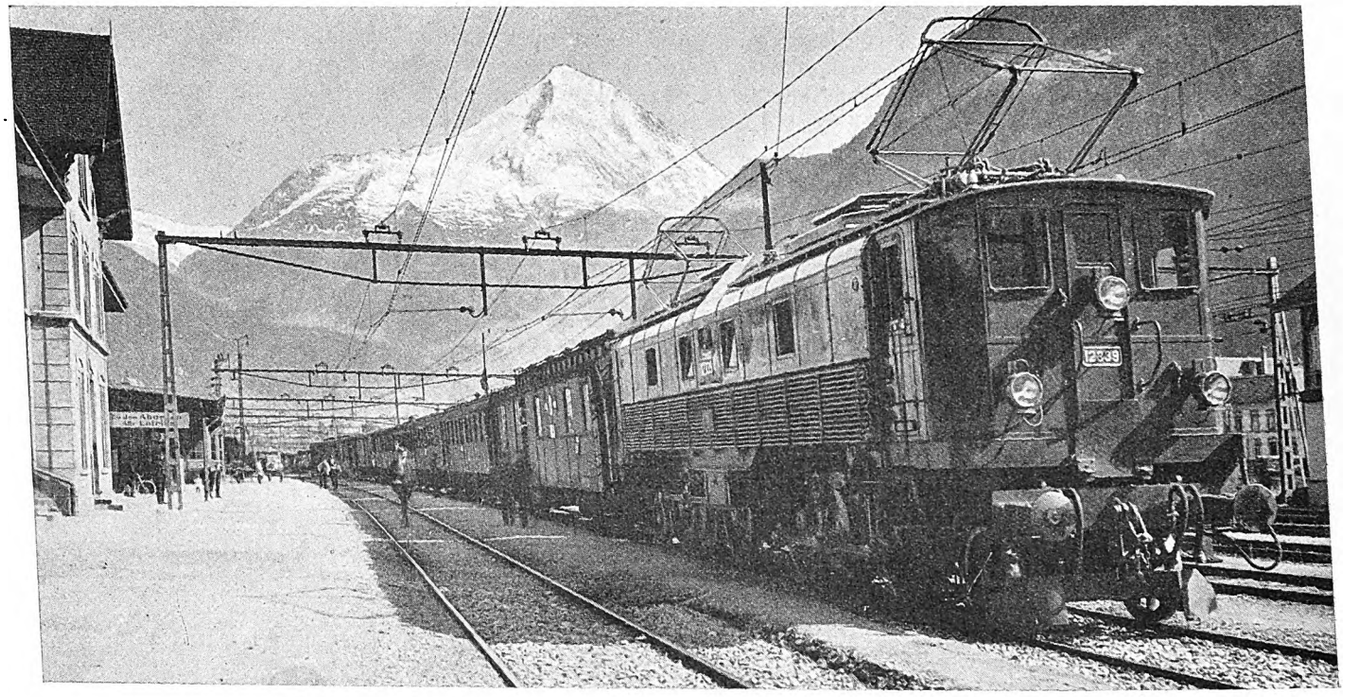

Electric express train on the Gothard line at Erstfeld, north of the principal tunnel. The mountain in the background is the Bristenstock

Electrical Equipment of Railways in Switzerland

Returns Large Profit

A "balance sheet" has been drafted to show the advantages secured by the electrical equipment of the Swiss trunk line railways. It indicates a cash saving during 1926 of nearly $350,000, besides many indirect gains. By the end of 1928 it is expected that 60 per cent of the track of the Swiss Government Railway System will be electrically equipped. On this 60 per cent of the track, 80 per cent of the business of the railways is done

SWITZERLAND is an ideal country for electrical development. It has water power aplenty. Coal is expensive and the many grades on its railway lines make the use of electric power by them particularly desirable because the power which can be applied to a train is practically unlimited. Finally, absence of smoke makes electric operation much more agreeable to passengers, particularly through the many long tunnels which are traversed by the Swiss railway lines.

It is not surprising, therefore, that the Swiss government has been very active in electrical equipment of its railways. During the war, although Switzerland was not one of the belligerents, there was a temporary stoppage in construction because of the delay and difficulty of securing material, especially copper. By the end of 1919, 67 miles of route had been equipped. This has been rapidly increased during recent years. By the end of 1921 there were 136 miles; by the end of 1923, 317 miles; by the end of 1925, 531 miles, and by the end of 1926, 660 miles. Some interesting particulars of this equipment and the financial results obtained are given in the last *Review* published by the Swiss Federal Railways. From it the information following has been compiled:

It was expected that by the end of 1927 the length of route equipped would be 930 miles and by the end of 1928 there would be 1,040 miles of route, with more than 2,275 miles of track equipped with electric power. This mileage corresponds to about 60 per cent of the system and will comprise lines which carry about 80 per cent of the total traffic. These mileage figures are, of course, exclusive of the electrically operated interurban lines under private ownership in Switzerland. With these included, the figures at the close of 1928 are expected to be approximately 2,060 miles of route and 3,280 miles of track.

Power to operate the government railway system is developed for the most part from high-head water-power, acting against impulse turbines. Some of the water has to be passed through mountains, and altogether about 15 miles of tunnels for this purpose have been constructed. The flumes comprise about 6 miles of steel conduit, having a weight exceeding 9,000 tons, while the installed capacity of the impulse turbines themselves reaches about 300,000 hp. In the oil transformers at the

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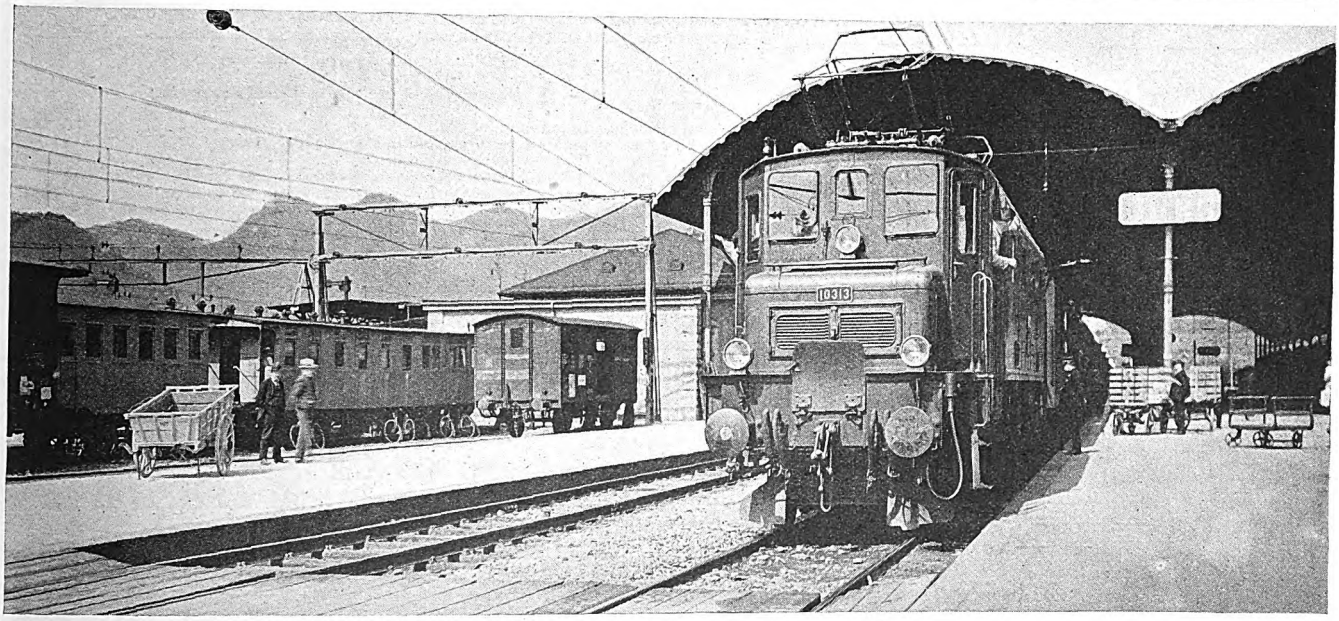


Electric train at Olten, a junction point on the direct line between Basel and Luzern

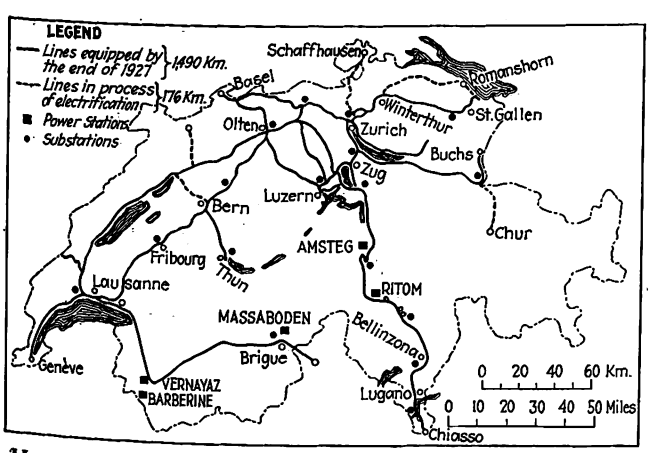
substations there is more than 1,200,000 lb. of oil. The trolley wire represents 3,800 tons of copper, which is suspended from 4,000 tons of catenary cables. The latter are hung on 200,000 insulators, weighing about 11 lb. each.

Despite the tremendous investment which this electrical equipment represents, official reports of the Federal Railway Department show that the financial results secured have been satisfactory. Statistics have been compiled to give what would have been the expense of operating the system by steam as formerly, as compared with electricity. The figures for 1927 indicate that with electric power the cost during 1927 has been at least 1,750,000 Swiss francs ($350,000) cheaper than if steam had been retained. The Director-General of the Department has tabulated the data in the form of what might be called a balance sheet, with debits on one side and credits on the other. It is reproduced herewith to show the saving for the year 1927 of 1,750,000 fr., mentioned above. In this table and elsewhere in this article the francs quoted are Swiss francs, which are worth about 19.3 cents each, or approximately five to the American dollar.

On the Debit Side

On the debit side of this balance sheet the first and most important item is the interest on capital. The investment is estimated at 525,000,000,000 fr. Of this amount, however, 35,000,000 fr. can be deducted because it was received from the government as a subsidy for speeding up the work, so that the charge actually to the department does not exceed 490,000,000 fr. The interest on this sum at 5½ per cent amounts to 26,950,000 fr., or the first item on the debit side.

The second item is the sum of 7,936,000 fr. for depreciation and renewals on the electrical equipment during the year. The third item of 750,000 fr. is for personnel of operation, current maintenance, and energy purchased other than that which would have been required with steam operation. Hence, the total of 38,636,000 fr. is reached as the charges on the debit side of electric railway operation.



Map showing conditions of government railway electrification in Switzerland at the end of 1927

Analysis of Credit Side of Sheet

On the credit side of the sheet the first item is saving in fuel, which is figured for 1927 at 450,000 tons. This coal would have had a value at the frontier, as all coal has to be imported, of 17,100,000 fr. The next item is that of economy in personnel, which is figured at 13,095,000 fr. for 1927. This figure is based on the fact that in 1926 there were 8,616 employees in train service and in the stations, with an eight-hour day, yet the business done was considerably greater than in 1913, when there were 8,886 employees on the payroll with a workday of from 10 to 10½ hours.

It is expected that as electrification is extended further reductions in this item can be made. The saving in manpower comes in various ways. One is that longer trains are hauled. Another is that they come to speed more quickly and make better time, especially on the heavy grades, so that the train crews make longer trips per day than formerly. Then, there has been a great reduction in the force required to make the locomotives ready for their runs and in switching them in the yards.

The third item is saving in locomotive maintenance. Thus, the figures for 1926 show that the maintenance of the electric locomotive averages 30.24 centimes per locomotive-kilometer (9.68 cents per locomotive-mile), although steam locomotive maintenance costs 35.40 centimes per locomotive-kilometer (11.33 cents per locomotive-mile). This is in spite of the fact that the electric locomotive in 1926 hauled an average train load of 293 tons metric, whereas the average for the steam loco-

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COMPARISON OF ANNUAL EXPENSES AND SAVINGS CAUSED BY RAILWAY ELECTRIFICATION IN SWITZERLAND

DEBIT (Charges due to electrical equipment)	Francs
1. Interest at 5½% on the investment required by the electrical equipment	26,950,000
2. Annual amortization and renewal charges on electrical equipment	7,936,000
3. Extra labor required for electrical equipment	3,750,000
RESULTING SAVING. Electric power is cheaper by	1,715,000
Total	40,351,000

CREDIT (Economies secured by electrical equipment)	Francs
1. Saving in purchase of coal	17,100,000
2. Saving in labor on trains and in stations and yards	13,095,000
3. Saving in maintenance of machinery	4,566,000
4. Saving because the use of electric locomotives has made unnecessary the purchase of additional steam locomotives	4,389,000
5. Other miscellaneous savings (maintenance of track, water, lubrication, haulage and switching of coal cars)	1,201,000
Total	40,351,000

motive was only 210 metric tons. Hence the economy for locomotive maintenance has been put at 4,566,000 fr. in 1927.

Estimates on the saving in other items of equipment, such as track, lubrication, etc., including rent of foreign coal cars, is more complicated. Some of these savings are indirect, as increased output of track gangs in tunnels (of which there are a great number on the Swiss Federal Railways) because the working conditions in the tunnels are very much more favorable than under steam traction. However, a careful consideration of all of these items has brought the conclusion that the saving can be put as 1,201,000 fr.

Last, but not least, is the fact that if the government had not had under way a gradual program of railway electrification it would have been obliged within recent years to purchase a large number of steam locomotives annually. Before the war the number so needed averaged about 30 annually, and there is no doubt that without electrification it would have been necessary during the past ten years to have added at least 200 new locomotives to the system at a cost of at least 50,000,000 fr. This sum would correspond annually, for interest and amortization to 4,389,000 fr.

The figures on the credit side, therefore, amount to 40,351,000 fr., as against 38,636,000 fr. on the debit side, leaving a balance as a saving from electrification of 1,715,000 fr.

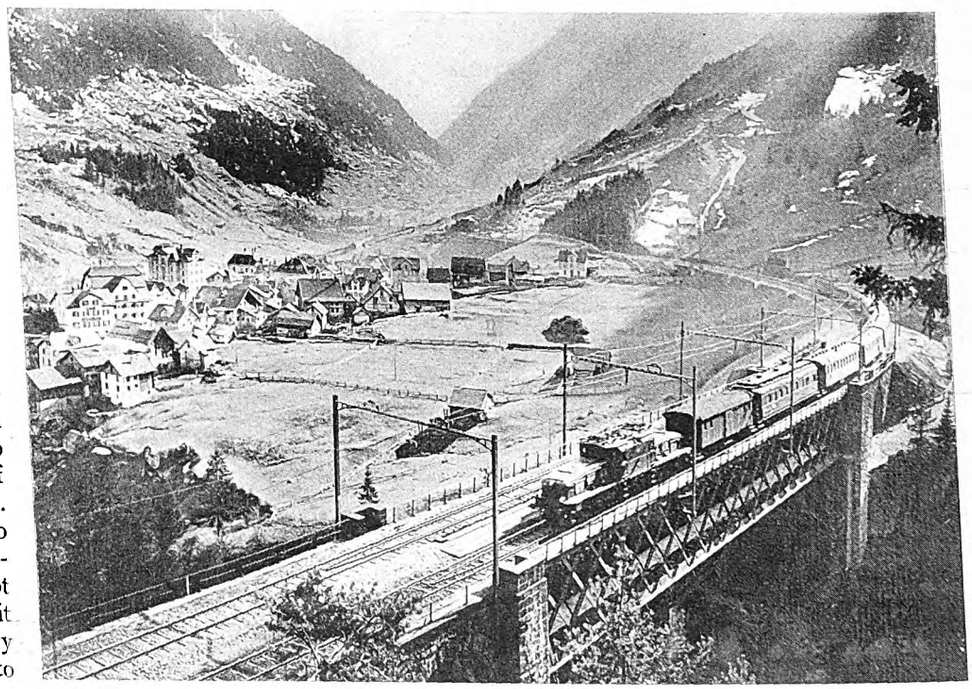
In other words, electrical operation shows an actual cash reduction in expenses, besides possessing many other advantages, such as providing much more comfortable transportation and increasing the capacity of tracks as will be discussed later.

It should also be borne in mind that a considerable part of the electrification was carried on during 1918 to 1923, years which unhappily coincided with an era of high prices, so that the cost of the equipment as given on the debit side of the balance sheet actually was from 75,000,000 fr. to 100,000,000 fr. more than if it had been installed at present-day prices. If these had prevailed there would have been a reduction in the annual charges of from 4,100,000 fr. to 5,500,000 fr.

Besides the direct advantages obtained there are many indirect gains, which are impossible of evaluation.

One of these is the improved hygienic conditions and comfort, not alone of the passengers but of the railway employees, and even of the people living close to the right-of-way, from the substitution of electric for steam power.

Another very important advantage, briefly mentioned above, is the increase in the capacity of the tracks.



Electric express train on the Gothard line, near Wassen. This is one of the most interesting sections of the entire line

The extent of this is shown on a typical line, the Gothard, on which in February last, in a single day (Feb. 22, 1927) it was found possible to haul in one direction (north to south) 22,822 tons of freight, although before electrification the maximum freight hauled over this line in any day of 24 hours was 11,453 tons. This was on March 5, 1915.

An interesting point brought out in the conclusion of the article is that of the immense sum of 680,000,000 fr. which will have been invested in the electrical equipment of the railways up to the end of 1928 not more than one-fifth has had to be spent outside the country. In other words, in round figures, 540,000,000 fr. is the amount which by Dec. 31, 1928, will have gone to Swiss manufacturers for equipment and to the labor of piercing the tunnels, building the power stations and carrying on the other work required. At the same time the annual expenditure outside the country of some 20,000,000 fr. for coal for the operation of the railway system has been made unnecessary. In other words, this money was spent within the country, providing employment for its citizens and contributing to its prosperity.

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Association Activities

Modernization Programs Hold Delegates at C.E.R.A. Winter Meeting

Interest at Cincinnati meeting keen in proposed improvements in both city and interurban railway facilities in territory. Executives impressed with favorable situation in Cincinnati

"IT IS high time to stop crying over spilled milk and to devote attention instead, to improvement of electric railway facilities, so as to attract that portion of the available passenger business which we are in a position to handle." In these terms Martin Ackerman, retiring president of the Central Electric Railway Association, sounded the keynote of the opening session of the winter meeting held in Cincinnati on Thursday and Friday of last week. Mr. Ackerman pointed approvingly to the Cincinnati Street Railway as among those that have adopted the modernization idea. "Here in Cincinnati there is under way a major rehabilitation program which, while not yet sufficiently advanced to show its full possibilities, has for its object the complete modernization of the property from the ground up," said Mr. Ackerman.

Continuing, he stressed the thought that despite evidences of progress on individual properties there are so many more opportunities for improvement still uncapitalized that the industry cannot afford to rest on its oars for a moment. Mr. Ackerman pointed out that there has been little real progress in the development of passenger business on interurban lines of the territory with what he characterized as an extreme lack of co-operation in the arrangement of local and joint time-tables between electric lines.

The old alibi of the automobile is all too often offered as an excuse for inertia and inaction, according to the speaker, who enlarged on the theme that to build electric railway revenues the system concerned must provide service first and then go after the patronage. Speaking especially of the interurbans, he urged a campaign for clean stations, for advertising the stations with electric signs, for the use of lighter, faster cars with quick acceleration, and for the possible use of sleeping, parlor and dining cars on roads which have long through service connections.

Concerning freight business as the possible salvation of many interurban lines Mr. Ackerman explained that while some lines are in a position to do practically an express business, at the present time this service is being sold at freight rates. Concluding, he urged that railway men ride on their own cars in order that first-hand information may be secured regarding the service rendered.

Talking on the street railway situation in Cincinnati, Walter A. Draper, president Cincinnati Street Railway, sketched briefly some of the difficulties which complicated the reorganization of the local company and delayed the inauguration of its progress of rehabilitation which is now well under way. In conclusion he said that in his opinion it didn't matter so much what particular type of franchise a street railway operated under just so the company and the city concerned possessed the determination to work out their problems together in a spirit of mutual understanding.

Accomplishments in Freight Traffic

Tracing the evolution of freight traffic conditions and demands through the past 25 years Frank D. Norveil, general passenger and freight agent of the Union Traction Company, Anderson, Ind., reviewed the accomplishments of that period. He explained how the interurban systems of the central territory in becoming parties to the new tariff, effective Jan. 15, providing through rates to points south of the Ohio River, will find opened a much larger field of service. Speaking of competition from trucks, due in a measure to their giving store-door delivery in many instances, Mr. Norveil suggested meeting it with a "pick-up" and delivery service on the part of the interurban. Pointing out that carload freight traffic represents the cream of all railroad revenues, he urged that electric roads put themselves in shape to accept and handle standard steam railroad equipment; that only by so doing could they expect to build up satisfactory revenues from freight business.

Mayor Murray Seasongood in welcoming the railway men to Cincinnati commended the attitude of the local company's executives and said that the success of the franchise in effect in Cincinnati rested equally with city and company as a joint obligation.

Lucius S. Storrs, managing director American Electric Railway Association, when called upon by President Ackerman for a word, outlined briefly the status of legislation pending in Congress which should concern the electric railway industry and pointed out how essential to the work of the national association was the interest and co-operation of all the railway properties.

One of the high lights of the convention was the short speech made by R. P. Stevens of New York, president of the A.E.R.A., at the banquet on Thursday evening. President Stevens took occasion to explain that the return of the national convention for a third time to Cleveland, Ohio, was decided upon when it was found the facilities for exhibits at Atlantic City could not be completed in time for the railway convention. He prophesied the largest exhibit in the history of the railway industry was in prospect for next fall's gathering.

Judge Baggott of Dayton, Ohio, was the banquet speaker and delivered a humorous address in which legislation, present-day morals, and kindred subjects of current interest were deftly treated.

Nineteen Committees Make Reports

A symposium of the activities of the Central Electric Railway Association was contained in the reports of some nineteen committees. Calling attention to the work already done by the Master Mechanics Association as meriting greater support on the part of the parent organization, George R. Green, retiring president of that group, urged a closer co-operation of member com-

COMING MEETINGS OF *Electric Railway and Allied Associations*

Feb. 13-17—American Institute of Electrical Engineers, winter convention, Engineering Societies Building, 33 West 39th Street, New York, N. Y.

Feb. 17-18—Central Electric Railway Accountants' Association, Hotel Gibson, Cincinnati, Ohio.

March 23—Maryland Utilities Association, annual meeting, Emerson Hotel, Baltimore, Md.

May 2-5—Southwestern Public Service Association, Dallas, Texas.

May 6-12—Union Internationale de Tramways, de Chemins de Fer d'Interet Local et de Transports Publics Automobiles, biennial meeting, Rome, Italy.

June 6-8—Canadian Electric Railway Association, annual convention and exhibits, Toronto, Canada.

July 8-12—Public Utilities Advertising Association and International Advertising Exposition, Detroit, Mich.

July 25-27—Electric Railway Association of Equipment Men, Southern Properties, Cincinnati, Ohio.

SEPT. 22-28, 1928

American Electric Railway Association, 47th annual convention and exhibit, Cleveland, Ohio.

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panies in sending representatives to the meetings. The publicity committee's report recommending the employment of an individual to carry the message of the railway industry to civic associations throughout the Central territory was approved. Recommendations of the safety committee included affiliation with the National Safety Council, the organization on each railway property of a definite program of safety work, and the support of legislation for requiring licenses for automobile drivers. The finance committee's report recommending the increase in member dues from $1 to $1.50 per track-mile to take care of necessary increases in the personnel of the association's Indianapolis office was approved, and the corresponding changes in by-laws suggested in the report of the constitution and by-laws committee.

Cincinnati Franchise Explained

Friday's session of the convention was opened with a paper by E. D. Gilman, Director of Public Utilities of the city of Cincinnati, in which details of the franchise provisions under which the Cincinnati Street Railway operates were explained.

"A franchise such as ours demands the closest co-operation on the part of the officials of both the city and the company," Mr. Gilman explained. "With such co-operation and with a careful study of the physical and financial effects which must be harmonized, the citizens of Cincinnati are going to see within the first four years of the franchise a complete change in their transportation service."

Pointing out the difference between practical and impractical programs of advertising E. T. Gundlach, president Gundlach Advertising Company, Chicago, indicated possible tests which might be applied in endeavoring to ascertain the results actually achieved from specific advertising campaigns.

Mr. Rodger Elected President

A business session concluded the work of the convention at which officers for the next year were elected as follows: President, W. S. Rodger, general traffic manager Detroit United Lines, Detroit, Mich.; first vice-president, L. M. Brown, vice-president Interstate Public Service Company, Indianapolis, Ind.; second vice-president, L. G. Tighe, Northern Ohio Power & Light Company, Akron, Ohio. L. E. Earlywine, Indianapolis, Ind., was re-elected secretary-treasurer.

Three new members of the executive committee were elected: T. A. Ferneding, general manager Springfield-Xenia Railway, Dayton, Ohio; J. A. Greenland, general freight and passenger agent Indiana Service Corporation, Fort Wayne, Ind., and F. J. Foote, master mechanic Indianapolis, Columbus & Eastern Traction Company, Springfield, Ohio, and newly-elected president of the Central Electric Railway Master Mechanics Association.

The summer meeting will be held at Cedar Point, Ohio, the latter part of June.

Central Master Mechanics Discuss Modern Service Requirements

Papers dealing with recent developments in electrical railway equipment occupy attention during Cincinnati meeting held on day before Central Electric Railway Association Sessions

PAPERS and discussion dealing with equipment developments designed to meet present-day operating requirements, and street traffic conditions, occupied the attention of the Central Electric Railway Master Mechanic's Association at a meeting held in Cincinnati, Ohio, on Jan. 25. This one-day meeting, immediately preceding the midwinter meeting of the Central Electric Railway Association, included in addition to the presentation and discussion of papers dealing with improved electric railway equipment, a trip of inspection to the new shops of the Cincinnati Street Railway, manufacturing plants in the city, and the plant of the Cincinnati Car Company. During a luncheon meeting at noon, members of the association were guests of the Tool Steel Gear and Pinion Company.

Variable load brakes, double-reduction W-N truck drive using high-speed, spring-mounted motors, and the use of roller bearings on railway cars, were the subjects of papers by J. S. Y. Fralich, Westinghouse Traction Brake Company; W. J. Clardy, Westinghouse Electric & Manufacturing Company, and M. S. Downes, Timken Roller Bearing Company, respectively. During the luncheon meeting, E. H. Arnott of the Central Service Bureau discussed the initial results of the parking prohibition measure in the Chicago Loop district. President George R. Green, general superintendent Chicago, South Bend & Northern Indiana Railway presided.

Braking Problems with Light Cars

"Introduction by electric railways of light weight relatively large capacity cars has brought braking problems not heretofore encountered," said Mr. Fralich. This he attributed to the fact that single truck cars frequently have a light weight that is only half of the total loaded weight, while many double truck cars weighing approximately 30,000 lb. empty, weigh from 45,000 lb. to 50,000 lb. when loaded with passengers. The wide variation between empty and loaded weight makes it impossible to provide suitable braking facilities under variable conditions of loading with the ordinary type of straight air brake equipment.

The speaker cited average brake design standards on electric railway straight-air brake installations to show that under reservoir pressures varying from 50 to 65 lb. per square inch, braking ratios on empty modern light-weight cars vary from 85 per cent to 100 per cent with minimum reservoir pressure, and from 110 per cent to 130 per cent with maximum reservoir pressure. Even with these braking ratios, which the speaker considered higher than necessary for empty car conditions, in some cases stopping distances are excessive when such a car is fully loaded. This was illustrated by a typical example of the conditions which would be found on a light weight car assumed 30,000 lb. empty and having a maximum passenger capacity of 125. Such a car when empty would have a braking ratio of 100 per cent at 50 lb. cylinder pressure, increasing in proportion as the cylinder pressure increased to a maximum of 65 lb. At 65 lb. cylinder pressure the braking ratio for the empty car would be 130 per cent. On the other hand, this car when fully loaded, assuming passengers at 140 lb. each, would have only 63 per cent braking ratio when the cylinder pressure is at its minimum of 50 lb. Thus, it was pointed out, such a car develops a combination of conditions under minimum and maximum cylinder pressures and under empty and fully loaded operation, in which braking ratios and consequently stopping distance vary by as much as two to one.

Variable Load Brake Gives Automatic Adjustment

It was because of this unsatisfactory braking condition that the Westinghouse company developed its variable load brake, according to Mr. Fralich. This device, he explained, constitutes, primarily, an automatically adjusted feed valve that is set for the brake pressure desired to meet the changing weight conditions brought about by variations from empty to full car passenger loads. Lantern slides were shown to illustrate how the adjustments of this regulating device are controlled by the deflection of the springs between the car body and the truck bolster in proportion to the increasing or decreasing passenger loads, the device being automatically locked against all changes in adjustment except when the car doors are open for the interchange of passengers. The speaker called attention to the importance of this refinement in brake equipment, both from the standpoint of safe operation in congested traffic and increased schedule speeds resulting from the possible reduction in stopping time.

Prefacing his description of the W-N type of drive for electric cars, Mr. Clardy declared that changing transportation conditions demand consideration of developments in equipment which will enable electric cars to meet modern operating requirements. "The surface car of the future," he said, "must be an attractive, comfortable vehicle,

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capable of providing a safe ride at high speeds in a state of quiet enjoyment." Growing traffic congestion and changed transportation standards were held to demand a new type of surface car capable of maintaining high schedule speeds even under dense traffic conditions, and designed to meet present-day standards of safety, speed, comfort, convenience of boarding and alighting, appearance and quietness of operation.

The effect of growing street congestion in slowing down all vehicular speeds has, according to the speaker, directed public attention to the need for relief measures which will naturally result in more definite and scientific regulation of street use. Distribution of rush hour travel over longer periods through the adoption of staggered business and working hours, limitation of heavy trucking operations to the hours after business travel, restriction of parking or its total prohibition in congested districts, regulation of building operations and the storage of building materials to avoid traffic interference, and other proposed measures for the relief of congestion were cited as examples of the trend of public thought toward measures which will open increased opportunity for improved and efficient public transportation service, provided the equipment used is made suitable to take full advantage of the improved traffic conditions which may be expected. An article on the W-N drive appeared in the Jan. 28 issue of ELECTRIC RAILWAY JOURNAL, page 152.

MR. DOWNS GIVES ADVANTAGES OF ROLLER BEARINGS

Mr. Downes, in his paper on railway roller bearings, said that the use of this type of bearing is a question of importance at this time when refinement in engineering and perfection of equipment are dominant thoughts in the minds of progressive railroad men. Furthermore, he explained, the problem of applying anti-friction bearings to all railway service justifies a careful analysis, both from a technical and economic standpoint: first, because it is believed that their use will mean not only a saving of power in regular operation, but also the elimination of hot boxes, and better running conditions generally; second, because they are expected to bring about savings in lubrication, and maintenance expense as well as reduction in the amount of wear and tear to which the rolling stock is subjected; third, because by their use the riding qualities of the cars may be improved so as to give greater comfort to the riding public.

The problem of producing roller bearings that will stand up under the severe service on railway rolling stock has been a very difficult one, according to Mr. Downes. The solution required extensive tests and experiments which often ended in disappointing failure. These failures have ordinarily resulted from one or more of three causes: first, the crushing strains under heavy loads and blows upon the surface of the metals in rotating members and raceways resulted in fatigue and fractures; second, the diagonal twisting and jamming of rollers; and third, the troublesome end thrust which at times may equal 40 per cent of the vertical load.

Extensive use of self-propelled gasoline coaches within the last few years gave considerable impetus to attempts to produce a practical bearing for railway service, the speaker said. Because of the limited power of the gasoline engine, it was necessary to take advantage of every means possible to improve the load characteristics of the car proper, especially with respect to starting and acceleration. Anti-friction bearings were tried as a possible remedy. Their application produced such satisfactory results in improved starting and acceleration, and in fuel economy and general operation, that bearing engineers were encouraged to continue their efforts to produce bearings suitable for all classes of railway service.

Mr. Downes declared that it has now been demonstrated that it is possible to produce roller bearings of sufficient capacity and durability to stand up under the most severe service. He credited railway mechanical engineers for valuable contributions to the development of a successful bearing by showing what the requirements of the service actually were and pointing out the weak spots in bearing design which were to be avoided.

In order to successfully apply roller bearings to the journals of railroad equipment, certain conditions were held to be essential, i.e., the bearing must have a low frictional resistance for all service conditions; it must have a long service life; the design should be such that both vertical and thrust loads or any combination of these loads may be carried by the bearing proper; quick inspection should be possible; the application should be simple in construction and easy to assemble and disassemble; and finally, the bearing should be adjustable. Lantern slides were shown to illustrate how these requirements are met in the case of the bearing developed by the Timken company.

SMOOTHER OPERATION CAN BE EFFECTED WITH ROLLER BEARINGS

In electric car service the advantages of the use of roller bearings were held to be more rapid acceleration, saving in wear and tear on the motors due to the greatly reduced starting resistance, smoother operation during accelerating and braking periods, greater comfort to the passengers and elimination of journal wear and other forms of journal trouble. Mr. Downes said that the application of tapered roller bearings to the armature shafts of electric motors is receiving wide attention. He added that while this application is still more or less in the experimental stage for motors of city and interurban cars, it has been used extensively in the field of general service motors with a high degree of success. The chief advantages claimed from the use of tapered roller bearings on the armature shaft were freedom from lubrication troubles and the practical elimination of wear—thereby reducing maintenance and at the same time preserving a constant air gap in the motor.

Attention was directed to the fact that tapered bearings are used in two types of the light weight electric cars recently developed. Double reduction W-N gear drive trucks are also equipped in the gear box as well as on the journals with tapered roller bearings. The Timken-Detroit experimental car trucks with worm gear drive, use tapered roller bearings on the pinion shaft and on the axles. The extent to which roller bearings will be used on city and interurban cars was held to depend on the economies effected and on the improvement in service that they may make possible.

PRESIDENT GREEN SUMS UP SAVINGS FROM CO-OPERATION

In summing up the work of the Master Mechanic's Association President Green called attention to the importance of savings which are being made for member companies through the co-operative work of mechanical men in the central territory. He emphasized the practical value of the information contained in the papers presented at the meeting, and pointed out the significance of the statements regarding present day transportation equipment requirements in the introduction of Mr. Clardy's paper. In turning over the gavel to F. J. Foote, superintendent of motive power and equipment Indiana, Columbus & Eastern Traction Company, who was elected president for the new year, Mr. Green expressed appreciation of the co-operation given by the several standing committees of the association in making possible the progressive program of work that had been completed during the past year.

Mr. Foote in turn declared that the performance of the association had more than justified the conception of its originators. He emphasized the importance of continuing the established policy of making the business of member companies the primary objective of the association's meetings, and of discouraging entertainment and social activity.

Because of the important part which they play in the work of improving electric railway practices and in the programs of the master mechanics' meetings, a modification was made in the requirements for membership to permit manufacturers' representatives to join the association as associate members at a cost of $1.50 per year. Applications for membership are to be received by mail at the office of Secretary Earlywine in Indianapolis.

A. W. Redderson, superintendent of equipment Indiana Service Corporation, Fort Wayne, Ind., was elected first vice-president and L. E. Earlywine was re-elected secretary-treasurer. Charles Sigler, T. Nicholl, J. W. Osborne and A. J. Challeen were elected members of the executive committee.

The next meeting was tentatively fixed for some time in May, to be held, at the invitation of the General Electric Company, at Erie, Pa.

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Southern Equipment Men Discuss Progress Made in Service Improvements

Latest developments in motor drive, hand brakes, relation of mechanical department to claims and other subjects also receive attention of the meeting

BETTER service and a general improvement in the railway industry in the Southern territory last year, with forecasts of even better results during the coming year, were generally indicated during the three day session of the Electric Railway Association of Equipment Men, Southern Properties, held at the Roosevelt Hotel, New Orleans, La., on Jan. 25-27. The association met with the mechanical division of the Sothwestern Public Service Association.

Cincinnati was selected as the next meeting place, the dates being July 25-27. Robert M. O'Brien, superintendent of rolling stock and shops New Orleans Public Service, Inc., was chosen president; A. Taurman, Birmingham Electric Company, vice-president, and L. O. Eiffert, Alabama Power Company, Birmingham, secretary-treasurer.

That the results obtained by member companies since the formation of the association six years ago, have fully justified its organization, appeared to be the general opinion not only of responsible executives who attended the sessions but of the entire membership. It was pointed out that considerable good has been accomplished by the interchange of ideas of the equipment men. Not only has it resulted in increasing efficiency all along the line but it actually has brought about a reduction of maintenance cost.

A. B. Paterson, vice-president New Orleans Public Service, Inc., stated that the organization of this particular association has proved very valuable in this respect. It began at a time when all properties were in a more or less critical condition, due to the after effects of the war, and it has contributed through earnest efforts, to greatly increased efficiency and reduction in the cost of maintenance. This naturally has brought about an improvement in the service to the public which is absolutely essential on account of the competition from automobile travel. As a result very little street car mileage has been abandoned in the South. The industry as a whole has been benefited.

The convention itself was one of the most successful ever held, according to officers of the association. The attendance set a new record for the association, more than 200 registrations having been filed. They included delegates from all the Southern properties and associate members and representatives from other properties and plants in other sections of the country. There was little opportunity for entertainment and the delegates devoted most of the three sessions strictly to business.

The first day of the convention was given over to addresses of welcome by Mayor O'Keefe and President H. B. Flowers of the New Orleans Public Service, Inc., reports of officers and nine prepared papers on subjects of special interest to the industry.

W. H. McAlonev of the Georgia Power Company, Atlanta, president of the Association, in his annual report, among other things, said: "We are continually looking toward the betterment and improvement of rolling equipment; looking toward the comfort and convenience of the riding public, for despite the increasing numbers of private automobiles the majority of the people find it most convenient and comfortable to use the street cars, and they are rapidly learning it is very much more economical.

"The experience even in many of the smaller cities has proved beyond a doubt that there has not yet been devised any form of city transportation that equals cars on rails for handling the greatest numbers in the smallest street space with speed.

"If the tailor makes the man, so it is that the good looking street car holds up the appearance of a city. New Orleans has a right to be proud of her street car system and management. Her record of traveling 200,000 car-miles between car failures is the best in our association and not equalled anywhere on the continent. Besides it is being done more economically."

The first prepared paper was read by R. S. Bull, superintendent of equipment, Pittsburgh Railways, on "Observations and Outstanding features of the 1927 Cleveland convention." Descriptions were given by Mr. Bull of the "Rail Sedan" of the St. Louis Car Company, a Birney safety car of the same manufacturer, the J. G. Brill "1928 model" car, the Cincinnati Car Company's "Atlanta Car," the car exhibited by the Springfield Street Railway, the Joliet car built by the Cummings Car & Coach Company and others. He also told of the five different types of trucks that were exhibited and of the miscellaneous car equipment representing new developments.

George H. Ingles, claim agent Virginia Electric & Power Company, spoke on the "Relation of the Mechanical Department to Claims." He stated that the shopmen can be of real assistance to the claims department by studying the accident reports carefully, inspecting the damaged equipment and reporting immediately. Equipment men also can promote safety, he asserted, by watching for mechanical defects and keeping the equipment in good order. Comfort and good-will of the passengers is a big factor when accidents occur and shopmen are largely responsible for gaining public favor, according to Mr. Ingles.

The latest developments in railway motor drive were treated in a paper by J. K. Stotz, motor engineer department Westinghouse Electric & Manufacturing Company. He discussed fully the truck design, brakes, gear unit and motors of the Brill 1928 model car which is equipped with the W-N double reduction motor drive and Westinghouse 1425 motor. He listed the advantages of the new equipment and gave information concerning operating costs. An article on the double-reduction gear drive with the high-speed spring supported motors appeared in the Jan. 28 issue of the JOURNAL.

In discussing the subject, "Maintenance vs. Repairs," Gus C. Kraus, assistant to superintendent of rolling stock and shops New Orleans Public Service, Inc., outlined the practice of his company in keeping its rolling stock in the best possible condition. Briefly, the practice consists of overhauling car equipment and car bodies on a periodic basis to reduce maintenance costs and equipment failures to a minimum.

"Cost of Maintenance" was the subject of a paper by A. Taurman, superintendent of equipment, way and structures Birmingham Electric Company. He stated that many properties were misinterpreting the standard maintenance account classifications and that difficulty was being experienced in comparing accounts of properties for this reason. Some of the contributing factors for the variation in costs, according to Mr. Taurman, are: Differences in age and type of cars and the condition in which the equipment has been maintained; individual operating conditions on the various properties; extent of supervision and shop facilities; and differing accounting practices.

A detailed description of the car washing machine of the Pittsburgh Railways was given by J. D. Barr, inspection engineer of that company. Mr. Barr related how the machine was developed and explained carefully how to set it up for operation and how to use it. Features of the machine were listed and its applications outlined. The machine was described in the JOURNAL for March 12, 1927.

Two types of hand brakes, the external or clasp type and the internal expanding type, were described by A. D. McWhorter, general superintendent Memphis Street Railway. He related the operating experiences of several roads which have experimented with hand brakes and gave valuable information and data on their operating characteristics. An abstract of this paper will appear in a later issue of the JOURNAL.

W. G. Walker, railway department General Electric Company, told what the manufacturers are doing to facilitate repairs and to reduce the cost of equipment maintenance. Manufacturers aim to supply operators with replacement parts as speedily as possible and assist the equipment men by supplying drawings, diagrams and information needed in the maintenance and operation of equipment.

A paper on "Co-operation Between

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the Instruction Department and the Rolling Stock and Shops Department" was presented by E. J. Murphy, superintendent of instruction and employment New Orleans Public Service, Inc. Good public relationship is often harmed by poor service which can be blamed on improperly trained and incompetent motormen. Realizing this and appreciating the value of public good will the New Orleans Public Service established a training school. The course of instruction of this school and all details of the equipment and methods used were described in Mr. Murphy's paper. An abstract will appear in a future issue.

President McAloney complimented the authors of the various papers for the thorough and complete manner in which the subjects were handled. He said they were so ably handled that there was little room left for criticism or discussion. The delegates put in a long day Wednesday, being in session from 9 o'clock in the morning until nearly 6 in the afternoon, with only one interruption for luncheon.

Methods of Providing Smoother Service

The second day of the convention was given over entirely to the discussion of questions relating to the progress each company has made in 1927 to provide smoother service for the car riding public and the improvements made necessary to do this. The discussions indicated that the improvements in the industry have been general throughout the southern district. The greatest interest was evinced in all the subjects brought up. Mr. McAloney, the retiring president, declared that the results accomplished last year and improvements contemplated for the coming year clearly indicated the value of these meetings and fully justified the organization of the associations.

More than 150 delegates attended the banquet given at the Tip Top Inn on Thursday night. There were no scheduled speeches and only a limited number of men were called upon to give brief talks. Mr. Paterson was chosen toastmaster and was given a vote of thanks for the admirable manner in which he performed his duties in that capacity. He commented on the splendid attendance and spoke of the good work being accomplished at these get-together meetings for an interchange of ideas between the equipment men of the various properties.

Mr. Flowers after renewing his cordial welcome to the delegates, complimented them on the good work they have done and are still doing. He referred to some of the problems of the street railway companies and pointed out how everything has to be operated on the strict basis of efficiency and economy. He declared that there must be the utmost co-operation between all the departments. In referring to the association of equipment men Mr. Flowers said that the organization has done a great deal toward bringing about this co-operation. He touched upon the acute traffic situation and urged upon them the need of reliable service in order to offset traffic delays on the system, which have been caused by no fault of the operating companies.

Following the election and installation of the new officers, retiring president McAloney was given a rising vote of thanks for the very able manner in which he presided over the sessions at Atlanta and New Orleans. Mr. McAloney made a very versatile presiding officer and kept the delegates in good humor at all times.

Following the adoption of other resolutions of thanks to officers of the New Orleans Public Service, Inc., and others the convention adjourned. Later the delegates made an inspection of the properties of the New Orleans Public Service, Inc.

New Yorkers Study Ways to Speed Up Service

Relief of traffic congestion and faster acceleration and retardation were principal subjects of discussion at mid-winter meeting of New York Electric Railway Association

SPEED was the keynote of the mid-winter meeting of the New York Electric Railway Association held at the Hotel Commodore, New York City, Jan. 31. That "local transportation must keep on the move or die" was the theme of an address at the morning session by Lucius S. Storrs, managing director, American Electric Railway Association. In the absence of Mr. Storrs the address was read by James W. Welsh. An abstract will be published in a future issue. The effect of signal lights on traffic congestion was the subject of animated discussion at the afternoon session. A paper on this subject by Ralph W. Emerson, vice-president and general manager, Cleveland Railway, was presented by L. D. Bale. An abstract will appear in a future issue. High speed traction motors and the importance of proper braking equipment were other subjects discussed.

In the absence of W. G. Gove, president of the association, W. E. Thompson, vice-president, presided at the morning and afternoon sessions. N. W. Storer, consulting railway engineer Westinghouse Electric & Manufacturing Company, presented a paper on the "High Speed Traction Motor," relating the evolution of the present-day motor. He outlined the various problems to be met in designing the high-speed motor and explained why the Westinghouse Company found the use of 300 volts with two motors in series desirable. Mr. Storer listed three advantages of the high-speed motor: The motor weight is carried entirely on the truck frame, removing the motor dead weight from the axle; the motor is so small that a smaller wheel is possible, permitting a lower floor level, and the equipment offers a substantial reduction in weight over the standard single reduction equipment. An abstract of the paper will appear in a future issue.

The car builders' views on the high-speed motor were presented by George L. Kippenberger, vice-president and assistant general manager, St. Louis Car Company. He stated that appearance of cars and luxuriousness of appointments have been given much attention but that the important factors of high speed, smoothness of control, quietness of running and easy carriage should receive consideration also. According to Mr. Kippenberger, the new motors should prove another forward step in modernizing equipment.

The technical discussion of the motors was continued by H. L. Andrews, assistant engineer railway department, General Electric Company. He pointed out the advantages of 600-volt operation over 300-volt with two motors in series, and gave figures to show that there was no saving in weight with the new-type trucks. The paper in abstract form will appear in a later issue of the Journal.

W. H. Sawyer, past president, American Electric Railway Association, commenting on Mr. Storrs' paper, said that any railway man who feels that nothing can be done to improve conditions on his property should get out of the business to make room for a more wide-awake man. The wheels of the electric railway industry will not keep on turning forever of their own accord. We must all get behind and push. Mr. Sawyer also emphasized the necessity for the industry supporting the progressive manufacturers in the development of new equipment.

R. F. Carbutt told how the electric railway in a small town can be made prosperous and successful.

The traffic problem in New York City was the subject of a talk by Hon. Philip D. Hoyt, deputy police commissioner. He pointed out that the primary duty of the police is protection, and that facilitating traffic movement is secondary. K. W. Mackall, engineer, Crouse-Hinds Company, talked on the subject of traffic control, asserting that proper co-ordination of street car and vehicular movement can be attained with correct signals. He also pointed out the advantages of short cycles. Harvey N. Smith, bureau of gas and electricity, Syracuse, N. Y., emphasized the importance of considering the needs of the street railway in designing and installing traffic lights.

"Brakes as they affect schedule speed and accidents," was the subject of the paper presented by E. R. Fitch, district engineer Westinghouse Traction Brake Company. He emphasized the impor-

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tance of good brake performance in providing satisfactory service and showed how improving the brakes and brake rigging assisted in speeding up schedules. He also stressed the importance of brakes in reducing the accident hazard. An abstract will appear in a future issue.

J. S. McWhirter, superintendent of equipment Third Avenue Railway System, in his paper which was presented by H. L. Bowman, commented on the use of hand brakes as an important means of preventing accidents and mentioned the generating stop as another resource for the motorman. He also described and gave the advantages of using magnetic track brakes.

The final paper on brakes was read by Hugh Savage, superintendent of equipment Brooklyn City Railroad. Two factors over which the brake designer has no control were discussed by Mr. Savage: The variation in rail surface condition and the unstable equilibrium of passengers who are standing or walking in a moving car.

At the banquet, President Gove, who served as toastmaster, announced that this was the most successful meeting in the recent history of the association. More than 100 attended the day sessions, and some 550 were present at the dinner.

The principal speaker at the dinner was Roland B. Woodward, general secretary of the Rochester, N. Y., Chamber of Commerce. He made an appeal for fair treatment for the mass transportation agencies, showing that this utility is essential to modern city life. Mass transportation is a prerequisite to mass production. The industry, he said, has had many burdens imposed on it that are unfair, and which should be removed, since they are in the end borne by the riders. It must be prosperous in order to give good service. This is the only great industry that has been a laggard in its public relations. As a result the public has not been properly informed. There is more conspicuous ignorance about the business than about any other of which he has knowledge. More publicity is needed to secure public support.

Captain Irving O'Hay, U. S. Army, retired, gave an interesting account of his many experiences as a soldier of fortune.

American Association News

American Executive Committee Meets in Cincinnati

SUCCESS of the plan to encourage state and sectional associations to affiliate with the American Electric Railway Association, which was instituted by changes made in the national association's constitution at the last convention, was indicated by a report of the membership committee made at a meeting of the executive committee in Cincinnati, Ohio, on Jan. 27 by Chairman C. E. Morgan. Applications of seven sectional associations which are listed elsewhere in this issue were approved at the meeting. Additional applications from the Maryland Utilities Association and the Central Electric Railway Association were received too late to be submitted to the executive committee.

The report of the membership committee, supplemented by a special report from General Secretary J. W. Welsh, also indicates that the plan of consolidating the financing of the managing director's office with the general dues of the association is meeting with the approval of the industry as evidenced by the payment of dues to date. It seemed obvious from the figures submitted that the budget estimates for the year, upon which this year's dues were based, were approximately correct, and that the association may expect to complete the current year in sound financial condition if the present trend of dues payments by member companies is maintained.

The executive committee met at luncheon in the Queen City Club as the guests of Walter A. Draper, president Cincinnati Street Railway. Those present at the meeting included the following: R. P. Stevens, president, C. E. Morgan, L. S. Storrs, T. B. MacRae, J. S. Kubu, R. H. Dalgleish, H. H. Norris representing Edward Dana, A. J. Manson representing M. B. Lambert, E. F. Wickwire, T. W. Casey, D. W. Snyder, Jr., Thomas Finigan representing W. S. Cutler, J. R. Fitzpatrick, Robert I. Todd, J. W. Welsh, R. F. Carbutt, F. G. Buffe, H. L. Mitchell, W. W. Holden, H. B. Potter, J. P. Pulliam, P. G. Carlton representing R. B. Stearns, W. S. Rodger, W. E. Wood, W. R. Power, W. A. Draper, Thomas Conway, Jr., Thomas Fitzgerald, Charles Gordon, Claude Van Auken, F. C. J. Dell, Leslie Vickers, G. C. Hecker, C. J. Murphy, Lambert St. Clair.

In the absence of Chairman Paul Shoup, the report of the publicity committee was presented by Mr. Welsh. The principal point being stressed in this year's work is that of the need for an adequate fare by electric railways. The report indicated that good use is being made of the Association's moving picture films which were prepared last year. The entire group of twenty films has been in almost constant circulation since they were prepared.

Because of the fuller attendance at this meeting than at the last meeting of the executive committee, Thomas Conway, Jr., chairman of the sub-committee on depreciation of the National Relations Committee reviewed the status of the work being done with respect to the matter of depreciation hearings before the Interstate Commerce Commission. Dr. Conway explained that the hearings before the commission on electric railways have been put over until the commission has finished with the re-hearings of the steam railroad and the telephone cases. Further sessions on these re-hearings are scheduled to start on March 14.

Dr. Conway reported that his committee has held a number of meetings in the preparation of the electric railway case for presentation before the commission. Data has been received from a total of about 40 companies representing a large proportion of electric railway mileage. It is now estimated that the electric railway case will not come before the commission until sometime in the spring.

The seriousness of the depreciation hearings to the electric railway industry cannot be over-estimated, according to Dr. Conway and his committee. Information already received from representative properties indicates that an order similar to that applied to the steam roads would produce a large immediate increase in operating expense charges of electric railway properties. This would seriously handicap the present program of improvement and rehabilitation just as the industry is emerging from the series of almost insurmountable obstacles and handicaps with which it became burdened during the post war period. An order such as the commission issued in the case of the steam roads would affect all electric railways, in the opinion of the committee, and would not be limited only to those roads reporting to the Interstate Commerce Commission. If the Federal Commission should issue a depreciation accounting order, Dr. Conway explained, the various state commissions which have adopted the Interstate Commerce Commission's classification of accounting, would be very likely to follow any policy with respect to depreciation accounting that the Federal commission might lay down.

The need for setting up adequate depreciation accruals is recognized by the electric railways, in the opinion of the committee, and there is no disposition on the part of the industry to question the commission's authority. It is the intention of the committee to strive for an order which will permit electric railway fares and income to be adjusted gradually so as to make possible the setting up of adequate depreciation accruals without doing this in such a manner as to wreck the industry's credit and prevent it from continuing the process of improvement which it has been making such a valient effort to carry out under the obstacle of inadequate revenues. Dr. Conway reported further that there is no intention on the part of the committee to waive any of the rights of individual members to testify for themselves before the commission.

A report for both the managing di-

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rector's office and for the Committee on National Relations was made by Managing Director L. S. Storrs in the absence of Chairman J. H. Hanna. Mr. Storrs said that a number of sections of the Federal Transportation Act are becoming of increasing interest to electric railways as the growth in the freight business of many interurbans brings them more nearly into the classification of railroads. Appointment of C. D. Cass as assistant to the managing director, to handle some of the many duties arising from Washington developments which affect the interests of electric railways was confirmed by the executive committee for such period as his services may be necessary. The expense of this work is being assumed by several properties whose interests in the developments are directly affected.

Mr. Storrs announced the findings of the committee of judges on the Anthony N. Brady Safety Award. The medals in each of three classes were won by the Louisville Railway, El Paso Electric Company and the Tide Water Power Company, respectively. Formal presentation of the awards is to be made at a meeting to be held under the auspices of the American Museum of Safety in New York, on February 17th.

Activities of the committee on co-operation of manufacturers will, according to a report by Chairman Wickwire, be directed along lines suggested by Managing Director Storrs; i.e., promotion of a basic 10-cent car fare for electric railways. The committee is at present co-operating in the preparation of an album containing pictures illustrating the industry's early days and showing by contrast with newer types of equipment, the progress which has been made.

Resolutions covering conditions to be observed by exhibitors at the annual convention, somewhat similar to those which have governed during several years were passed by the executive committee. These resolutions are printed elsewhere in this issue.

A request by the educational committee, that the educational luncheon which was held under the auspices of the committee at the last convention, be made one of the regular luncheon meetings on the convention program this year, was referred to the program committee.

Leslie Vickers, economist of the Association, reporting for the committee on taxation, said that an effort has been made in co-operation with other organizations to obtain a reduction in federal corporation taxes. He called attention to a legislative matter of considerable importance to utilities; namely, the amendment to the tax bill by Representative Garner which eliminates from the bill Section 118, which permitted consolidated reports to be filed for several companies. Mr. Vickers emphasized the importance of striving to have Section 118 put back in the bill.

Based upon figures covering the budget for the 1928 Cleveland convention, the executive committee voted to charge a rate of 60 cents per square foot for inside exhibit space at Cleveland. The rate for outdoor track space will be $2 per lineal foot. These rates were decided upon after a careful analysis of the convention budget and estimates of the probable sale of space. It was the intention of the committee in setting the 60-cent rate, to provide an income which would just balance convention expenditures.

Convention committee appointments by President Stevens were read by Secretary Welsh. These were printed in last week's issue of ELECTRIC RAILWAY JOURNAL. Reports of progress being made by the several affiliated associations were made by T. B. MacRae for the Accountants Association, J. S. Kubu for the Claims Association and R. H. Dalgleish for the Engineering Association. Mr. Kubu read a draft of an imputed negligence law proposed by the Claims Association, which President Stevens referred to the policy committee. Mr. Dalgleish was granted authority, upon request of the Engineering Association, to ask manufacturers of new types of electric railway truck drives for contributions not to exceed $500 each, to defray the cost of tests on new type drives, to be conducted by the Bureau of Standards in Washington.

Representatives from various state and sectional associations attending the executive committee meeting were called upon by President Stevens for brief comments. These included F. G. Buffe, Midwest Electric Railway Association; H. L. Mitchell, Pennsylvania Street Railway Association; W. W. Holden, Southwestern Public Service Association; J. P. Pulliam, Wisconsin Utilities Association; R. F. Carbutt, Metropolitan Section; P. G. Carlton, representing R. B. Stearns, New England Street Railway Club; W. E. Wood, Virginia Utilities Association; W. S. Rodger, Central Electric Railway Association and W. R. Power, Kentucky Utilities Association. Mr. Buffe invited the executive committee to hold a meeting in Kansas City at the time of the next Midwest Electric Railway Association meeting there late in May or early in June. A similar invitation was extended by Mr. Holden for the Southwestern Association.

At the end of the business meeting a review of statistics and trends in the industry was presented by E. J. Murphy, statistician of the Association. The next meeting of the executive committee was fixed for March 30 at Association Headquarters, New York.

Engineering Executive Committee

MANY projects of the Engineering Association were reviewed at a meeting of the executive committee held at association headquarters, New York, on Jan. 30. Members present were President R. H. Dalgleish; vice-presidents F. H. Miller, W. W. Wysor and L. D. Bale; past presidents C. H. Jones, P. V. C. See, F. McVittie, E. M. T. Ryder and G. C. Hecker; and Daniel Durie and Charles Rufus Harte. Committee chairmen H. H. George, H. F. Brown and J. Y. Bayliss were also present.

Announcement was made that appropriations for the study of rail corrugation by way and structures committee No. 12, car design by rolling stock committee No. 3 and noise reduction by rolling stock committee No. 9 were approved by the executive committee by letter ballot and were authorized at the American Association executive committee meeting held Nov. 11.

The final report of the subjects committee was approved by letter ballot, and complete assignments for committee work have been sent to all committee members. In connection with the design of a proposed standard track switch for a 200-ft. radius, the question arose as to whether standardization of track switches is necessary or desirable. It was decided to go ahead with the design of the switch without reference to standardization.

A report on revision of rules of procedure was made by Mr. Miller. The method of taking letter ballots received considerable attention. On motion of Mr. Miller, seconded by Mr. See, it was decided to continue for another twelfth month the procedure of adoption of standards by letter ballot according to the method used last year.

Announcement was made that a meeting of the committee on revision of constitution and by-laws would be held to bring the constitution and by-laws of the Engineering Association in line with the changes adopted by the American Association at the last convention.

The editing of the association's proceedings was discussed, the idea being to reduce the volume by eliminating all extraneous material and abstracting such papers as do not seem to have permanent value sufficient to place them in the records in full. Since the volume of proceedings for the current year had already been set in type, it was decided to make no change in the form until next year.

It was pointed out that a change in the style of numbers in the engineering manual had been authorized last year so that the new sections do not repeat a number in words and in figures. On motion of Mr. Jones, seconded by Mr. Miller, it was decided to make the changes in new sections and those sections which come up for revision so that they will be changed over to the latest form as quickly as possible when reprinting.

The results of a number of letter ballots on Manual sections were reported. A new letter ballot on special track work was approved for submission to the membership. The Manual Committee was authorized to make editorial changes where necessary in one of the Manual sections.

On the subject of convention pro-

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grams, it was voted to appoint committees to prepare programs for each of the main divisions and that the chairmen of the standing committees, with others to be appointed, should constitute a committee to prepare the program for the joint session.

In connection with the presentation of committee work on the convention floor, Mr. George recommended that brief abstracts of each special committee report be prepared so that they can be presented in a minimum time.

The afternoon session of the executive committee was given over to presentation of progress reports by the chairmen of the several divisions and a number of announcements by the secretary.

Several Manual revisions were brought to the attention of the committee.

Mr. Bayliss, chairman of the purchases and stores division general committee, told of joint work that is being done with the Accountants Association. It was voted by the executive committee to approve this arrangement as it was thought that the two groups have much in common and should arrange to do as much work together as they can.

For the heavy electric traction committee, Chairman Brown told of the plans for the year. The work will be along the lines laid down at the last convention. Mr. Brown referred to possible duplication of committee work. This has been referred to in the report of the committee on heavy electric traction.

Mr. See made a brief report on behalf of the rolling stock division telling of the status of the committee work, and Mr. Bale made a similar report for the power division.

A proposal was made to study the application of labor saving machinery in shops. This proposal was discussed at some length. It was thought that such equipment is of great value today, and it was voted to appoint a committee to investigate the value of such equipment.

On the subject of concrete poles, there was a question raised as to the advisability of including special types of concrete poles in the assignments to the proper committee. It was decided to leave this matter until next year.

Considerable time was given over to announcements of the various American Engineering Standards Committee activities in which the association is interested. Co-operative work being done with the Division of Simplified Practice of the U. S. Department of Commerce and with a number of other associations was also referred to.

Motor Drives to Be Tested

PLANS for testing the most recent type of motor drive were made at the meeting of a sub-committee of rolling stock special committee No. 3 on car design. This meeting was held at the Bureau of Standards in Washington, D. C., on Jan. 19. At the meeting were present Dr. H. C. Dickinson, Dr. M. D. Hershey and S. A. McKee, all of the Bureau of Standards; President R. H. Dalgleish of the Engineering Association; H. H. Adams, chairman of special committee No. 3, and C. Bethel, W. J. Clardy, F. H. Pritcher, C. A. Burleson, N. R. Brownyer, H. C. Maddux, A. L. Kasemeier and J. A. Brooks.

Arrangements for the test were discussed in detail. It was decided that the various elements of the drive units should be tested separately. For instance, universal joints, reduction units, and journal bearings would each be tested for its efficiency, the tests being made from standstill up through the entire speed range. By means of these tests it will be possible to determine the relative efficiencies between journal bearings of the anti-friction type and plain bearings. The tests will be made with the lubricants recommended by the manufacturers and later tests will probably be made with lubricants selected by the Bureau of Standards that will represent as nearly as possible conditions to be met in cold temperatures. Representatives of the Westinghouse Electric & Manufacturing Company and the General Electric Company will look into the matter of supplying motors to be used as dynamometers.

The question of making road tests was left in abeyance for further consideration.

In all seven reduction units were submitted for consideration of the representatives of the Bureau of Standards.

New Association Members

FOLLOWING out the plan made possible by a change in the constitution of the American Electric Railway Association, adopted at the 1927 convention, seven state and sectional associations were elected to membership at the meeting of the executive committee held at Cincinnati on Jan. 27. Besides these there were two associate members and 33 individuals elected. The list of new association and associate members follows:

ASSOCIATE MEMBERS

American Appraisal Company, consulting engineers, Milwaukee, Wis.

Richard Sachse, consulting engineer, Los Angeles, Cal.

STATE AND SECTIONAL ASSOCIATIONS

Arkansas Utilities Association, Little Rock, Ark.

Canadian Electric Railway Association, Toronto, Ont.

Iowa Electric Railway Association, Davenport, Iowa.

New England Street Railway Club, Boston, Mass.

Oklahoma Utilities Association, Oklahoma City, Okla.

Public Utilities Association of Virginia, Richmond, Va.

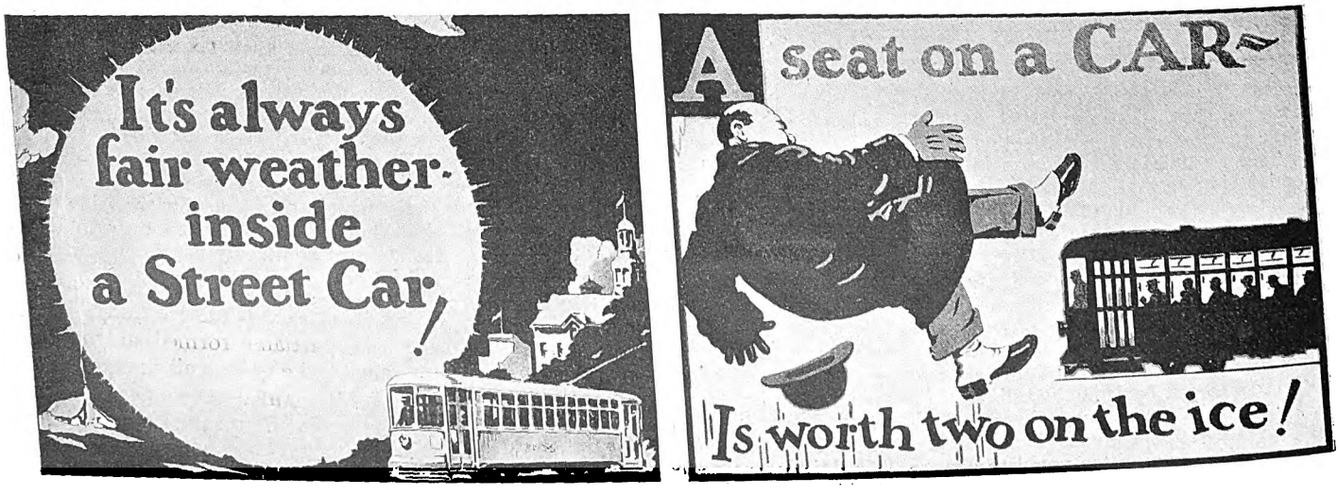
Southwestern Public Service Association, Dallas, Tex.

Posters Stimulate Winter Riding

POSTERS to aid in inducing car riding during the winter months have been prepared by the advertising section of the American Electric Railway Association under the supervision of the manufacturers committee on co-operation, of which E. F. Wickwire is chairman.

"It's always fair weather—inside a street car!" and "A seat on a car—is worth two on the ice!" are the inducing words on the attractive posters.

They are being offered to manufacturers as well as to electric railway operators and can be obtained directly from the association's advertising section at a nominal price. A limited quantity will be distributed free to manufacturers.



Attractive posters to stimulate street car riding during the winter months

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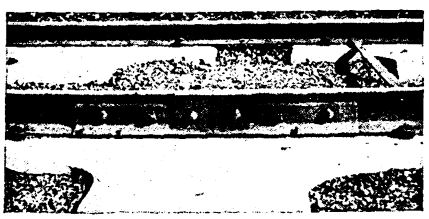
Maintenance Methods *and* Devices

Manganese Bridging Plate Prevents Cupping

MANGANESE plates, which bridge the rail joint plates to give ½-in. bearing surfaces for the wheels, are used by the Pittsburgh, Harmony, Butler & New Castle Railway. These plates have prevented the usual cupping at the rail ends. Each plate is 3¾-in. high and ⅜-in. thick, except for the top face or bearing surface, which is ⅝-in. thick. The manganese reinforcement is secured by two bolts passing through the two inner holes of the joint plates and the end holes of the rail. It is then welded to the bottom flange of the joint plate as shown in the accompanying drawing.



The manganese reinforcing plate is secured by two inner bolts

Where the cupping is advanced, the plate is secured by bolts passing through the second and fourth holes. The welded bridging plates have been used for two years and have proved satisfactory.

Mr. Fisk says it is "time to retire"—your out of date equipment.

Power Sander Speeds Car Work

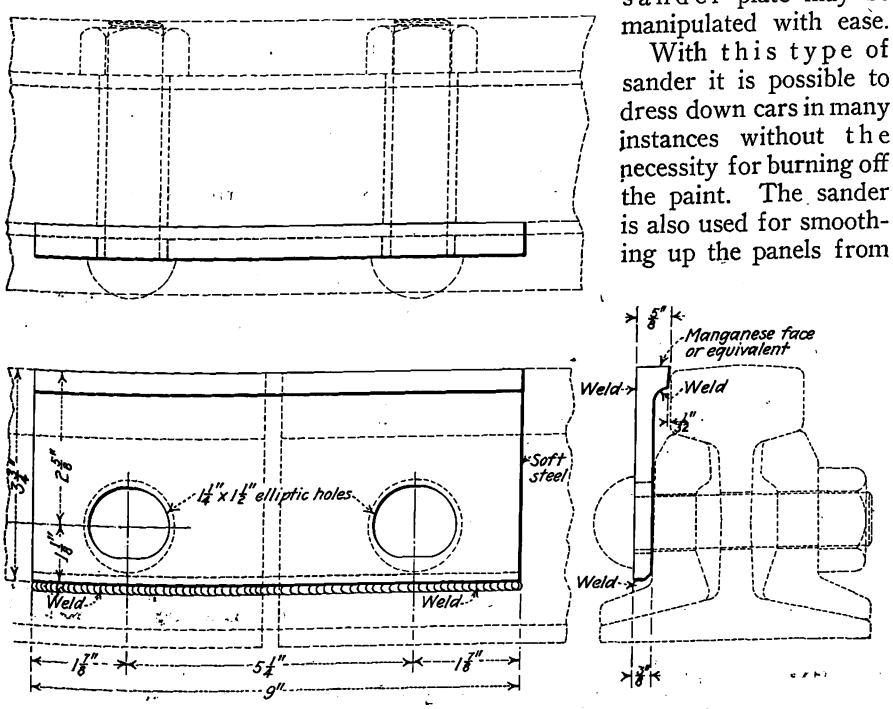
WHERE large surfaces, such as the sides of cars, must be prepared for painting, sanding by the use of blocks covered with sandpaper is slow and tiring to the workman. In the shops of the Twin City Rapid Transit Company, St. Paul, Minn., electric sanders are used largely for this work. The accompanying illustration indicates the method of using the sander.

The sandpaper is placed on a circular plate of steel, which is driven by bevel gearing and a flexible shaft from a small motor. The device is mounted on a portable stand. As the workman moves along the car the motor stand is moved readily by a pull on the flexible shaft. Little difficulty is experienced in keeping enough slack so that the rotating sander plate may be manipulated with ease.

With this type of sander it is possible to dress down cars in many instances without the necessity for burning off the paint. The sander is also used for smoothing up the panels from which the paint has been burned off.

This motor-driven sander makes the preparation of the car for painting an easy matter

The sander also can be used wherever sandpapering is required. It does excellent work in smoothing off floors and smoothing off car roofs before the canvas is put on. It is even used on old roofs where the paint has become badly cracked. Where it is necessary to do sandpapering work above the floor level it is an easy matter to suspend the sandpapering machine from an overhead crane or runway so that it can be moved easily.



The plate is welded to the bottom flange of the joint plate and to the upper part of the rail

Punch Used to Form Switch Iron Handles

LOOPED switch iron handles are formed on a punching machine in the shops of the Chicago Surface Lines. The equipment used was illustrated in the brief submitted by the railway for the Coffin Award. Two strokes of the forming punch are needed to complete the loop, which is but partially formed at the first stroke. One heat is all that is needed in the forming, since the time lost between the first and second strokes is but a short interval, necessary for turning the piece over.

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New Equipment Available

Sleeve Connector

PLUG, socket and tapered sleeve form a three-part connector placed on the market by the Columbia Machine Works and Malleable Iron Company, Brooklyn, N. Y. It is designed particularly for use in connecting motor leads, storage batteries, compressors and other apparatus used by electric railways. The plug section is formed by reducing the diameter at one end, the opposite being bored to two diameters for cable strands and insulation. At about the center of this section a thread is cut, which is engaged by the thread of the tapered sleeve. The socket part is bored and reamed, the opposite end being drilled two diameters for cable strands and insulation. The outer diameter of the female end of the socket is turned with a rather abrupt taper and is slotted to form prongs, which are drawn down rigidly on the plug section by the tapered sleeve. With the exception of slotting the socket with a milling machine saw all of the parts are made by lathe turning, and so particular accuracy is insured. The plug and socket parts are soldered on their respective cables and ample threads of the plug and tapered sleeve are provided for wear.

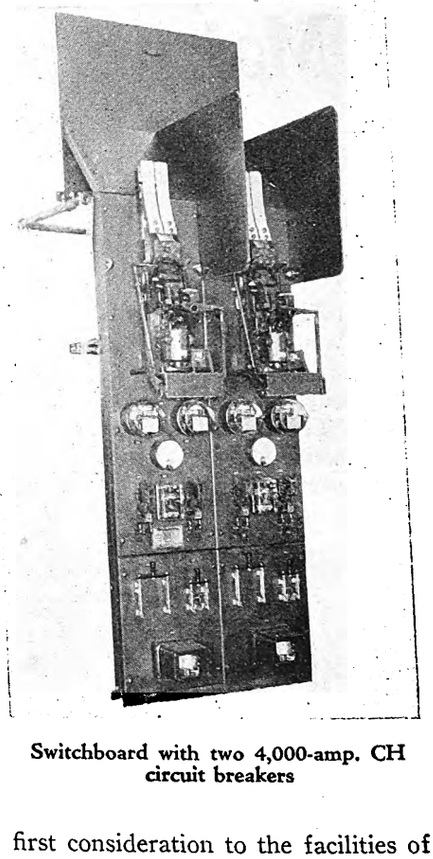
Heavy-Duty Circuit Interrupters

INCREASED demand by railways and other distributors of direct-current power for automatic and semi-automatic substations has made necessary a strong circuit breaker that can interrupt large overloads a great number of times and still be in condition to carry its rated load without overheating and without immediate repairs or cleaning.

This demand is being met by the Westinghouse Electric & Manufacturing Company through the production of its type CH carbon circuit breaker. This breaker is now being made in 2,000, 4,000 and 8,000-amp. ratings, 750 volts. The 2,000 and 4,000-amp. ratings can also be used on 1,500 volts. These breakers are not provided with self-contained overload coils, but can be made to trip on overload by means of relays. They are provided with a closing magnet and a detachable pole handle to close the breaker by hand in case of loss of voltage on the closing circuit. Feeder breakers are usually provided with a shunt trip which opens the breaker when the short circuit detector operates to energize the coil.

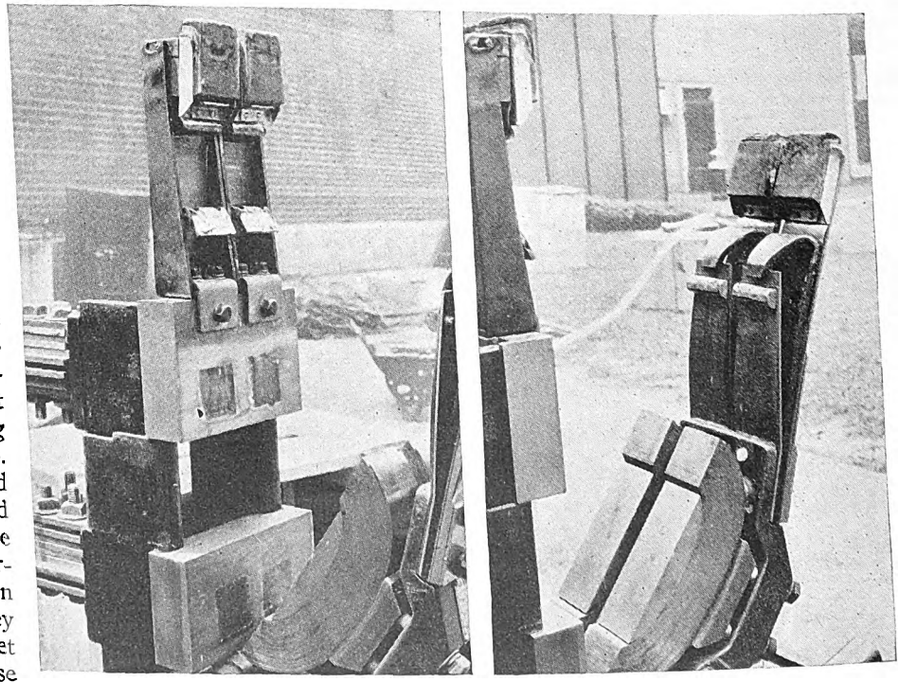
The type CH circuit breaker has a very wide opening between the arcing contacts when in the open position and the opening between the stationary contacts and the brush is also large, making it impossible, especially in the pedestal type, for the arc gasses to hover close enough to the live parts to maintain an arc between the moving and stationary contacts when opening a short circuit of any magnitude that can be produced by any existing concentration of direct-current rotating machines.

Through the courtesy of L. D. Bale, superintendent of power Cleveland Railway, the Cedar Avenue substation was made available for testing the CH breakers. An accompanying illustration shows the condition of the moving and stationary contacts after 260 operations opening 20,000 to 30,000 amp. at 600 volts. The Cedar Avenue substation has eight 1,500-kw., 600-volt rotary converters, all of which were running. The fact that the converters at Cedar substation were of a design without high reluctance commutating poles and consequently were liable to flashovers if subjected to too great an overload, together with the necessity of giving first consideration to the facilities of the railway, prevented placing of greater overloads on the breaker.



Switchboard with two 4,000-amp. CH circuit breakers

The 4,000 and the 2,000-amp. CH breakers have also been tested for interrupting capacity in the Westinghouse high power direct-current laboratory on overloads up to 40,000 amp. with similar results to the tests made in Cleveland.



Contacts after opening 20,000 to 30,000 amp. 260 times.
At left—Stationary contacts. At right—Movable contacts

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News of the Industry

Little Progress on Boston Bill

THE bill calling for a 15-year extension of the public control of the Boston Elevated Railway will not have as smooth sailing through the Massachusetts Legislature as was expected. Many complications are developing. The first hearing on the bill was regarded as unsatisfactory since only a small amount of information was brought out to guide the legislative committees.

At the suggestion of Governor Fuller and others the committees have voted to ask the Boston Elevated directors and some of the leading stockholders to appear at a public hearing to give their views on the merits of the pending bill, and on the future of the road. The governor also suggested that the committees should call Joseph B. Eastman, chairman of the Interstate Commerce Commission; James F. Jackson former chairman of the Elevated board of public trustees and of the Massachusetts Department of Public Utilities, and Andrew Marshall, a former member of the Elevated board of trustees and others.

There is much sentiment on Beacon Hill in favor of a return of the property to the owners, and also for the immediate acquisition of the road by the state.

The redeeming feature of the present situation is that the Legislature took hold of the question as the very beginning of the session and will have plenty of time to deliberate over it and decide upon some solution. A feeling seems to be developing in the western part of the state that the Commonwealth should not do too much for the Boston Elevated unless it is willing to do the same for electric railways in other parts of the state. The country senators and representatives are inquiring along this line.

Bureau to Send Out Virginia News

The Virginia Public Utility Information Bureau has recently been organized with headquarters in Richmond. Allyn B. Tunis is director.

Baltimore Fare Decision Deferred

Final decision in the application of the United Railways & Electric Company, Baltimore, for an increase in fare from 7½ to 10 cents has been delayed by the Maryland Public Service Commission until after Feb. 10. Hearings in the case were concluded in December.

Before acting on the fare case the commission will determine the valuation of the company's easements. This valuation was placed at $7,000,000 by the commission last summer, but the case was carried through the courts. The Maryland Court of Appeals ruled that the commission should value the easements but said that the method used was wrong. So the case went back to the state body.

Franchise Extended Again in Chicago

Another 30-day extension of the franchise of the Chicago Surface Lines has been granted by the City Council. This extends the franchises until Feb. 29.

Schenectady Fare Hearing Postponed

Hearing before the Public Service Commission scheduled for Feb. 1 at Albany on the petition of the Schenectady Railway, Schenectady, N. Y., for permission to increase its fare rates has been postponed. Postponement was due to the application by the city for a writ prohibiting the commission from proceeding with the question. The city alleged that rates on some lines were fixed by franchise restrictions.

Seven-Cent Fare Asked in New York

Interborough Rapid Transit asks commission for that rate, failing which it will seek court aid. The company sets up claim of confiscation

DIRECTORS and officers of the Interborough Rapid Transit Company, New York, have reached the conclusion that definite action must be initiated by them by filing 7-cent fare schedules to secure for the company's investors and for the public substantial relief from the conditions now existing. The company takes the position that the policy of the city of New York and the attitude of the Transit Commission thus far, under the advice of special counsel to that body, have brought about conditions which compel protective measures in public interest. It says:

A rate of fare of 7 cents per passenger on each subway division and Manhattan division operated by the Interborough company will constitute no more than a just and reasonable rate of fare on each division respectively and will yield no more than a fair and reasonable return upon the value of the properties actually used by it in the public service in its operation and devoted to the public service and no more than a reasonable compensation for the service so rendered.

In order to aid in the preparation and presentation of the matter along the lines which have been recognized and upheld by the courts as to other public utilities, ex-Justice William L. Ransom, who has had considerable experience in that field, has been retained as counsel. He will assist counsel for the company in bringing before the Transit Commission and the courts the facts which have impelled the company to action.

The company has repeatedly pointed out to the public authorities the urgent need that it be permitted to charge fares and earn revenues which will reflect the present price level and enable the company to meet with maximum efficiency the needs of those dependent on its facilities. It contends that all of its efforts to induce fair and businesslike consideration of the pressing problems have led only to violent political attacks and to drastic threats of oppression, designed still further to destroy the company's credit and its ability to fulfill its obligations to its patrons. A statement by the company says:

Under these well-known circumstances the directors of the company have decided to take the necessary steps to exercise and establish the rights of investors and patrons. The matter will be removed from the forum of vituperative assertion and harangue, and the pertinent law and facts definitely established. Our expectation is, of course, that the Transit Commission, in its quasi-judicial capacity, will treat the matter fairly and diligently, as the urgent conditions demand; but we squarely face the probability that the right of this company to charge a fare which will enable it to perform its public functions and escape confiscation will be brought before the courts for clarifying review and for final determination, unless the action of the Transit Commission is along lines which make that review unnecessary. The steps now taken have proved to be the only way of dealing with the extremity to which we have been forced.

The petition filed with the Transit Commission tells its own story and summarizes the grounds of the company's application. The company cannot continue to render a 1928 service at 1928 costs of materials and rates of pay of labor, at a rate of fare fixed in 1913, based upon the wages, costs and purchasing power of money then prevailing. Every business man knows the force of the economic conditions which compel this change in fares. The orders of the Transit Commission, the threats of its special counsel and the radical change in the city's policy since 1913 have intensified and aggravated the effects of the changed price level.

The Interborough Rapid Transit Company does not desire to charge more or less than the rate of fare which will conservatively enable it to pay proper wages and meet present-day operating costs, together

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with an adequate return upon the property devoted to the public service, in order that its credit may be so restored that it may procure sufficient new capital for improvements. It is unwilling longer to impair its service by trying to skimp along on revenues less than its fair right. Like other public service companies, it should charge neither more nor less than a reasonable fare, based on elements recognized by the courts, and subject to revision downward or upward as costs and conditions require.

That is the established and generally recognized right of other public service companies, with excellent results for the public by way of first class and adequate service. We believe it is likewise our right and our duty to seek it.

It should be remembered that in no event can the company make a dollar of profit from an increased fare in excess of the amounts which it is entitled to retain under the terms of its contracts with the city.

As the purchasing power of the 1928 dollar is approximately 60 cents, it will be appreciated that a 7-cent fare has a purchasing power somewhat less than the 5-cent fare of 1913.

2 per Cent Participation Earned by Philadelphia Men

The co-operation of employees of the Philadelphia Rapid Transit Company, Philadelphia, Pa., during 1927 has earned them the 2 per cent of P.R.T. gross earnings promised for added efficiency. President Senter says, however, that even greater effort will be necessary to earn a similar added wage in 1928.

The closing months of 1927 brought a falling-off in earnings because of depression in industrial activity. Mr. Senter said:

> We must be wide awake to the need for economy in every department, so that operation may be kept at the lowest cost consistent with good service. At the same time we must do everything possible to increase riding. A more attractive service will largely offset a temporary loss in normal riding. You can make car, bus and cab riders out of people who now use their private automobiles or walk. Attractive service means constant courtesy, regular spacing of cars, clean and bright equipment, and the thousand and one added touches which nobody knows so well as the man on the job.
>
> Once we had the transportation field to ourselves. Now the private automobile is striving with us to serve the public's transportation needs. We are in a battle. Speed, comfort, economy and convenience are our weapons.
>
> Let us fight hard, but let us at the same time stick to the rules of the game. While putting our own best foot foremost let us not trip up the other fellow. This means that we must give a square deal to all users of the city streets—the 20 per cent who use their own private cars, as well as the 80 per cent who depend upon us for transportation. In helping others we help ourselves, and that goes in heavy traffic as truly as anywhere else in life.

Subway for Milwaukee

A half-mile subway and rapid transit line on an east and west right-of-way unobstructed by street crossings and arranged to improve greatly street car traffic conditions was announced on Jan. 31 by S. B. Way, president of the Milwaukee Electric Railway & Light Company, Milwaukee, Wis.

The plans for the immense improvements, to cost in excess of $4,000,000, have been submitted to Mayor Hoan and have been approved by him and within a few days will be sent to the Common Council for its approval.

The new right-of-way will run from a junction on the rapid transit lines on Fortieth Street east generally along the north bluff of the Menomonee valley, entirely free from both grade crossings and street traffic, to a point on Eighth Street north of St. Paul Avenue. At this point the subway will begin.

From Eighth Street and St. Paul Avenue all trains operated over this line will run underground into the Public Service station at Third and Michigan Streets. In addition to the subway the line will have two stretches of elevated tracks, 500 feet across Hibernia Street and 1,100 feet on St. Paul Avenue east of Twenty-fifth Street. The entire length of the new project is 2.8 miles.

Running Street Car in Window Big Attraction

A miniature street car in a window of the Arkansas Power & Light Company's offices in Little Rock, Ark., that actually ran up and down a track representing Main and Fifth Streets of the city attracted favorable attention recently. There was a guessing contest in connection with the event, which was a part of the traction company's big advertising campaign to center attention upon the electric railway system. The car actually ran 95 miles, but guesses ranged from a fraction of a mile to 1,000,000 miles.

Group Insurance for Wisconsin Valley Employees

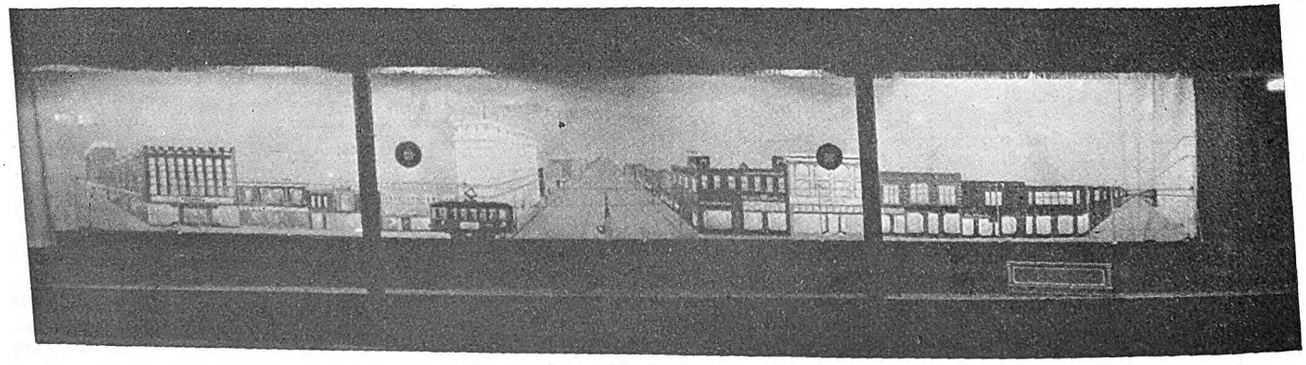
The Byllesby group insurance plan covers all employees of the Wisconsin Valley Electric Company, Wausau, Wis., and its subsidiaries effective Jan. 1, 1928. An announcement to this effect was made recently by H. L. Geisse, general manager of the company.

W. H. Montross, general superintendent, will supervise this insurance work on all properties of the company There are 324 employees eligible for this insurance.

Being Neighborly in Elmira Paid

"What's wrong with our service"? And then followed an avalanche of complaints, vituperation and even profanity. That was fifteen years ago in Elmira, N. Y. But with that discouraging beginning Frederic H. Hill, vice-president of the Elmira Water, Light & Railroad Company, laid the foundations of good will so that today its officers are in demand as speakers in schools, at luncheons and at community groups. The answer as told by Mr. Hill in the December issue of *Nation's Business* is "keeping a public utility human." Today the company can boast of successful customer-ownership campaigns, a personnel with good home talent operating its services sometimes on part time and in school vacation periods.

As an example of co-operation on the part of the employees he said that in a recent drive to stimulate interest in better home lighting 63 per cent of the employees took part. An average of more than six cartons of frosted lamps per employee was sold, the railway department selling the most. Among the leaders were five conductors. Some of the trainmen had become well acquainted with their passengers and sold many lamps on the cars.



Window display depicting street car operation in Little Rock attracted much favorable attention

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Of course, there are some complaints in Elmira, but they are a matter of routine. However, there are no longer any tricks "because we are not soulless."

85,248 Handled in Rochester Subway in Month

Passenger traffic on new subway railroad in the bed of the abandoned Erie Canal at Rochester, N. Y., totaled 85,248 for December, its first month of operation, James F. Hamilton, president of the New York State Railways, operators of the railroad, has announced.

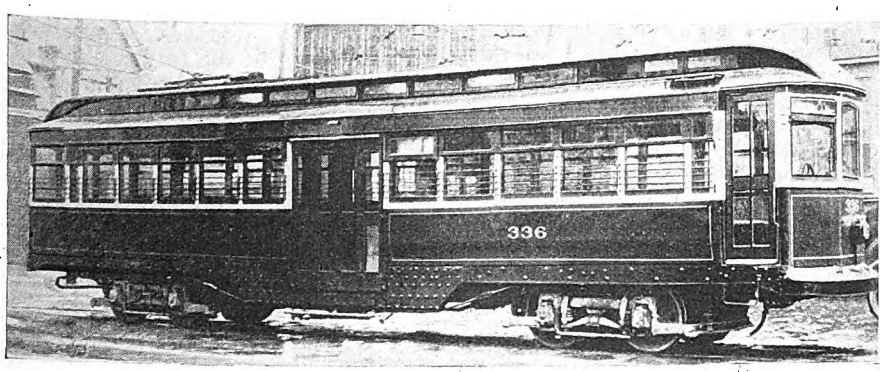
In view of the limited operation of the subway so far, part time service only being maintained, railways officials expressed gratification over the showing for the first month.

Passengers within the city totaled 59,680, while those on the Rochester & Eastern interurban line, which uses the subway, totaled 25,568.

It is expected that installation of the automatic signal system, lack of which is preventing complete operation of the line, will be completed by Feb. 15. When this work has been finished, two-minute trolley movement will be possible. Fifteen-minute service has been in order under the present experimental stage of the subway operation, with only two cars running. Mr. Hamilton said:

> When the installation of the automatic signal system is completed, it will be possible to operate cars according to the demands of traffic. A clear track one or two stations ahead will be indicated by green lights; yellow lights will indicate distance of only one station clear. Red lights mean stop.

The Rochester & Syracuse and the Rochester, Lockport & Buffalo interurban railways will use the subway as soon as switching installation and signal work are finished. Special work is required for the Rochester & Syracuse connection because that line is double tracked on right-track operation while the subway railroad is on left-track operation.



Type of car operated on new subway at Rochester by New York State Railways

Informative Pamphlet on Illinois

"Know Illinois," the second edition, compiled by the Illinois Committee on Public Utility Information, has been circulated far and wide. This booklet gives in condensed form some important statistics about Illinois.

Governors Deliver Annual Messages

Emphasis laid on transit before Massachusetts body—Governors of New Jersey, North Dakota, Virginia and Rhode Island report

AN ECHO of Governor Smith's idea of transportation as a factor in community life, mentioned in his annual message and referred to in the ELECTRIC RAILWAY JOURNAL issue of Jan. 7, 1928, was heard in the words of Governor Alvin T. Fuller of Massachusetts in his address to the Legislature of Massachusetts. He said that he regarded the Boston Elevated Railway situation the paramount problem before the Massachusetts Legislature this year. That public control through public trustees would enable prompt carrying out of many needed improvements and additions, and would bring the system up to that degree of efficiency and accommodation to which the metropolitan area was entitled was his belief. Generally speaking, he favored a short rather than a long extension of public control. He suggested careful consideration of the problems of additional subway facilities so as to reduce the burden on the car rider. He said that he would be happy at all times, and whenever convenient, to collaborate in the preparation of a bill that would be fair to the traveling public without being unfair to the stockholders, and which would, at the same time, provide for the extension of the rapid transit system and improve transportation facilities. There was no one thing before the Legislature with the opportunity of doing so great a service to large numbers of people as the proposed legislation, which had as its object, improved transportation facilities for the metropolitan district.

Across the Hudson River, Harry Moore, Governor of New Jersey, addressed his second annual message to the 152nd Legislature of New Jersey on Jan. 10. He stressed the necessity for improvement of facilities for carrying commuters to and from New York City. The problem could not be solved by the state of New Jersey alone but had to be co-ordinated with improved transit facilities for New York City, Westchester County, Long Island and Staten Island. Two problems before the state of New Jersey were the regional or interstate problem—the matter of adequate communication with the city of New York, Westchester and Long Island, and the intrastate or local problem. He said it was clear that the creation of new, intrastate suburban passenger facilities in northern New Jersey were bound up with the interstate passenger problem. The Suburban Transit Engineering Board was actually functioning and developing an engineering plan. An encouraging point was advice that the Legislature of New York would follow the initiative taken by the state of New Jersey and would pass complementary legislation, enabling the Port Authority to proceed.

Lying, as it does, between the great metropolitan areas of New York and Philadelphia, New Jersey must care for traffic passing between these two states and having its shore line on the Atlantic Ocean for a distance of more than 150 miles, developed as resorts, it must likewise make ample provision for the traffic created thereby.

Other states whose governors made reports to the Legislature during January included North Dakota, Virginia and Rhode Island.

Governor Harry Smith Byrd told the General Assembly of Virginia, convened in regular session on Jan. 11, that the gasoline tax had vindicated those who were in favor of this tax for the purpose of building roads rather than floating bond issues. For 1927 at least $7,500,000 would be collected, and should go in 1928 into more than $8,000,000. The total road funds available for the next biennium, namely $32,004,680, was an increase of $1,100,000 available for street highway systems over the last two years. His report showed the assessments of the physical properties of each class of public service corporations for the years 1925, 1926 and 1927. For 1927 the assessment on electric railroads was $10,289,179: for 1926, $10,937,086, and for 1925, $10,574,866.

Motor vehicle transportation had made remarkable advancement since its regulation by the state, and sections of the state formerly isolated and inaccessible were now in easy and quick communication with adjacent communities.

Governor Aram J. Pothier of Rhode Island told the General Assembly at its annual January session that highway development was to continue so that the traveling public might share in the desired and desirable improvements.

Chicago Parking Issue Under Advisement

Court hearings on the injunction proceedings relative to parking in the loop district of Chicago, Ill., which were in progress on Feb. 1 have been concluded and the case has been taken under advisement until next week. The parking decree went into effect on Jan. 10. The various steps in the introduction of this ordinance and its passage have been followed in the ELECTRIC RAILWAY JOURNAL.

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Municipal Ownership Suggested for Tacoma

Purchase of the railway system owned by the Tacoma Railway & Power Company, Tacoma, Wash., by the city of Tacoma, was urged at a recent banquet of the Young Men's Republican Club of Pierce County, by S. A. Perkins, Tacoma, candidate for republican national committeeman, and prominent newspaper owner. Mr. Perkins declared that if Tacoma had acquired its railways fifteen years ago "even paying five times the price they were worth, the city would be twice its size today," to say nothing of the benefits realized in avoiding the conflict at the city hall with the company during the past few years.

Four-Cent Wage Increase in Atlanta

An increase in wages just negotiated under a new contract between the Georgia Power Company and the Amalgamated Association, Atlanta, Ga., provides a wage of 50 cents an hour for the first nine months, 55 cents for the second nine months, 58 cents an hour thereafter, with a 7-cent differential for operators of one-man cars. This scale will continue until May 1, 1929, at which time a new schedule of wages will be drawn up.

The new scale is retroactive from Jan. 1, 1928. It means that motormen and conductors on two-man cars receive an increase of 4 cents an hour, and operators of one-man cars an increase of 3 cents an hour. All employees in the mechanical and roadway departments will receive an increase of 2 cents an hour.

Under the old scale motormen and conductors received 46 cents an hour for the first nine months of their employment, 51 cents an hour for the second nine months and 54 cents an hour thereafter. Since May 15, 1927, one-man operators have received 54 cents the first nine months, 59 cents the second nine months and 62 cents thereafter.

"The Public Servicer" to Appear Feb. 5

The Public Servicer is the name selected for the monthly employees magazine published by the St. Louis Public Service Company, St. Louis, Mo. It is the successor to the old *U. R. Bulletin* published by the defunct United Railways which ceased operations on Nov. 30, 1927. The first issue will be off the press on Feb. 5.

To secure a name for the new magazine the company offered cash prizes for the best title suggested. More than 350 replies were received. William Schwartz, an employee of the materials yards, won the first prize of $25. The second prize of $10 went to Edward Phelps, a company night watchman, who suggested *The Booster*. while Miss Marie Page, a daughter of a company conductor, won the third prize of $5. She suggested *Trolley Flashes*.

Higher Fares Don't Mean More Revenue, Los Angeles Hears

In a "memorandum" brought forth during the hearing on the application of the Pacific Electric Railway, Los Angeles, Cal., for higher fares, A. F. Mott, chief engineer of the California Railroad Commission, suggested three experiments on a limited scale and for a limited period of time in an effort to increase the revenue of the Pacific Electric Railway system.

First among these was the establishment of a Sunday and holiday pass, good within a radius of approximately 30 miles from Los Angeles, for unlimited use on any of the company's lines on the day for which it was sold—the price of this pass to be $1; second, the establishment of an off-peak low one-way rate in addition to the present established rate. The off-peak hours were given as between 9 a.m. and 4:30 p.m., and between 7 p.m. and midnight. A tryout might be made on the Venice-Santa Monica Lines; third, the establishment of a monthly pass good between Los Angeles and certain designated points, carrying with it the privilege of unrestricted use, not only on the interurban lines between the points for which sold, but also the privilege of unlimited local use within the primary zone of each terminal joint—the charge beeing about the charge for the present 60-ride commutation ticket.

Engineer Mott concluded by saying that the Pacific Electric should give "serious attention" to preventing the automobile from making further inroads on its business, and if possible, to win back to the fold patrons now using the automobile. He did not believe that fare increases were a means of increasing railway revenue.

The report contains figures of the effect of the Glendale experiment with lower fares. However, Mr. Mott admitted that the Glendale plan, although it had proved a "reasonable" individual success, did not absolutely prove that fare reductions of the same type would bring similar results over the remainder of the system. Fare reductions on the Glendale-Burbank line averaged 11 per cent.

"Riders That Do Not Count for 'More Revenue'"

The Virginia Electric Power Company, Richmond, Va., has reproduced a picture in the January *Vepcovian*, its house organ, showing the various coins passengers slip over for fares. They include a 2½-cent piece from Panama, a 2-cent piece from Mexico, a mutilated nickel, an aluminum slug, a 4-cent piece from Italy, a 2½-cent piece from Hungary, a brass campaign button and a brass drinking cup check.

Transit the Topic of the Hour in Philadelphia

A proposal for a new $50,000,000 transit development linking West Philadelphia, Pa., and Camden, N. J., by a high-speed line, was offered on Jan. 30 by Mayor Mackey of Philadelphia. This proposal was one of the features of an outline for the coming four years of his administration presented at a luncheon for the mayor and his directors by the Philadelphia Chamber of Commerce. His transit policies include, besides the link over the Delaware River Bridge, the Philadelphia Rapid Transit Company operation of the Broad Street subway beginning on Sept. 1 under a short-term agreement; Locust Street instead of Chestnut Street for subway; the Ridge Avenue-8th Street Loop, and the Randolph Boulevard for wide thoroughfare between Fifth and Sixth Streets as a bridge traffic feeder.

As an aid toward financing the proposed West Philadelphia-Camden high-speed line the Mayor said the Philadelphia Rapid Transit Company was willing to enter into an agreement prior to submission of the forthcoming $40,000,000 loan bill to the voters to pay interest and sinking-fund charges on that amount. He announced that the company had withdrawn its proposal that after it had by its payments, discharged the debt incurred for construction of an East-West subway, it should become owner. As outlined by Mr. Mackey, the city would retain permament ownership. With the company willing to pay $40,000,000 of the entire $50,000,000, the rest could be charged against earnings of the Delaware River Bridge.

On Jan. 27 Director Myers advised the Mayor that the recommendations of the Philadelphia Rapid Transit Company for changes in the City Hall Station and the underground walks of the South Broad Street unit of the subway were essential to adequate operation of the $100,000,000 line. His estimate of the city's outlay for the extensions was $6,000,000 and said that item, with Mr. Mackey's approval, would shortly be submitted to the City Council for inclusion in the April electorial loan.

He concurred in the suggestion of Ralph T. Senter, president of the Philadelphia Rapid Transit Company, that the city spend $250,000 for establishment of the feeder lines to the upper stretch of the subway, with the Philadelphia Rapid Transit Company making an outlay of $750,000.

Mr. Myers' report divided into five sections followed a conference with Thomas E. Mitten, chairman of the board of directors of the Philadelphia Rapid Transit Company, and a group of Eighth Street merchants, at which Mr. Mitten told them that the proposed Ridge Avenue extension of the Broad Street subway would be included in the plant worked out for operation of the city-built line. Another development was Mayor Mackey's announcement that the Broad Street subway would be ready for operation some time in August.

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Recent Bus Developments

Stringent Regulations in New York for Safety Sake

To insure the safety of passengers in public buses operated by carriers under certificates of convenience and necessity issued by the New York Public Service Commission, that body will require all bus operators before putting a bus conveyance in operation to submit a statement showing the type and character of buses used, type of heating equipment, form of notive power and type of brake equipment. Where a bus operator buys and operates a bus which has been in use before, the commission requires that it be notified of the mileage to date, the physical condition and other information which may be pertinent in the interest of safety.

Higher Tax on Connecticut Buses

The Connecticut Company, Hartford, Conn., has filed suit in the Superior Court to prevent the city of Hartford from taxing its 26 buses. In the petition it is claimed that the taxes paid on the buses in the State are in lieu of all other taxes to municipalities making the city's tax illegal. A plea in abatement and to the jurisdiction has been filed by the city in which it is alleged that the Connecticut Company has not appealed from the doings of the assessors to the board of relief, as provided in the statutes. The city moves for this reason to ask that the case be thrown out of court on the grounds that the Superior Court is without jurisdiction in the case at this particular stage.

The Connecticut Company states that since 1922 it has paid 3 per cent of its gross earnings within the State to the State, less certain deductions.

The city has assessed the buses for $95,000 and laid a tax of $2,011 on them as follows: $1,916 for city tax and $95 for school tax.

Expansion by Los Angeles Railway

Figures for 1927 show that the operations of the motor coach division of the Los Angeles Railway, Los Angeles, Cal., increased about one-third over 1926.

Two entirely new lines were added, Mines Avenue and Whittier Boulevard line and the Crescent Heights Boulevard line, 8.75 miles of new coach route. There were 2.43 miles of extensions, making a total of route mileage increase for year a little more than 11 miles and total miles of route 65.

Five double-deck and twenty single-deck coaches were added to the service, making a total of 119 after deducting old equipment.

None of the above figures includes the Los Angeles Railway's interest in the Los Angeles Motor Coach Company.

During 1927 the new repair shops, a building more than 300 ft. long, of the most modern design, was completed. A new service station was also completed for filling coaches with gasoline.

A modern washing system has been installed and is nearly completed.

Plans have been drawn for a new motor coach division headquarters.

Accounting Classification for Wisconsin

Motor carriers there divided into two classes under new accounting plan. Digest of provisions of code

A UNIFORM classification of accounts for motor carriers has been prescribed by the Railroad Commission of Wisconsin effective on Jan. 1, 1928. For the purpose of the classification motor carriers are divided into two classes, A and B. Class A companies are those with operating revenues that exceed $100,000. In Class B are companies with annual operating revenues exceeding $15,000, but not more than $100,000, or those jointly operated in connection with a Class A or B utility as heretofore defined by the commission and having a revenue of less than $15,000 annually.

A uniform system is prescribed for all classes of companies, for balance sheet accounts, fixed capital accounts, income accounts, profit and loss accounts, and operating revenue accounts. In the case of operating expense accounts two groupings are prescribed. Class A companies are to keep 39 accounts and the smaller companies only 21 accounts.

Under this classification depreciation charges are considered a part of the general and miscellaneous group, but in making up the standard form of income statement, depreciation must be shown separately along with uncollectible bills and taxes assignable to operations. In other words, depreciation and taxes are treated as income deductions. Rents are likewise treated.

The grouping of the revenue and expense accounts follows closely the classification adopted by the National Association of Railroad & Utilities Commissioners and the American Electric Railway Accountants' Association. Mention should be made of the group entitled "garage operating expenses" which covers fuel, lubricants, garage employees, and garage supplies and expenses. Operating expenses lead off with the group of maintenance accounts, followed by garage operating expenses, transportation, traffic and general and miscellaneous. The revenue accounts correspond with those prescribed in other standard classifications both as to individual accounts and arrangement.

The arrangement of the balance sheet is new. Fixed capital accounts follow the arrangement of the standard classification except with regard to the method of handling "cost of property and equipment purchased," which is carried as a suspense account until such time as the cost is assignable to fixed capital accounts. Provision is also made for fixed capital accounts maintained prior to the time the new classification is put into effect.

Houston Line Will Be Continued

Because of protests from residents of Bellaire, Tex., the Houston Electric Company has decided to abandon its plan for withdrawing bus service from that territory. Plans to discontinue the service were based on insufficient returns and heavy expenses. The bus is operated by the Houston Electric Company through a contract with the Westmoreland Farms Company, which in turn had an agreement with Bellaire property owners.

Court Acts in Seattle-Tacoma Case

Differences between E. Krakenberger of Tacoma, Wash., and the Pacific Northwest Traction Company, a subsidiary of Puget Sound Power & Light Company, Seattle, Wash., over their respective rights to provide bus service have been carried into the State Department of Public Works and the Thurston County Superior Court.

Mr. Krakenberger has been granted permission by the Department to provide motor passenger and express service over the new Pacific Highway between Seattle and Everett. Similar permission was refused the electric interurban between Seattle and Everett, and Seattle and Tacoma. As a result, the railway secured from the Thurston County Superior Court a writ of review which takes precedence over the Department of Public Works' order denying the company's permission to operate stage service over the new highway. In granting the petition for review, Superior Judge John M. Wilson issued an order restraining Mr. Krakenberger from operating on the new route until litigation is closed. Mr. Krakenberger has also announced his intention of invading a new field and has applied for permission to give motor bus service on the new highway between Seattle and Tacoma.

Substitution on New Jersey Line

Permission has been granted to the Public Service Railway to discontinue railway service on its Broadway route south of Gloucester City, N. J., and the Public Service Transportation Company, its subsidiary, has been authorized by the commission to substitute bus service for trolleys between Camden and National Park and Woodbury and Blackwood.

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Steam Railroad Secures Charter for Subsidiaries

Governor Fisher of Pennsylvania signed the charter of the Reading Transportation Company on Jan. 27. Stock control in the company is held by the Reading Company, which will own 1,965 of the 2,000 shares of common stock. Officers of the Reading Company are incorporators of the subsidiary. Previous approval had been obtained from the Public Service Commission before the Governor acted. The commission in its decision held that the Reading must secure sanctions for each separate bus route it plans to establish.

During the hearings before the Publis Service Commission the Schuylkill Railway and its bus subsidiary appeared as protestants. This company operates electric railways out of Pottsville, Pa., and vicinity. It contended that the Reading planned to invade its territory. After it had been overruled by the commission the electric railway appealed to the Superior Court. The case was dismissed. The Supreme Court then denied an appeal from the Superior Court decision. The steam railroad must still prove to the satisfaction of the Public Service Commission that public necessity and convenience require any service it may contemplate installing, so recourse is still open to the electric railway to protest any plans by the steam carrier for installing service which the electric railway might regard as competitive or unwarranted.

The first effort on the part of the Reading to get its subsidiary chartered in Pennsylvania was unsuccessful. Shortly before leaving office more than a year ago Gifford Pinchot, then Governor, declined to approve the charter. At that time the Pennsylvania Railroad had an application pending to organize a bus subsidiary with a capital stock of $500,000. Mr. Pinchot refused to approve the incorporation of both companies. The Pennsylvania Railroad was asking the right to run buses for freight and passenger service in 55 of the state's 67 counties.

Buses in Savannah Accommodate Steam Railroad Employees

A bus service to transport employees of the Atlantic Coast Line Railroad shuttle train operating between the yards on East Broad Street, and the shops at Southover Junction, Savannah, has been arranged with the Savannah Electric & Power Company. The new service is a substitution for the shuttle train discontinued. The contract made with the Savannah Electric & Power Company was let after bids had been received from a number of concerns.

The Savannah Electric & Power Company secured buses in this service. These are of the latest standard city car type, one having a seating capacity of 29 passengers, and the other 21 passengers. The larger bus is operated during the daylight hours, and the smaller bus during the night hours. The buses handle only employees of the Atlantic Coast Line Railroad. Due to the many employees at the shops one shuttle train will be operated in each direction in the morning and afternoon.

Several months ago the railroad announced that it had determined to withdraw the shuttle train as soon as definite arrangements could be made for the operation of a substitute service.

Extension of Bus Service in Jacksonville

Bus service to the residents of Murray Hill is to be given by the Jacksonville Traction Company, Jacksonville, Fla. Two buses will be used for the new line. This proposed service was referred to previously in ELECTRIC RAILWAY JOURNAL.

Bus Purchase in Ohio

The Cleveland-Akron-Canton Bus Company, a subsidiary of the Northern Ohio Power & Light Company, Akron, Ohio, has purchased the Blue Line Transit Company operating between Canton and Dover, Ohio. Equipment valued at approximately $25,000 is included in the deal.

New Schedule on Missouri Interurban

A new schedule which will cut down the number of buses operating between Excelsior Springs and Kansas City, Mo., is to be put into effect by the Kansas City, Clay County & St. Joseph Railway and bus companies. Under this plan Excelsior Springs will have hourly service to the city alternating between buses and the interurban line.

More Bus Feeders in Chicago

The Illinois Commerce Commission has ordered the Chicago Surface Lines to establish bus feeder service on Diversey Avenue from Milwaukee west to the city limits, and on Belmont from Central Avenue to the city limits.

The Surface Lines now operates a feeder bus line on Diversey Avenue from Crawford to Laramie, and the new order would extend this service east and west, connecting it with one of the important diagonal street car lines to the northwest.

A 7-cent fare is charged and transfers are granted between buses and street cars.

No action has been taken by the commission on the petition of 40,000 residents on Addison Street to have a feeder bus service established by the Surface Lines along that street.

During the week ended Jan. 28 Mayor William Hale Thompson vetoed the City Council's authorization of the establishment of this bus service on Addison Street.

Buses on First Street, San Diego

Buses are to be used by the San Diego Electric Railway, San Diego, Cal., to replace cars on the company's First Street line. Under the bus plans a 10-minute headway will be maintained between 6 a.m. and 7 p.m. as compared with 15 minutes headway on street cars. The line will operate as a unit of the railway system, with transfer privileges to every other line. G. E. Mason, general manager of the railway, is reported to have said:

The tracks and paving on First Street have been in poor condition for some time and, until recently, we had expected to replace the tracks and continue railway operation because of the large volume of passengers being handled on this line.

The standard type of bus was not considered suitable for this line. However, due to recent developments, a new aspect has occurred in transportation views and new possibilities have been opened up in bus operation through the adaption of larger capacity vehicles. After considerable investigation and actual operation of the newly-developed bus on our own property we have been convinced that this service will prove practical for use on the First Street line.

The bus is known as the twin coach. In appearance it is similar to a street car. It has a seating capacity of 40 passengers and is provided with front and rear large doors so passengers can get on and off with a minimum of delay, as contrasted with the use of the small single door on the average bus. It is driven by two engines, both underneath the floor and in the center of each side. Thus the whole street space occupied by the bus is utilized for passenger carrying and is much more efficient and causes much less congestion than the older types of buses with their large projecting hoods and fenders.

We believe the residents along the First Street line will welcome the change from street cars to this new and delightful type of equipment drawing up to the curb, as it does, to receive and discharge its passengers and for the further fact that, under bus operation, we will be able to provide much closer headway, that is, much more frequent service because of the flexibility of the new equipment.

Another Way to Relieve Traffic in South Bend

Permission to operate a supplemental motor freight service within South Bend was granted the Chicago, South Shore & South Bend Railroad by the Indiana Public Service Commission. Freight now is transferred between two freight terminals of the road by freight cars, and the institution of a motor truck and trailer service will help to relieve congested traffic conditions.

Bus Extension in Quincy

The Quincy Street Railway, Quincy, Ill., is preparing to supplant its present North Fifth Street line with buses on the completion of the repaving of that district. Five additional buses are included in the 1928 budget of the company anticipating and providing for this extension of the motor service, making a total of 20 buses in operation in the city.

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Financial and Corporate

New Jersey Details Arranged

Public Service Co-ordinated Transport begins to function as consolidation of railway and bus companies

PUBLIC Service Co-ordinated Transport—a new company formed by the consolidation of Public Service Railway and Public Service Transportation Company, Newark, N. J.—was created on Jan. 31 when the certificate of organization was filed with the Secretary of State at Trenton. Earlier in the day the stockholders of the two companies adopted the agreement of merger, submitted to them by the directors of both companies.

The main purpose of the consolidation is the co-ordination into one operating unit of the two companies which have heretofore operated the railways and buses. Instead of dividing the responsibility between two companies, the one company will hereafter operate both services, with the object of effecting greater economies and efficiency, redounding to the advantage of the public as well as to the stock and bondholders.

The consolidation will also bring an improvement in financial structure, including the possibility of an open-end mortgage making it easier to secure new capital for extension and betterment of facilities. As Thomas N. McCarter, president, pointed out when the first announcement of the proposed merger was made, the benefits of this character of consolidation have been demonstrated in the merger of the electric and gas companies into Public Service Electric & Gas Company in 1924.

The certificate of organization specifically states that the new corporation "shall have and possess, and may use, exercise and enjoy all the rights, powers, privileges and franchises of the said corporations, parties to this agreement."

Furthermore, that: "All and singular, the rights, privileges, powers, stock, property, whether real, personal or mixed, railways and franchises of each of the parties thereto, shall vest in the co-ordinated corporation immediately upon the adoption of this agreement by the stockholders of the said corporations, according to law, and the filing of this certificate, or a copy thereof, with the secretary of state."

It is also provided that the new corporation "may issue its stock, common and preferred, may make, issue and dispose of bonds or other obligations in order to carry out the purposes of the consolidation; to pay and discharge bonds, mortgages and encumbrances upon any of the property of the consolidated companies."

The financial procedure involved in the consolidation is, briefly, as follows:

Provision is made for the issuing of 2,500,000 shares of no par value common stock and 487,500 shares of non-cumulative preferred stock of no par value. Preferred stock will have no voting rights but will receive dividends at the rate of $6 per annum per share, for such years as in the judgment of the board of directors such dividend is justified and before dividends are paid on common stock. In the event of the dissolution of the company its preferred stock shall be entiled to a division of the assets at the rate of $75 a share, before the common stock receives any part of the assets.

Under the terms of the agreement the 487,500 shares of no par value common stock of Public Service Railway outstanding will be exchanged for 487,500 shares of non-cumulative preferred stock of Public Service Co-ordinated Transport, and the 1,004,500 shares of common stock of Public Service Transportation Company outstanding for the same number of shares of common stock of the company.

Directors and officers of the new corporation follow: Directors, Thomas N. McCarter, Samuel T. Bodine, Thomas S. Gates, Anthony R. Kuser, Alfred L. Loomis, Uzal H. McCarter, Arthur W. Thompson, Landon K. Thorne, Edmund W. Wakelee and Percy S. Young.

Officers, Thomas N. McCarter, president; Percy S. Young, Edmund W. Wakelee, John L. O'Toole, George Barker, Matthew R. Boylan, vice-presidents; Charles M. Breder, secretary; William H. Feller and William T. Crudge, assistant secretaries; T. W. Van Middlesworth, treasurer; Frederick A. Neis, Robert S. Tomkins and F. Milton Ludlow, assistant treasurers.

These men have occupied similar positions with the two merged companies.

Grand Rapids Gross Increases

Economy and modernization methods of Grand Rapids Railroad result in reasonably satisfactory position for 1927 operation

THE number of revenue passengers carried on the lines of the Grand Rapids Railroad, Grand Rapids, Mich., during 1927 decreased 5.96 per cent below 1926. Gross earnings naturally were affected and decreased $95,595, compared with those of the preceding year. These decreases were due principally to an unexpected slowing down of manufacturing activities in the city's largest industry, namely, furniture making. This condition operated to the detriment of street car patronage but owing to the steps taken by the management in installing a new type of car on various lines, the savings realized from lower operating costs more than offset the decline in gross earnings. As a result, gross income after operating expenses and taxes for the year 1927 showed an increase of $20,262 over 1926. This was part of the story of the year's operation as disclosed in the report to the stockholders for the eight months ended Dec. 31, 1927. The board of directors submitted the eight months' statement and one for the calendar years 1926 and 1927, of which 1926 and the first four months of 1927 cover operations by the predecessor.

In accordance with the plan of reorganization of the Grand Rapids Railway dated April 11, 1927, the present company was incorporated under the laws of Michigan on April 15, 1927, and as of May 1, 1927, acquired all of the assets and assumed all of the indebtedness of the former company, including its outstanding bonds. A total of $146,800 in par value of 7 per cent preferred stock (out of an authorization of $300,000) and all authorized common stock consisting of 100,000 shares without par value were issued. The outstanding debenture bonds were reduced by $355,000 and the entire

GRAND RAPIDS STATEMENT FROM MAY 1, 1927, TO DEC. 31, 1927

Gross Earnings:	
Passenger revenue	$1,034,243
Revenue from special cars	1,477
Rent of equipment and tracks	34,322
Non-operating revenue	1,637
Total	$1,071,679
Operating expenses and taxes:	
Operating expenses	657,416
Taxes	81,487
Total	$738,903
Gross income available for fixed charges, dividends and retirements	332,776
Interest on funded debt	162,957
Interest on unfunded debt	7,344
Total	$170,301
Net income	162,474
Dividends on preferred stock	6,841
Provision for retirements	81,105
Balance	$74,529
Ratio of operating expenses to gross earnings	61.34
Ratio of operating expenses and taxes to gross earnings	68.95
Revenue passengers carried	11,665,803

STATEMENT OF EARNINGS OF GRAND RAPIDS RAILROAD

	Year 1927	Year 1926
Gross earnings:		
Passenger revenue	$1,627,157	$1,724,395
Revenue from special cars	1,893	3,480
Rent of equipment and tracks	44,375	38,035
Non-operating revenue	1,925	5,036
Total	$1,675,351	$1,770,947
Operating expenses and taxes:		
Operating expenses	$1,005,642	$1,108,709
Taxes	133,495	146,287
Total	$1,139,138	$1,254,996
Gross income available for fixed charges, dividends and retirements	$536,213	$515,950
Ratio of operating expenses to gross earnings	60.03	62.60
Ratio of operating expenses and taxes to gross earnings	67.99	70.87
Revenue passengers carried	18,378,036	19,542,920

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floating indebtedness aggregating $606,333 was provided for. In addition to the cash realized as a result of the plan, $200,000 in principal amount of first mortgage sinking fund 7 per cent bonds due May 1, 1939, were sold, so that the net reduction in the total bonded debt was $155,000.

An initial quarterly dividend of 1¾ per cent was paid on the 7 per cent preferred stock (all of which was subscribed for by preferred stockholders of the old company) on Aug. 1, 1927, and quarterly dividend No. 2 was paid on Nov. 1, 1927.

No change was made in the rates of fare in effect during 1927, namely, 10 cents single cash fare, and six tickets for 50 cents. According to the terms of the franchise, the company is entitled to earn at these rates a return of 7¾ per cent on the value of the property after deduction of operating expenses, taxes and provision for retirement reserve.

A total of $95,303 was expended during 1927 for additions and betterments. The larger portion of these expenditures was for the purchase of 10 second-hand Birney single-truck, one-man operated safety cars and remodeling them in conformity with the standard Grand Rapids type of cars.

Bus service is rendered as supplemental to and in co-ordination with that rendered the public by the street railway system. It is intended to extend bus service to territory not now served by street cars, whenever conditions so justify.

Steps taken in conjunction with other organizations in the city to promote public safety work bore favorable results in 1927. The expenditures for injuries and damages in 1927 amounted to only 1.11 per cent of the transportation revenue. The continued use of loading platforms and safety zones has been beneficial and together with the safety campaign conducted has reduced the number of avoidable accidents between automobiles and street cars.

Mention is made in the report of the distinction conferred upon the company by the Charles A. Coffin Award for the year 1927.

Would Lease Three Illinois Electric Railways

The Illinois Terminal Corporation applied to the Interstate Commerce Commission on Feb. 2 for permission to take long-term leases on three electric lines in that state. It proposes to operate the St. Louis, Troy & Eastern, the St. Louis Electric Terminal Railway and part of the main line of the Illinois Traction, Inc. The first two corporations control much shorter roads than Illinois Traction. Increased efficiency in operation and elimination of duplication in service and terminals were said to be the reasons for the proposed consolidation. All of the leases would run for 99 years with rental rates based on the amount of property involved.

Receivership Ahead in Tacoma

Petition expected to be filed with court soon. Scott Z. Henderson suggested for place

PETITION for a receiver is expected to be filed in the federal court in Tacoma early in February by bondholders of the Tacoma Railway & Power Company, Tacoma, Wash. Representatives of the creditors met on Jan. 24 in New York, with Mayor Tennant and Scott Henderson attending, and unanimously decided to apply for receivership. This action has not been unexpected, as negotiations between the City Council and railway officials had come to a point where it seemed a revaluation of the railway properties was inevitable. The company management had been asked to determine whether the bondholders and stockholders would agree to a valuation of $3,000,000 for rate-making purposes instead of the $6,700,000 approximately allowed by the state.

Puget Sound Railway Also Involved

Moreover, the fact that the Tacoma companies defaulted in their last interest payments on bonds and may do so again this spring indicated probable receivership. The Puget Sound Electric Railway, which by ownership of $600,000 of common stock of the Tacoma Railway & Power Company is the controlling interest, also is reported in financial straits. That company has announced that it will no longer advance sums to meet interest payments for the Tacoma company. The Puget Sound Electric Company, operating an interurban line between Tacoma and Seattle, is in turn a subsidiary of the Puget Sound Power & Light Company, under Stone & Webster direction.

Statement in Behalf of Company

Meanwhile, Richard T. Sullivan, manager of the company at Tacoma, in a bulletin to all employees indicates that he expects little if any change in the operation of the lines, and declares there will be no interruption of the orderly operation of the transportation system. The schedule of fares now in effect has been authorized by the State Department of Public Works until the last of May.

Mayor Tennant, in a telegram from New York to the Council, looks upon the receivership as a means of obtaining an orderly settlement of the Tacoma transportation problem. His telegram is as follows:

> In meeting with a committee representing the creditors of the Tacoma Railway & Power Company at the Pennsylvania Hotel, New York, it was decided that in the best interests of all parties concerned an immediate receivership of the company should be petitioned for under federal court jurisdiction.
>
> It was also unanimously agreed to recommend to the court at the proper time that Attorney Scott Z. Henderson be appointed as receiver.
>
> In my opinion, with the hearty co-operation which I am sure the citizens of Tacoma are ready to give the course outlined, this offers a prompt and orderly solution of our entanglements which have hampered and embarrassed us in the past.
>
> Therefore, I am authorized to inform the citizens of Tacoma of this contemplated act.

Lynchburg and Roanoke Properties Sold

Confusion caused by newspaper announcements is cleared up by an official statement from George N. Tidd, president of the American Gas & Electric Company, that, while retaining the electric light and power business in Roanoke and Lynchburg, Va., and the Lynchburg gas plant, which have for some time been operated by the Appalachian Electric Power Company, the American Gas & Electric has sold the Roanoke Railway & Electric Company, the Roanoke Traction & Light Company and the Lynchburg Traction & Light Company, operating electric railway lines and bus lines.

The new owners are the Central Public Service Company, Chicago, which also recently purchased the Rockford Electric Company and railway and bus lines in Wildwood, N. J., Huntington, W. Va., Ashland, Ky., Portsmouth, Ohio, and Ironton, Ohio, from the American Gas & Electric Company.

Franchise of Pennsylvania Property to Be Sold

The corporate franchise of the Pennsylvania & Maryland Street Railway, operating from Salisbury to Meyersdale, a distance of 7 miles, will be offered for public sale through Receiver H. S. Wilhelm, at the courthouse in Seneca, Pa., on Feb. 4. This is in pursuance of the decree of the Court of Common Pleas. The sale is for the purpose of divesting a mortgage given by the railway to the Farmer's Loan & Trust Company, New York.

In 1924 the company abandoned the 5-mile line between Meyersdale and Garrett, Pa. Some months ago the franchise became the property of the Associated Gas & Electric Company by virtue of the acquisition of the Meyersdale Electric Light Company of Meyersdale.

Baltimore Easements Valued at $5,000,000

A valuation of $5,000,000 was placed upon the easements of the United Railways & Electric Company, Baltimore, Md., by the Maryland Public Service Commission on Feb. 1. The previous figure fixed by the commission was $7,000,000. The latest decision, therefore, finds the total value of all property of the company, including easements, to be $75,000,000 as of Dec. 31, 1923.

An order was passed by the commission stating that the fair value for rate-making purposes of the United property on Dec. 31, 1923, was $75,000,000 and this valuation shall become final

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unless protest is filed within ten days. The remainder of the order passed by the commission on March 9, 1926, is unchanged.

The controversy over the value of the easements came up in 1926 when the commission fixed the valuation at $7,000,000. At that time the United claimed a value of $18,184,954. Clarence W. Miles, then People's Counsel, contended that no value whatever should be placed on the easements. When the $7,000,000 value was placed he appealed to the courts and the commission was upheld in a decision handed down by the Circuit Court of Baltimore City. Mr. Miles then carried the case to the Court of Appeals of Maryland. The appeal resulted in the court handing down a decision sustaining the principle of allowing a value for easements but holding that in using assessment values for fixing the value of the easements the commission actually had used values which contained the element of earning power. The court remanded the case, without affirmance or reversal of the decree, for further proceedings. An agreement followed by which the case was returned to the commission for rehearing. This latest action then followed.

Would Abandon Ohio Line

The Northern Ohio Power & Light Company, Akron, Ohio, has applied to the Ohio Public Utilities Commission for the permission to abandon its line and remove its tracks between Canton and North Canton, a distance of 6 miles. It has also filed application for abandonment of service between North Canton and Akron. Hearing has been set for March 13. The Cleveland-Akron-Canton Bus Company, a subsidiary of the Northern Ohio Power & Light Company, is now operating buses over the highway between Akron and Canton.

Seven reasons are named in the application to the commission. They are:

1. Operation of the line has been unprofitable for several years, and losses are increasing.
2. The Akron-Canton highway is to be paved to nearly its full width, necessitating removal of the tracks.
3. The company has been requested by the Commissioners of Stark County to get off of the highway.
4. The County Commissioners and the company have been unable to agree on new franchise terms.
5. All franchises for the operation of the line have expired.
6. Other transportation along the route is adequate, and maintenance of the line is not needed for the public's necessity and convenience.
7. Facilities for hauling freight between the two cities have been arranged.

Removal of this branch of the company's interurban line will not affect service on any other part of the system. For many years the company has maintained an hourly schedule between Akron and Canton. The Akron-Canton line has been operating for approximately 25 years.

Surplus in Cleveland Subject to Tax

Decision rendered by United States Board of Tax Appeals will be carried to courts

Surplus earnings of a public utility, though accumulated for the sole purpose of making possible a reduction in rates, are subject to federal income and excess profits taxes. The United States Board of Tax Appeals has so ruled in a case appealed by the Cleveland Railway. By a twelve to four decision, the board held that the railway must pay $470,000 additional taxes for the years 1918 to 1921 inclusive.

An appeal will be taken to the United States Circuit Court of Appeals, according to Joseph H. Alexander, president of the company. The law department of the city of Cleveland, which joined in the hearing before the tax appeal board, will join in the appeal to the courts. The case may reach the United States Supreme Court on constitutional questions.

The dispute arose from the unusual provisions of the Tayler franchise, under which the Cleveland Railway operates. Under the terms of this franchise stockholders are guaranteed a 6 per cent return and surplus earnings above the amount needed to meet this charge are used to provide a barometer fund under which fares are varied in accordance with the amount in the fund. Thus when the fund goes below $500,000 the fare automatically goes up, and when the fund goes above $1,100,000 the fare automatically goes down.

The company contended that the money put into the interest fund was not subject to taxation, because the car-riders of the city, upon whom the burden ultimately falls, are in fact a political subdivision under the meaning of the revenue law and therefore entitled to relief from that burden.

The majority opinion of the board, written by Chairman Benjamin H. Littleton, stated that while it is undoubtedly true that the levying of the tax in question will impose a burden upon the petitioner, which in turn will mean a burden to the car-riders, this is not a burden upon a political subdivision within the meaning of the law. The opinion said:

> The burden is not on the city of Cleveland as such. No income is derived by it from the operations of the petitioner, nor is it required to pay any of the petitioner's expenses, be they taxes or otherwise. The car-riders of the city of Cleveland and its suburbs are in no sense a political subdivision, but are merely members of a community, or of several communities, which use the transportation facilities of the petitioner. The burden would indirectly fall upon them in their individual capacities, but not upon a political unit or subdivision in its sovereign or governmental capacity.
>
> To carry the petitioner's argument to its logical conclusion would mean to exempt the petitioner from all tax, since to levy any tax on this corporation would be to increase the cost of transportation, which in turn means increased car fares and, therefore, imposes a burden on the community of car-riders to that extent.

A dissenting opinion was prepared by Examiner William R. Green, Jr., before whom the original arguments in the case were submitted. Mr. Green pointed out that receipts accumulating in the interest fund are not subject to the will of the corporation, that they may not be distributed and that their use is limited by provisions of the Tayler franchise. He added:

> In them the petitioner has nothing definite, nothing tangible, nothing usable in the way of income. Their accumulation is a matter of no interest to the petitioner because no advantage is gained thereby. No gain or profit results from such an accumulation and it lacks several of the essentials of true income under the sixteenth amendment.

City's Engineers Fix St. Paul Value at $14,865,180

Averaging three separate and varying findings by three civil engineers employed by the City of St. Paul, Minn., it is estimated by Corporation Counsel A. A. Stewart that the present value of the St. Paul City Railway is $14,865,180, with 20 per cent depreciation. This is to be the contention by the city in the forthcoming hearing of the railway before the Minnesota Railroad and Warehouse Commission for an increase in fare. The company's own estimate is $16,503,557. The commission's valuation finding four years ago on an 87 per cent basis was $16,196,090.

Each engineer presented two sets of figures—one the depreciated condition of the property without allowance for any except physical wear, the other making some allowance for obsolesence for track where changes in street structure will require its removal.

To the report of the engineers was added three additional items set up by the commission: $1,000,000 going concern value, $100,000 working capital and $870,513 land values. Mr. Stewart said:

> These figures will of course be disputed by the company's engineers, but assuming that they are adopted by the commission a 7 per cent return would require that the company earn over and above its operating expenses $1,500,000 a year. The company last year fell short of this more than $300,000. It earned not quite 5 per cent on a $15,000,000 value.
>
> If the relief suggested in the charter amendment is granted the earnings of the company would be approximately 6 per cent on $15,000,000. The earnings of the Minneapolis company amount to approximately 7 per cent on the commission's value without any additional depreciation since 1924.
>
> Even if the commission should adopt the city's present contention as to the depreciation value of the property it will be necessary to grant the relief proposed by the charter amendment in order to bring the earning capacity of the St. Paul company up near the earning capacity of the Minneapolis company.

The city engineer experts are W. L. Darling, formerly chief engineer Northern Pacific Railroad; Max Toltz and L. P. Woolf.

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Legal Notes

IOWA—*City Not Responsible to Street Railway for Expenses in Change of Grade.*

A statute in Iowa says that when any city or town changes the grade of any street, so as to injure the value of any improvement made by any person on the street, according to the previously established grade, the city shall pay to the owner of the property so injured the amount of the damages inflicted. This was held not to cover a street railway on the street, which was obliged itself to defray the cost of the necessary alterations to its double track on a street whose grade was changed by the city. [Des Moines City Railway vs. City of Des Moines, 216 N.W., 285.]

MASSACHUSETTS.—*Boston Elevated Bill Declared Constitutional.*

In two opinions the Supreme Judicial Court answered eleven questions propounded by the State Senate and 24 questions by the House of Representatives relating to the constitutionality of a bill extending the lease to the Commonwealth of the properties of the Boston Elevated Railway and continuing public management and operation. An extended abstract of these opinions was published on page 998 of the issue of ELECTRIC RAILWAY JOURNAL for Nov. 26, 1927. [In re opinion of the Justices, 159 N.E., 55 and 70.]

MISSOURI — *Court Defines Care Required of Automobilists at Railroad Crossings.*

In a crossing accident, even where the steam railroad train did not give the statutory signals, the railway may offer contributory negligence as a defense to show that the failure to give the signals did not cause the injury. A railroad is a signal of danger, and if to look or listen will enable one approaching a railroad track to see or hear an approaching train, failure to look or listen is negligence as a matter of law. An automobilist in approaching a crossing should operate his car at such a rate of speed that he can readily stop after reaching a point where he can see an oncoming train and before coming within the danger zone. If objects obstruct his view or noise interferes with his hearing, his conduct must meet these conditions. Otherwise he is negligent. [Maclay vs. M. P. Ry., 299 S. W., 626.]

NEW HAMPSHIRE—*No Warning Necessary to Passenger Leaving Moving Car.*

The conductor on an open car is under no duty to warn a passenger leaving it before it stops of possible irregularity of movement in stopping, since passengers are assumed to have general knowledge of the danger of leaving a moving car. Where a passenger knows the danger of the situation and is able to avoid it, the carrier is not held to so high a standard of care as that which it must use to protect passengers from dangers of which they are ignorant and cannot themselves avoid. [Wright vs. B. & M. R.R., 139 A., 370.]

NEW JERSEY—*Passenger Injured While Closing a Broken Window.*

A passenger was injured by being cut by glass falling from the window when he was attempting to close it. The glass in the window was cracked before the attempt was made. The court held that he was not contributorily negligent *per se* in not calling the motorman of the one-man car to close the window, even though he had already observed that the window glass was cracked. [Russell vs. P. S. R. Co., 139 A., 322.]

NEW YORK—*City Requiring Relocation of Poles for Construction of Its Railroad Must Compensate Electric Company.*

In the construction of an elevated portion of the New York Rapid Transit System, the City of New York acted in a proprietory and not in a governmental capacity. Hence, it was required to compensate an electric company for the expense to which it went in removing and relocating its poles and lines caused solely because they would interfere with the construction and operation of the railroad. Such poles and lines constituted property of which the electric company could not be deprived without just compensation. If the removal and relocation had been necessitated by a regrading of the street or any other purpose necessary for the usual use of the street by the public for public street purposes, the cost of the change would have had to have been borne by the electric company. [N. Y. & Q. E. L. & P. Co. vs. City of New York, 224, N. Y. Sup., 564.]

OHIO—*Certificate for Extension of Bus Line Should Not Be Allowed Where the Extension Overlaps an Existing Route.*

Two bus companies operating in uncompeting territories petitioned for extensions. These extensions, if granted, would overlap each other and one would overlap part of the existing line of the other. The Supreme Court of Ohio held that where each applicant was prepared to meet all the requirements essential in a proposed service the opinion of the Commission should be accepted as to the one to be the grantee. However, it notified the Commission to shorten the extension requested by the grantee so that it would not overlap the existing line of the other company. [Cooper Bus Co. vs. P. U. Commission of Ohio, 158, N.E., 543.]

PENNSYLVANIA — *Responsibility for Defective Paving Placed.*

Even in the absence of a contract, a street railway company is under the implied duty to keep in proper repair the portions of a highway occupied by its tracks. A person injured because of a defect in this paving may sue either the municipality or the street railway company. If he chooses the latter, the one ultimately liable, and fails to recover, he cannot later sue the municipality for the identical negligence. [Brobston vs. Borough of Darby, 138 At., 849.]

TEXAS — *Damages to Property From the Construction and Operation of Railway.*

Damages for depreciation of the value of a homestead, caused by the construction and operation of a railroad in close proximity to it, not common to the public generally, are recoverable. This principle, long recognized by the Texas courts, was held to apply to property in close proximity to a trestle built by an interurban railway, as it was claimed that the value of the property was depreciated by the noise and vibration caused by passing trains. [Texas Interurban Ry. vs. Halford, 299 S.W., 277.]

WEST VIRGINIA — *Court May Award Certificate to Motor Carrier Without Referring Cases Back to Commission.*

Two independent motor carriers applied for certificates of convenience and necessity between certain points. One of these applications was opposed by an electric railway company serving the same general territory which offered to install a bus extension to give the same service. The other certificate was similarly opposed by an existing steam railroad, offering through its bus subsidiary to give the service proposed between those two cities. Award of certificates by the State Railroad Commission to the independent bus companies was set aside by the Court in favor of the subsidiaries of the steam and electric railroads on the ground that the public policy of the state, as expressed in legislative enactments, requires that public utilities be given reasonable protection from detrimental competition. Therefore, when an existing carrier is one of several applicants for the initial permit to operate motor buses over a highway between points served by its lines, and it is fully qualified to render the additional service proposed, the State Road Commission should ordinarily give preference to the carrier. Priority of time and application, while an element to be considered, is not ordinarily of sufficient importance to control the granting of a certificate. [Monongahela W.P. P. S. Co. et al. vs. State Road Commission et al., also B. & O. R.R. et al. vs. same, 139 S.E., 744 (two cases).]

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Personal Items

F. J. Foote President C.E.R.M.M.A.

F. J. Foote, recently elected president of the Central Electric Railway Master Mechanics' Association, is superintendent of power and equipment of the Indiana, Columbus & Eastern Traction Company, Springfield, Ohio. In his present capacity he is responsible for the maintenance of the cars, shops and substations of that company, and the buses of the Dayton & Columbus Transportation Company, which is affiliated with the electric railway.

Mr. Foote has been identified with the property that centers in the city of Springfield since 1909. Previous to his affiliation with the company, then known as the Ohio Electric Railway, he was employed as electrical engineer by the Allis-Chalmers Company, Milwaukee, Wis., and the Westinghouse Electric & Manufacturing Company, Pittsburgh, Pa.

F. J. Foote

Mr. Foote is a graduate of the University of Illinois and did post-graduate work at the University of Wisconsin. In the latter institution the degree of electrical engineer was conferred on him in 1902.

The association of which he has recently been elected president is composed of the mechanical department officers or the men responsible for maintenance of rolling stock and shops of the various companies who are members of the Central Electric Railway Association. He was one of a small group of men who organized the association of which he is now the head.

P. J. Raver Goes to University

Paul J. Raver, estimating engineer for the Chicago Surface Lines, Chicago, Ill., has joined the staff of the Institute for Research in Land Economics and Public Utilities of Northwestern University, Evanston, Ill. This was announced by Dr. Richard T. Ely, director of the institute. Mr. Raver also becomes a lecturer in the public utility courses in the school of commerce of Northwestern.

Mr. Raver's practical experience began in the engineering, accounting, and transportation departments of the Lincoln Traction Company, Lincoln, Neb. During the valuation of that property in 1919, he joined the staff of Hagenah & Erickson, engineers and appraisers in Chicago, where he was in charge of the valuation of the Central Illinois Light Company of Peoria, the Central Illinois Public Service Company properties and other public utilities. In 1922, he was made engineer of estimates for the Chicago Surface Lines.

The school of commerce of Northwestern University granted him the degree of master of business administration in June, 1927, for graduate studies carried on during the preceding three years. Mr. Raver obtained his bachelor's degree in engineering at the University of Nebraska in 1917.

E. C. Bassett Appointed General Passenger Agent at Buffalo

Earl C. Bassett, traveling passenger agent has been appointed general passenger agent for the International Railway and International Bus Corporation, Buffalo, N. Y. Mr. Bassett succeeds J. E. Wilmot, recently promoted to passenger traffic manager.

Mr. Bassett was engaged in railroad work with the Erie Railroad before going to Buffalo.

J. K. Choate Resigns from J. G. White Management

Joseph K. Choate has resigned as director and vice-president of the J. G. White Management Corporation, New York, effective March 31.

N. E. Drexler Succeeds C. D. Porter at Newport News

Norman E. Drexler has been named acting manager of the Newport News & Hampton Railway, Gas & Electric Company, Newport News, Va., succeeding C. D. Porter, who resigned as vice-president and general manager to accept a similar position with the Omaha & Council Bluffs Street Railway, Omaha, Neb. Mr. Drexler has been manager of the gas and electric departments of the company since 1925.

Since Mr. Drexler's graduation from college he has been with the Newport News & Hampton Railway, Gas & Electric Company. He served as assistant engineer, master mechanic, assistant chief engineer and assistant superintendent of transportation. In 1916 he was acting chief engineer of the Baltimore & Annapolis Short Line Railway and after that became chief engineer of the Newport News & Hampton Railway, Gas & Electric Company.

Mr. Drexler's construction activities included the tracks, bridges and overhead of the Hampton & Langley Field Railway and the Hilton extension of the Newport News & Hampton Railway. Mr. Drexler was born in Green Island, N. Y., in 1891. He was educated in the grammar schools of Troy and at the Troy Academy. He received the degree of C.E. from the Rensselear Polytechnic Institute, 1912.

A. R. Williams New General Manager in Providence

Alonzo R. Williams, counsel for the United Electric Railways, Providence R. I., has been appointed general manager of the company, succeeding Edgar J. Dickson, who resigned a few months ago. As general manager, Mr. Williams will be responsible for the transportation department, and also all details on transportation and public relations that come before state, county and city authorities and civic organizations.

A. R. Williams

Mr. Williams has been connected with the law department of the company and its predecessor, the Rhode Island Company, since 1902. He was closely associated with the late Henry Hayes, Lefferts Hoffman and Frank T. Easton in handling legal affairs for that company. For more than 25 years he has represented the Rhode Island Company and the United Electric Railways in actions at law in both State and Federal courts.

A direct descendant of the founder of the State of Rhode Island, Mr. Williams was born in Providence on Oct. 20, 1877, the son of the late Alonzo Williams, for many years a professor at Brown University. He received his early education in the public schools of Providence. He is a graduate of Brown University. He also studied in Germany, France and Italy and at Harvard Law School. Leaving Harvard, he entered the practice of law.

Mr. Williams enlisted in the Rhode Island Militia in 1897 and was retired after 27 years with the rank of colonel, by act of the General Assembly.

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Mr. Williams recently announced that he was a candidate for a Superior Court judgeship which it is expected the Legislature will create at its present session. Following his promotion by the United Electric Railways, he said he would continue his candidacy. In taking up his new duties he made an appeal for co-operation of the company's patrons.

No Change in New Jersey Officers Under Consolidation

Matthew R. Boylan, vice-president in charge of operation of both the Public Service Railway and the Public Service Transportation Company, Newark, N. J., will retain for the new consolidated company, Public Service Co-ordinated Transport, the same staff as presided over the various branches of the two merged companies, which includes: Arthur T. Warner, general manager in charge of traffic; Martin Schreiber, general manager in charge of plant; Louis P. Baurhenn, director of personnel; Edward A. Tuson, general auditor.

The division managers will assume similar duties in the new company, namely, James M. Symington, Essex; William H. Shepherd, Hudson; Joseph C. Rutledge, Passaic; J. Walter Wright, Bergen; Philip F. Maguire, Central; George A. Rothery, Southern.

J. E. Wilmot Becomes Buffalo Passenger Traffic Manager

President Yungbluth of the International Railway, Buffalo, N. Y., announced the appointment of J. E. Wilmot on Jan. 28 as passenger traffic manager for the International Railway and International Bus Corporation of Buffalo, N. Y. Mr. Wilmot, formerly general traffic solicitor, succeds Clarence E. Mitten, who leaves for Philadelphia, where he will take charge of the new business department of the Philadelphia Rapid Transit Company and associated companies.

Mr. Wilmot is a native of New York City. He is well-known in Buffalo and vicinity through his former connection with the Western New York Motorbus Lines and the Rochester-Buffalo Motorbus Line. Previous to his going to the International Railway he had five years' experience with the White and three years' with the Mack companies, makers of buses and trucks. For the past year he has been engaged as general traffic solicitor, with headquarters at Niagara Falls.

H. P. Lesswing Heads Buffalo Co-operative Association

Harold P. Lesswing, an electrician, has been elected president of the International Railway Co-operative Association, representing the 3,000 employees of the company in Buffalo and western New York. He succeeds William E. Murphy.

Maxwell H. Sherman, operator on the Broadway division of the local lines in Buffalo, was elected vice-president of the organization.

Kentucky Association Elects Samuel Riddle

The latest honor for Samuel Riddle, vice-president of the Louisville Railway, Louisville, Ky., is his election as president of the Kentucky Association of Public Utilities. This distinction was conferred upon him at the final session of the convention of that body on Jan. 19. Mr. Riddle is well-known in Louisville and in transportation circles throughout the country. He has been associated with the Kentucky property since 1910 when he became superintendent of transportation. Some years later he was made vice-president and when duties were realigned in 1925 he continued in that capacity.

Samuel Riddle

Mr. Riddle was identified with many railway properties before his connection with the Louisville Company. In 1903 he was in charge of the erection of buildings and installation of equipment for the Connecticut Railway & Light Company. Later he was connected with the Rhode Island Company, the Chicago, South Bend & Northern Indiana Railway and the Philadelphia Rapid Transit Company.

Mr. Riddle was graduated from Swarthmore College, Pennsylvania, in 1897 with the degree of bachelor of science and engineering. In the fall of that year he became associated with Dr. W. A. Drysdale, consulting and mechanical engineer, Philadelphia. He continued in that capacity for five years. Later he went with the engineering department of the United Gas Improvement Company, Philadelphia. All these facts and others have been told from time to time in the pages of ELECTRIC RAILWAY JOURNAL. By now everybody knows "Sam" Riddle, who has been identified with many activities in the city of Louisville, including the Louisville Board of Trade, Rotary Club and Engineers and Architects' Club.

America Seen Through Foreign Eyes

Australian official thinks maintenance better abroad than here. Many trolley cars out of date

F. N. MACLEAN, chief draftsman chief electrical engineers' branch, New South Wales Government Railways and Tramways, Sydney, Australia, spent several days in New York during the week ended Jan. 21 upon his arrival from Europe, where he has been studying local transportation in the principal cities of Great Britain and on the continent. He left Sydney last summer in company with W. L. Ada, power superintendent of the same company, and has visited the larger cities in the United States, Canada, Great Britain, France and Germany. Mr. Ada met with an accident in London and was forced to return home from there, but Mr. MacLean came back to the United States and will sail for Sydney from Vancouver about Feb. 8.

One of the objects of the trip was to study the latest developments in car design. In Sydney, due to the temperate climate, cars are of the cross-bench type with a large number of doors on the sides. Mr. MacLean believes that type of car for the present conditions makes it possible to load and unload passengers in a minimum of time. He doubts that it would be possible at present to go to the American type of car either of the center entrance or end entrance types. He stated, however, that the problem at Sydney was changing due to the advent of the rapid transit system and also to the ever-increasing vehicular traffic, and that at some time in the future it may be necessary to use a different type of car. In this event he prefers the American practice rather than the European. He does not favor the double-deck car for the system with which he is connected.

Mr. MacLean was very much interested in the methods of loading cars and handling passengers in the United States, and in the traffic congestion problems here. He feels that when the parking problem in this country has been solved, the United States will have gone a long way toward solving the traffic congestion situation. He also believes it may be necessary to resort to the segregation of various kinds of vehicular traffic in order to obtain the most efficient use of the streets.

Upon his return to America after his visit in Europe, Mr. MacLean came to the conclusion that both equipment and track are far better maintained abroad than here. He believes that in this country there is considerable opportunity for the improvement of track conditions.

As for cars, Mr. MacLean feels that noteworthy improvements have been made in this country for the comfort and convenience of passengers, but is impressed with the fact that too many old cars are being operated. They do not correspond favorably in appearance with the modern motor buses or cars.

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Manufactures and the Markets

Upward Trend in North Central and Mountain States

Business and industry in the North Central States entered the new year with a rather optimistic outlook. December witnessed subnormal rates of operations in some of the basic industries, but many of these industries reported that new orders for future delivery had improved materially. The iron and steel industry is on the upward trend, and operations in the motor car manufacturing plants is distinctly upward. 1928 should be a record year in the production of new automobiles and trucks.

Coal output in the section continues to be restricted, but general construction continues on a high scale and gives every indication of improving. High stock prices have compensated very largely for the decline in grain prices from last summer. The first week of the new year witnessed an increase in bank clearings of about 13 per cent over the first week in January, 1927. The underlying trend and sentiment are distinctly upward.

The year closed with business conditions in the Mountain States materially upward, volume of trade higher, flour mills and sugar refineries busy, copper output increased, crops and prices favorable, and livestock conditions excellent, and the coal strikers returning to work. Manufacturing, however, was generally quiet, coal production curtailed by strike, building quiet, and some labor surplus. The year ended, as a whole, on a favorable plane. A distinct feeling of optimism prevails in the Mountain States as the year opens.

Economic Currents of United States to Be Studied

A committee of leading business men and economists whose names will be announced later has been appointed by Secretary Hoover to supervise a far reaching inquiry into the changes in economic currents in the country, according to the Department of Commerce. Private individuals have subscribed the necessary money to enable the committee to pay the expenses of the Bureau of Economic Research of New York, to make the fact-finding background, and the co-operation of the Department of Commerce will be given.

It is proposed to determine facts with regard to such questions as the shifts in employment, changes in methods of production in industry and agriculture, and in distribution, shifts in relative price levels and profits, movements in the business cycle, shifts in standards of living, foreign trade and foreign credits, and other allied subjects which bear upon an understanding of the general business situation of the country. It is expected that the inquiry will take some months and will be made of most exhaustive order.

Resolutions on Outside Exhibits Adopted

The executive committee of the American Electric Railway Association at its meeting held in Cincinnati, Ohio, on Jan. 27 passed the following resolutions in connection with the 47th annual convention and exhibit of the association scheduled for Cleveland, Sept. 22 to 28, inclusive.

RESOLUTION No. 1

Whereas, the executive committee in previous years has passed certain resolutions looking with disfavor upon the practice of certain manufacturers in demonstrating buses and staging exhibits in hotel rooms and other places away from the Exhibit Halls and inviting delegates to their demonstrations and exhibits, and

Whereas, in general, the manufacturers have co-operated at recent conventions in abstaining from such practices and thus promoting the success and welfare of the main exhibition of the Association by encouraing delegates to concentrate their study upon said exhibits in the exhibition halls, be it

Resolved: That this executive committee in meeting assembled the 27th day of January, 1928, hereby vote to express its appreciation of the co-operation upon the part of the manufacturers, and to request the continuation of their wholehearted support in this matter.

RESOLUTION No. 2

Whereas, the practice of setting aside one day during the Convention week for the intensive inspection of exhibits by operating members has proved to be a general success during the several previous conventions and

Whereas, many expressions of appreciation and other favorable comment from both railway and manufacturer members has resulted from this practice, be it

Resolved: That the executive committee in meeting assembled this 27th day of January, 1928, again vote to set aside one day, the date to be determined later by the Committee on Convention arrangements, to be devoted exclusively to exhibit inspection, and request that no meetings of any kind be scheduled for that date.

RESOLUTION No. 3

Whereas, the 47th annual convention of the American Electric Railway Association will again be held in the City of Cleveland, in the vicinity of which city there are located the plants of many of our manufacturing members, and

Whereas, it is considered desirable that an opportunity be provided for delegates in attendance at the Convention to visit such manufacturing plants in such a way as not to interfere with attendance at the convention meetings or the exhibits, be it

Resolved: That this executive committee in meeting assembled this 27th day of January, 1928, hereby vote in view of the fact that the convention and exhibit closes at noon on Friday, Sept. 28, 1928, to suggest to all Manufacturer Members, that all inspections of Cleveland plants be definitely set for Friday, Sept. 28, at any time after 12:00 o'clock noon, or on Saturday, Sept. 29, at which time any manufacturers who might desire to hold open house at their plants for such inspection, might do so with the approval of the executive committee.

The Executive Committee approved the budget prepared by the director of exhibits based on a rate of 60 cents per square foot for all inside exhibition space, and $2.00 per lineal foot for all track space.

Converting Six Passenger Cars into Snow Fighting Units

Conversion of six motor passenger cars of the Gary Railways, Gary, Ind., into snow-fighting units at a total estimated cost of $25,000 has begun in the company's shops at Gary. Four cars are now being converted into sweepers, with motor-driven brooms, new controllers, salt boxes and sand bins with one-ton capacity each. Two cars are being equipped as double-end sweepers, similarly fitted and provided with modern wrecking apparatus.

Morton Products Described in De Luxe Catalog

An attractive and handsomely designed general insert catalog has been issued by the Morton Manufacturing Company, Chicago, Ill., descriptive of its line of railway appliances and industrial steel products. The book has a dark green embossed leather covering and contains an index giving the section and page number. Celluloid tabs divide the sections from A to L. In the forword it is stated that "the purpose of this catalog is to present in a clear, concise and comprehensive manner detailed descriptive and pictorial informative data calculated to be of substantial assistance to those persons charged with the decision and intelligent selection of railway and such other supplies, as are displayed on the following pages." The book is replete with illustrations and is arranged in a convenient serviceable manner for ready reference.

Chicago & Joliet to Spend Approximately $160,000

New equipment and reconstruction work for the Chicago & Joliet Electric Railway, Joliet, Ill., during the current year will amount to approximately $160,000, it is reported. A new substation at Lemont and new tracks on Morgan and Hickory Streets in Joliet are principal items of the budget. No new cars are included in the year's program.

New South Bend Station Ready for Use

Arrangements were made to open on Jan 28 the new station at South Bend, Ind., for South Shore Line passengers.

The South Bend station improvement is an added step in the program of rehabilitation of the South Shore Line begun two years ago by the present management, and reviewed previously in ELECTRIC RAILWAY JOURNAL. Up to the first of this year, more than $5,000,000 had been spent on this railroad to bring it up to the standard of operation now maintained. New steel cars, increased frequency and speed of service, automatic safety block signals of the latest type, complete re-electrification, many miles of new 100 lb. rail and double track, station improvements, new freight equipment and many other extensive changes have been made.

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Metal Markets Quiet but Steady

Buying of non-ferrous metals in the week ended Feb. 1 has been small, but prices are little changed from those obtaining last Wednesday in the domestic market. Copper had been dull until Feb. 1 when an incipient buying wave started. A moderate business was done in both lead and zinc, prices for the former tending to weaken as a consequence of material declines in London. The afternoon of Feb. 1 wire-drawing interests entered the copper market rather unexpectedly and bought about 5,000,000 lb. of copper at 14.125 cents, delivered in Connecticut.

Primary producers have continued to stand pat at the 14.125 cents price, Connecticut. Moreover, they have made sales at that figure each day during the week; and business has been done on Jan. 30 and 31 at so-called Middle West points at 14.25 cents and even a little higher. On the other hand, one or two customs smelters have shaded the even eighth by from 2½ to 5 points. Incidentally, two interests that come under this classification have been firm at 14.125 cents. Foreign copper business at 14.50 cents c.i.f. has been fair.

Modest sales of zinc have been made at prices ranging from 5.65 cents to 5.70 cents. An occasional car of High-Grade is sold in New York on the basis of 7.75 cents.

Lead business was fairly good until Jan. 30, when the continued decline in London caused buyers to wonder if a reduction in prices on this side was not in order, so for the last three days the market has been very quiet indeed. The American Smelting & Refining Company continues its contract price at 6½ cents, New York.

Lead has been freely offered in good tonnages all week at 6¼ cents, St. Louis.

The tin market continues quiet, with daily sales in the neighborhood of 200 tons. Though prices have declined slightly from those of a week ago, the drop has not been sufficient to stimulate much buying.

The 99 per cent grade is practically out of the market and quotations are only nominal.

METAL, COAL AND MATERIAL PRICES
F. O. B. REFINERY

Metals—New York	Jan. 31, 1928
Copper, electrolytic, cents per lb.	13.875
Copper wire, cents per lb.	16.125
Lead, cents per lb.	6.50
Zinc, cents per lb.	6.025
Tin, Straits, cents per lb.	54.625
Bituminous Coal, f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	.....
Somerset mine run, Boston, net tons	.....
Pittsburgh mine run, Pittsburgh, net tons	.....
Franklin, Ill., screenings, Chicago, net tons	1.70
Central, Ill., screenings, Chicago, net tons	1.50
Kansas screenings, Kansas City, net tons	2.125
Materials	
Rubber-covered wire, N. Y., No. 14, per 1,000 ft.	5.30
Weatherproof wire base, N.Y., cents per lb.	16.75
Cement, Chicago net prices, without bags	2.05
Linseed oil (5-bbl. lots), N. Y., cents per lb.	10 2
White lead in oil (100-lb. keg), N. Y., cents per lb.	13 25
Turpentine (bbl. lots), N. Y., per gal.	$0.65

TRACK AND LINE

VIRGINIA ELECTRIC & POWER COMPANY, Richmond, Va., on Jan. 29 placed in service a 1-mile, double track extension to its Belmont Avenue line. The extension was constructed at a cost of $63,000. It will serve the rapidly growing west end residential section of the city. Extending from Westhampton Avenue to Granite St., the new tracks will furnish additional transportation facilities for one of Richmond's largest parks and athletic fields. Construction is of the most modern type. Mention that the work had started was made in the JOURNAL Nov. 5.

TRADE NOTES

C. E. SMITH & COMPANY, consulting engineers, Railway Exchange Building, St. Louis, Mo., have sent out a card which announces that this consulting engineering business will be continued under the title of C. E. Smith & Company, by men who have been associated with the company for five to twelve years, among them the following: Manager, M. H. Doyne; secretary and treasurer, M. C. Beck; M. H. Doyne, civil engineer; S. B. May, civil engineer; R. M. Boyle, mechanical engineer; B. F. Thomas, Jr., electrical engineer; M. M. Kinsey, civil engineer; F. R. Nohl, civil engineer; R. L. Saettele, engineer and cartographer, and others.

O. S. TYSON & COMPANY, INC., New York, recently announced that W. L. Towne had joined its organization as a vice-president and member of the board of directors. Mr. Towne's experience embraces engineering with the Connecticut Company and the Ontario Power Company; instructor of steam and electrical engineering, McKinley Manual Training School; assistant technical editor, United States Geographical Survey; engineering and design, American Optical Company; advertising engineer, General Electric Company; advertising manager and assistant sales manager, the Austin Company, and national advertising, in charge of educational advertising for the General Electric Company.

DREW ELECTRIC & MANUFACTURING COMPANY, Cleveland, Ohio, announces that it has sold its business of trolley line material and fittings to the Ohio Brass Company, Mansfield, Ohio.

MERZ & MCLELLAN, London, England, wish to make it clear that it is their Newcastle office only that has removed to Carliol House, Newcastle-upon-Tyne. Their London office remains at 32, Victoria Street, Westminster, S.W. 1.

NATIONAL CARBON COMPANY, Inc., carbon sales division, Cleveland, Ohio, announced the opening on Jan. 3 of branch sales offices at the present brush service plants of the company in New York City, Chicago, Ill., Pittsburgh, Pa., and Birmingham, Ala. The addresses of the new offices are: 357 West 36th Street, New York, N. Y.; 551 West Monroe Street, Chicago, Ill.; Arrott Power Building, No. 3, Barker Place, Pittsburgh, Pa., and 1824 Ninth Avenue North, Birmingham, Ala.

A. H. GRAYBURN, assistant secretary and assistant treasurer of the Norma-Hoffmann Bearings Corporation, Stamford, Conn., has resigned to take an executive position with the Hope Engineering & Supply Company of Mount Vernon, Ohio, and New York City. A. H. Ritter, New York district manager, goes to Stamford as assistant secretary, and will be succeeded in New York by F. W. Mesinger from the Stamford office. Norman Bell, assistant sales manager, has also been made assistant secretary. E. C. Lenon at Stamford will be in charge of orders, shipments, credits and collections.

LINCOLN ELECTRIC COMPANY, Cleveland, Ohio, announces the transfer of John Van Horne from Atlanta to Moline, Ill., where he will be located at 514½ Fifteenth Street, covering the Tri-Cities, on the sale of its products. He will operate under the direction of R. D. Malm, Western manager at Chicago, Ill.

TIMKEN ROLLER BEARING COMPANY, Canton, Ohio, has authorized the expenditure of $4,000,000 for the coming year to be devoted to increasing the production facilities of the company. The greater part of this expansion program concerns the company's plant at Canton, where both the steel mill and the bearing manufacturing plant proper will be considerably enlarged. Among other features a new substation will be built for supplying electric power for both the steel mill and the factory.

ADVERTISING LITERATURE

MONITOR CONTROLLER COMPANY, Baltimore, Md., has recently issued bulletin 111, with illustrations and descriptions of its resistors.

TIMKEN ROLLER BEARING COMPANY, Canton, Ohio, has issued a booklet "The Truth About Anti-Friction Bearings," in which the design, function, necessity and performance of such bearings are discussed.

GENERAL ELECTRIC COMPANY, Schenectady, N. Y., has recently issued a booklet "The Application of Electric Drive to Motor Buses." The booklet is illustrated with pictures and charts.

MARTINDALE ELECTRIC COMPANY, Cleveland, Ohio, announces a four-page folder, illustrating and describing three types of portable blowers. The company states that the folder will be mailed on request.

SCHWEITZER & CONRAD, INC., Chicago, Ill., has issued an illustrated 20-page looseleaf bulletin descriptive of its "S and C" high potential fuse.

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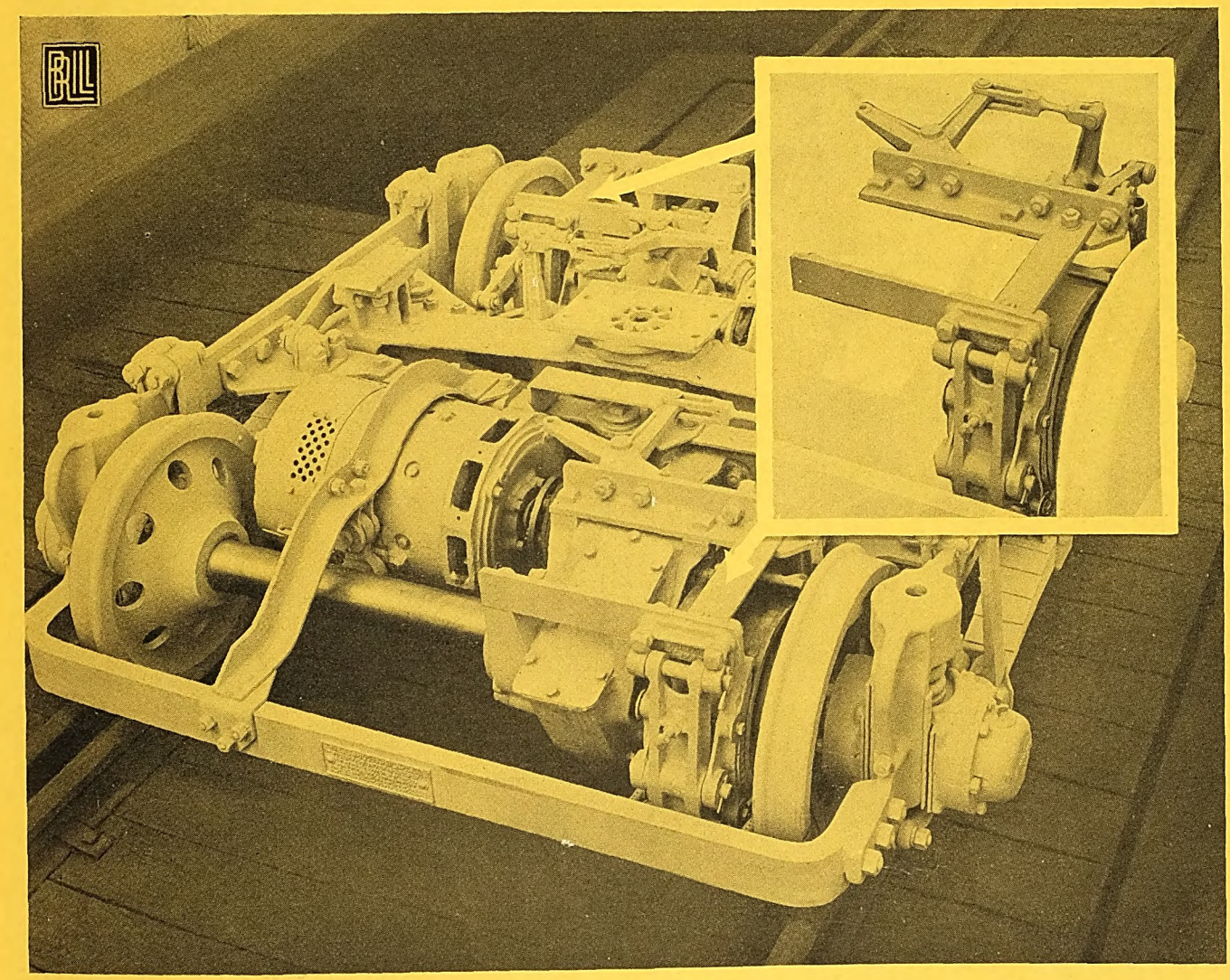

The Absence of Complicated Parts Permits Easy Brake Inspection

THE external contracting shoe-type drum brakes of the Brill 1928 Model Car were designed to eliminate many rigging parts. This was accomplished by pressing a wide drum on each axle, diagonally opposite each other and connecting the air cylinders direct to the pressure applying levers. Each air cylinder is placed directly adjacent to the drum.

This elimination of rigging parts reduces noise and increases brake efficiency, yet inspection is as simple a process as with the commonly used brake shoe and head applied to the wheel.

The removal and replacement of brake blocks in this new shoe-type drum brake can be accomplished without removing wheels, drums or any other parts.

THE J. G. BRILL COMPANY
PHILADELPHIA, PA.
AMERICAN CAR CO. ST. LOUIS MO. — G. C. KUHLMAN CAR CO. CLEVELAND, OHIO. — WASON MANF'G CO. SPRINGFIELD, MASS.

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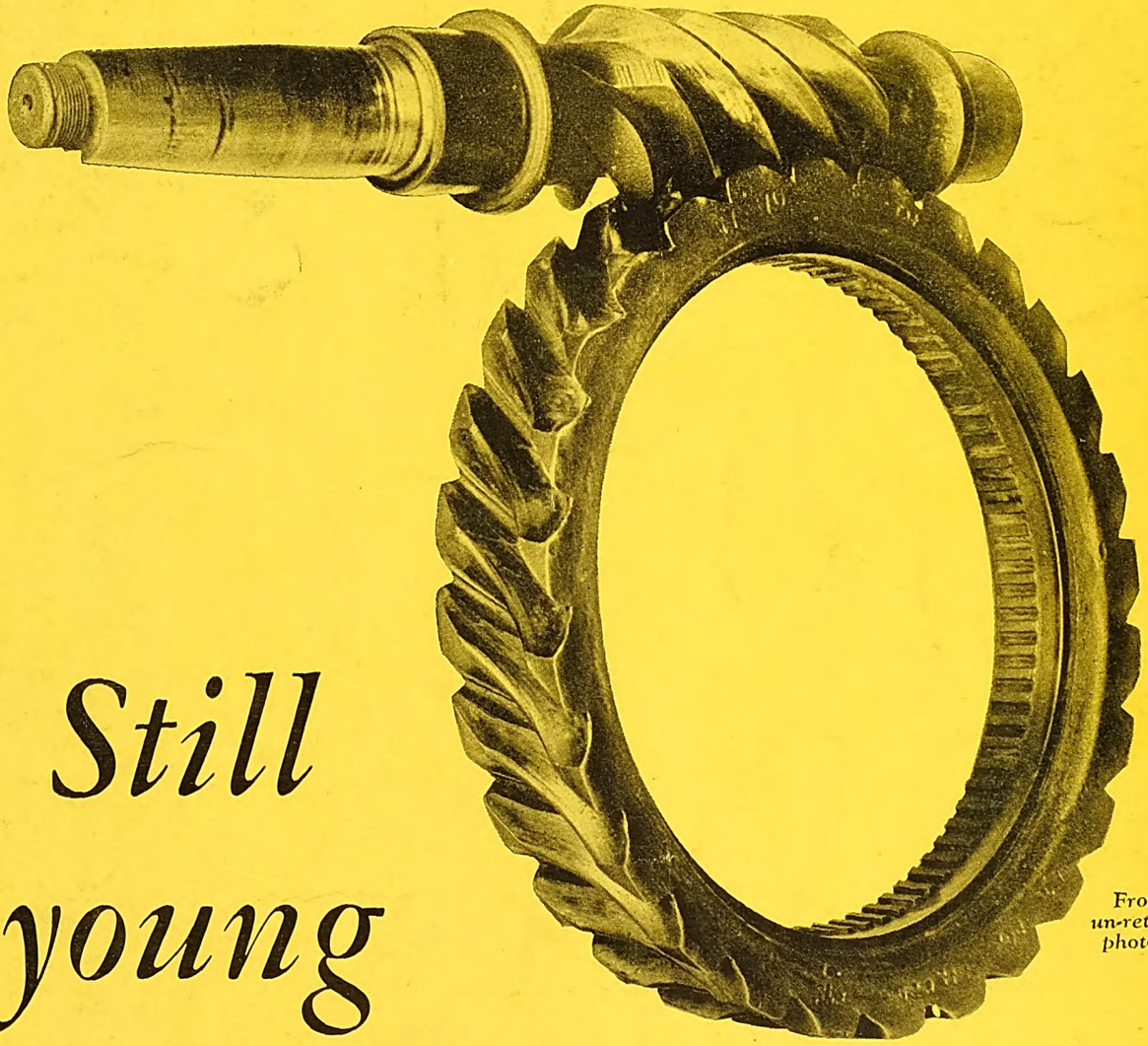

From an un-retouched photograph

Still young –after 585,000 miles!

THIS worm and gear were removed from a motor coach operated by the Mesaba Transportation Company of Hibbing, Minnesota, after 585,000 miles of trouble-free service.

The bronze gear shows *a little* wear; the worm itself, none. They are ready to go back into service—and from all indications would go another 585,000 miles.

It is excellent proof that worm-drive is sturdy, long-lived, efficient—the ideal final drive.

THE TIMKEN-DETROIT AXLE CO., DETROIT, MICH.

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ELECTRIC RAILWAY JOURNAL

Graw-Hill Publishing Company, Inc. FEBRUARY 11, 1928 Twenty Cents per Copy

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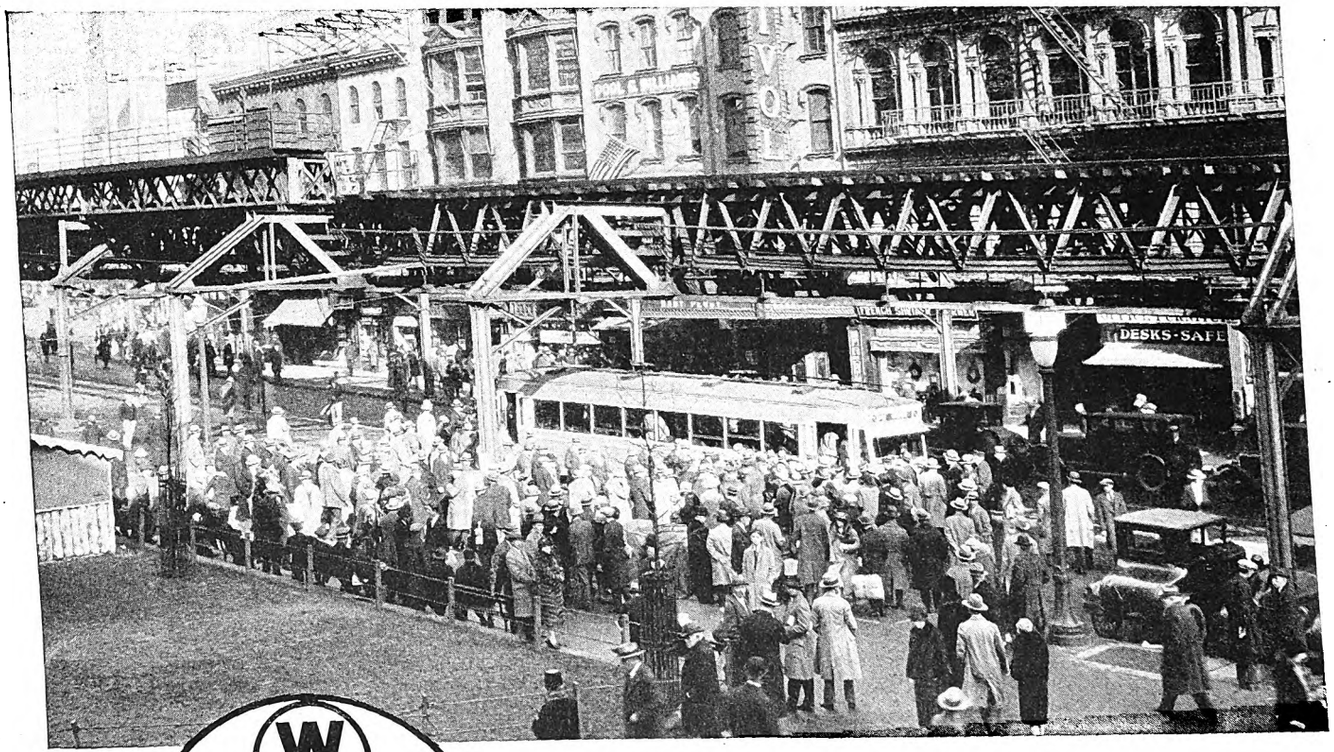

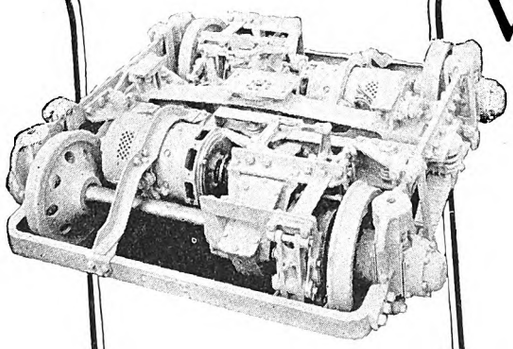

W-N Drive Installation

W-N Drive advantages

Lowest steps
Faster acceleration
Quiet operation
Motors spring borne
Gears run in oil
Greater clearance
Lighter weight
Lower maintenance

What the Public Has Been Waiting for

THE enthusiastic crowds in Brooklyn that greeted the new W-N drive car at every stop are evidence of the public's interest in improved transportation.

Their whole-hearted appreciation of the many superior qualities of the W-N drive is forcefully expressed in some of their written comments:

"What the people of Brooklyn have been waiting for."

"A trolley with comfort supreme, why own an automobile?"

"100% better than any cars yet seen in Brooklyn."

"Something long looked for and wished for."

and thousands of others.

Such comments handed in by patrons after riding are proof that the W-N drive supplies the quietness, comfort and speed the public has been waiting for.

Westinghouse Electric & Manufacturing Company
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Sales Offices in All Principal Cities of the United States and Foreign Countries

MEMBER AERA 1928

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Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review
Published by McGraw-Hill Publishing Company, Inc.
CHARLES GORDON, *Editor*

Volume 71 New York, Saturday, February 11, 1928 *Number 6*

It Depends on Whose Ox Is Gored

WHILE New York, under the leadership of its genial Mayor, Jimmie Walker, is marshalling its forces to fight to the last ditch the application of its rapid transit lines for a fare increase from 5 cents to 7 cents, there comes an interesting side light on how political expediency changes the tune with which the public's ears are regaled in the country's metropolis.

Speaking of plans for the extension and improvement of the water supply (a municipally-owned enterprise) the Mayor calls the attention of the Board of Estimate to the need for increased revenue. The water rates, he thinks, should be increased. He is reported by the New York *Times* to have said: "I myself paid $13.20 last year and that was for a three-story house in which seven persons lived. A 10 per cent increase would mean $1.32 more. I guess that wouldn't break me, and I don't think any taxpayer would object seriously to so modest an increase."

This is a municipal plant, of course. One's nerves could scarcely survive the shock of hearing a New York public official use that reasoning in connection with a privately-owned utility. The very arguments of expanding plant and improving service which are used by the so-called "traction interests" in soliciting a higher rate of fare are howled down by the defenders of the people in the one instance and used by them for the same proposition when it comes to the municipally-owned service. Of course, this doesn't demonstrate that the arguments are wrong. It only proves anew the old saw that it makes all the difference in the world whose ox is gored.

Let "Convenience for the Greatest Number at the Least Cost" Be the Slogan

IN ITS issue of Sept. 17, 1927, *Liberty* labeled street cars as archaic and on their way out. It called upon the motor car manufacturers of the country to produce a statesman of transportation who should lead us out of the hopeless traffic tangle which exists not only in large but in smaller cities as well.

ELECTRIC RAILWAY JOURNAL, in its issue of Sept. 24, challenged that suggestion from the standpoint of the public interest. Simultaneously, Mr. Storrs, managing director of the American Electric Railway Association, offered to supply *Liberty* with fundamental data regarding the relative importance of various transportation agencies in handling the masses of people who daily move back and forth on city streets.

Now *Liberty* has done a commendable thing. It started out to get the facts on the traffic situation. It interviewed men who are in position to talk with authority on this subject. And in a series of three articles, the last of which was published in its Feb. 11, 1928, issue, William F. Sturm tells the story of the traffic tangle in the light of this new knowledge. Mr. Sturm got the facts. *Liberty* had the courage to publish them. In doing so it "scooped" the entire popular press of the country in presenting for the first time so comprehensive a discussion of the baffling problem of traffic from the standpoint of the public interest.

Mr. Sturm, as the result of his investigations, concluded that a fair solution of the problem requires adequate consideration of all the transportation factors involved in it—automobiles, street cars, rapid transit lines, and railroads. He omitted trucks used in the movement of freight and commodities on city streets, which should also be included. He then says: "The co-ordination of all methods of transportation is necessary in order to solve the problem in the broadest way. While it may be true that the motor industry is directly responsible for traffic saturation, still the problem does not belong to it alone. Steam and electric roads should see the wisdom of such an institute *to study the problem from the standpoint of the public interest and to develop economically sound principles for bringing about relief.*" (The italics are ours.)

Regardless of the merit or practicability of the idea of a traffic institute, electric railways need little urging to take an interest in the traffic problem. Not only are they now taking a very active interest, but they are anxious to promote a sane solution. They are content to rest their case of the right to existence on the broad ground of the public interest and to have the matter of traffic congestion relief approached on the principle of the greatest good to the greatest number. In Chicago the railway has definitely taken the lead in championing the public's interest in traffic matters. The results already achieved there are making traffic history and testify eloquently to the public-spirited viewpoint of the railway's engineers and to the good judgment of the public in placing its traffic problem in their hands.

The viewpoint from which the traffic matter is approached and the principles upon which proposed relief measures are based (or the lack of them), affect the economic soundness of plans that are suggested. There is hopeless confusion of thought on the whole subject and total lack of public understanding. Even experts differ widely on some of the fundamental factors involved. Traffic and transportation are tied inseparably with the broad problems of civic development and community planning. Yet many city planning commissions give totally inadequate attention to making adequate provision for vitally needed rapid and economical transportation. The JOURNAL hopes that the popular press of the country will follow *Liberty's* lead in going after the facts of the traffic tangle. Then let the solution be championed under the banner: "Convenience for the greatest number at the least cost."

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Interborough Fare Case Presents Interesting Legal Aspects

AS A RULE, better progress can be made by railway companies in securing necessary fare increases by frank dealing with the authorities and public than by resort to the courts. There are times, however, when the courts are the only recourse. This may be the case in New York with the Interborough Rapid Transit Company if its request for a higher fare is refused by the Transit Commission for want of authority or on any other ground.

For years the company has been endeavoring to give service at an inadequate fare. To do so it has asked the holders of its securities to make sacrifices, which for the most part they have done. But when the Transit Commission recently indicated that it intended to order the company to spend $39,466,000 for new cars, platform extensions and other changes, it was obvious that some positive movement for relief had to be made. Without a higher fare the necessary capital for these changes could not be secured.

While the Interborough application is based on the usual ground that the company is not receiving a reasonable return on the fair value of the property, its petition to the Transit Commission is especially interesting from a legal standpoint for two reasons. One is because of the unusual franchises under which the company operates. The other is because it groups in its exhibit of return the earnings, expenses and rental of a leased property, the Manhattan Elevated Railway, though it also claims that a fair return is not being earned on the subway system itself. The Manhattan Railway is considered part of the system covered by the so-called 1913 contract because, in that contract, through services over certain of the two divisions were required, free transfers between them were specified at certain points and the city acquired a right to share in the earnings of the Manhattan Railway third track and extensions.

While the city is the owner and lessor of the subway proper, as distinguished from the equipment, the company holds that in this capacity the city is acting in a proprietory, and not in a governmental, capacity. Hence, its status in this ownership is similar to that of any railroad company and the fares to be charged on its leased subway track are subject to the regulatory power of the state. To strengthen this contention the company points out that nowhere does its franchise say that the fares to be charged are to be determined by the city authorities.

The financial returns of the company for 1927, based on the Transit Commission's figures of reproduction costs, vary from 1.76 per cent for the Manhattan Elevated Railway, to 2.98 per cent for the subway division. The returns during each of the previous six years are not greatly different.

Besides this low return on the value of the property, the company urges several special circumstances which emphasize the justice of its claim. One of these is that the city, though a partner in the enterprise both in investment and in profits, is building a competing rapid transit railway that will take from the company's lines at least 110,000,000 passengers a year. This competition, it points out, was not contemplated in the 1913 leases and contracts. The second circumstance is the proposed order of the Transit Commission for new cars and the order actually made for extension of local platforms and other changes, as already mentioned. It is obvious that some means must be found to improve the company's credit if it is to raise the money to carry out the commission order for improved facilities.

The essential relation between service and fare has been placed squarely before the New York public, which has been so long misguided by the 5-cent fare fetish of its politicians. For the best interests of the city, the higher fare should be granted.

Home Construction of Cars Is Deceptive Economy

SOME few street railway managements in this country are under the impression that they can build their own cars at a price lower than similar cars can be purchased from a car builder. "We must have our shops for maintenance work anyway," they argue, "and we can save most of the overhead cost on any cars which we build. Moreover, a certain amount of car construction will give a better load factor on our men because they can fill in time on car building which otherwise would be lost."

The idea that there is economy in cars so built is specious. There is every reason why a car builder can put out a better car and build it more cheaply than a railway company. When car bodies were entirely of wood, the differential in cost between the car builder and the repair shop was smaller. But economical steel car building requires machinery and methods which are out of place in the usual repair shop.

Building cars in quantity as he does, the car builder can afford to keep in touch with improvements in design and in methods of manufacture. Some of his methods and equipment are patented and could not be used by the home builder. Where cars are built in considerable quantity at home, there is a tendency, almost overpowering, to cling to one design regardless of the progress in the art.

A railway company building its own cars is likely to be deceived as to the cost of the work. The chances are that not all elements of cost are included. Overhead charges are apt to be undervalued, especially when manufacturing is undertaken in a shop poorly adapted to the purpose. The rearrangements required, the attention given to the work by the higher officials not actually occupied with it, the extra accounting needed, the additional interest and insurance required—all these are essential elements of cost that are usually underestimated and often overlooked entirely.

Most serious of all, the time and attention of the officials in charge of the work, and the space in the shops, are diverted in part at least to the problem of car building instead of being concentrated on maintenance. Unless there is a separate organization and additional space equivalent to that which a car builder would need, maintenance is bound to suffer. The extra cost of maintenance and the loss of reliability of the service almost invariably far outweigh any economic gain to the railway. Experience has proved this to be so despite the best of intentions.

It should be remembered that the primary purpose of a railway is the safe and speedy operation of its cars. Anything which detracts from this is apt to be of very deceptive economy. Electric railway companies can well keep out of car building.

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In Most Cities Electric Car Speed Can Be Increased Easily

FIGURES quoted in the discussion on traffic signals at the New York Electric Railway Association convention this week indicate that in congested traffic, electric cars make only half the speed of automobiles, largely because of the stops required to receive and discharge passengers. If the low speeds just quoted are true, it means that the cars miss practically every other "go" signal, and that any reasonable means for reducing the time spent at stops would greatly help the situation. It was during the discussion on this subject that H. N. Smith of the Municipal Bureau of Gas and Electricity, Syracuse, N. Y., made the very pertinent inquiry, why not more raised island platforms at car stops, and why not more skip stops?

As Mr. Smith pointed out, raised platforms when protected at the ends by bulwarks give a feeling of security to waiting and discharged passengers, which is not afforded by less permanent safety zones. They thus permit waiting patrons to be ready to board the car when it arrives, and they permit those leaving the car to remain in a safe place until they have a chance to reach the curb. Skip stops, he pointed out, while introduced during the war quite generally to economize fuel, should be equally useful in time of peace to economize time. In sections where streets are skipped, an electric car should be able to make as good time as the automobile, and so more nearly approximate its over-all speed.

There is no doubt that the low speed made by cars in congested streets is one of the most serious obstacles to economical operation, as well as a discouragement of patronage. Every effort should be made through rapid acceleration, rapid braking and short passenger stops to bring the schedule speed of the cars up to that of the other vehicles which use the street. Still another suggestion along these lines, that comes up from time to time though not brought out at the meeting, was whether the time had come to have electric cars stop at the far corner rather than at the near corner, at least in the congested districts.

Observations on a number of streets with manually controlled signals indicate the following situation: As the electric car approaches the near corner its further movement is prevented by automobiles on the track, as well as at the side, all waiting for the "go" signal. When this is given, the electric car is often in the middle of the block, and by the time it gets to the corner and receives and discharges its passengers the time for the green signal has passed, and the car must wait for another cycle. If this happens regularly, the car misses one signal at each corner. This may be the reason that the electric car makes only half the speed of the automobile on the same street, as quoted by one of the speakers at the New York meeting.

Assume, however, the far stop. The car, as before, waits for the green signal, perhaps midway in the block, because it cannot get nearer with automobiles on the track. When the green signal is given, the car makes the crossing with the group of automobiles accompanying it, and then stops and discharges its passengers at the far corner, preferably on a raised platform 20 or 30 ft. from the corner, rather than directly at it, so as not to be in the way of automobiles making the turn. It then proceeds as near to the next corner as possible to repeat the performance. While it may miss a traffic cycle occasionally it does not seem that this should happen as frequently as with the near-side stop.

Conditions have changed entirely since the near-side stop became general some 25 years ago. Previous to that time the far stop was generally used, because the streets at that period were muddy and with the far stop the passengers could use the "cross walk" in passing between curb and rear platform. The main argument in favor of the near-side stop was that it would help to avoid collisions with vehicles crossing at right angles. At that time, of course, there were no traffic lights in use anywhere and very few traffic policemen. These arguments show what a tremendous change has taken place since the near-side stop was established. As regards city traffic, we are in a different age.

The far-side stop may not always be advisable, but it seems worth trying in congested streets. A distinctive stop sign, which should be put up anyway, would prevent any confusion on the part of waiting passengers.

Improvements in Equipment Permit Faster Schedules

SPEEDS of street cars, particularly in congested traffic, bear only a slight relation to the maximum speed which the motors can develop on a straightaway run. It has been pointed out many times that the schedule or average speed is determined to a great extent by the number of and time used in stops and the rates of acceleration and retardation. In other words, the car has so little opportunity to reach the maximum speed that its value is of little moment. On the contrary, with any given number of stops and standing time, the average speed will be greatest when the motors have the ability to start the car from rest and reach a reasonable speed in the shortest time, and the brakes have the ability to stop the car from this speed most rapidly.

Recent developments in equipment design have done a great deal to increase the possible acceleration and braking rates. Some of the results obtained were discussed in papers presented at the winter meeting of the New York Electric Railway Association. The new forms of drive with high reduction gearing have made possible the use of small, high-speed motors which still are able to accelerate the car more rapidly than has been practicable with the ordinary gear drive. In fact, tests have been made with one of the new types of drive that showed acceleration of 4.27 m.p.h. per second. This is far higher than anything used in practice, but indicates what can be done. Equally good results have been obtained with new types of brakes. Tests referred to by one of the speakers showed that from any initial speed of 20 m.p.h it was possible to reduce the stopping distance 40 ft. In schedules this works out to an increase in average speed of 6.4 per cent.

Apart from the ability to maintain faster schedules on a clear track, these improvements make it possible for the car not only to hold its place in the traffic line, but give it the ability to get away from a standstill faster than the average automobile, while being able to stop rapidly when necessary. To obtain the full advantage of these improvements requires skillful operators and good training; but these are necessities of present-day street railway service. Failure to take advantage of improvements such as these is likely to spell the doom of the non-progressive property.

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Most People Are Fair When They Understand

The street railway business has put its worst difficulties behind. The industry now needs new confidence in itself and the courage to tell its story to the public

By Roland B. Woodward

General Secretary Rochester Chamber of Commerce, Rochester, N. Y.

This article was the basis of an address by Mr. Woodward before the meeting of the New York Electric Railway Association held in New York City on Jan. 31. Coming as it does from a speaker representing the business man and car rider rather than the railway operator, it presents so complete a grasp of the railway situation in so forceful a manner as to commend it to every JOURNAL *reader.*—EDITOR.

WHEN the teacher asked the small boy what was the shape of the world, he pondered a moment and then replied, "Father says 'It's in a hell of a shape'." When anybody asks "What is the shape of the street railway business?" the common answer is similar. But the street railway business has passed the zero hour and is on the road to recovery. This recovery is not due to the fact that anybody likes the street car or wants the street car; but because at least four out of five need the street car and must have it to carry on from day to day.

The street car business has been the most maligned, condemned, abused and least appreciated and understood factor in our modern urban life. It has been the football of local politics, the source of unjust tax exactions, the object of unreasoning abuse. And the strange thing about it has been that the mass of the people, who must use it because they have no other means of transportation, have joined in the hue and cry and thought they were rendering a public service.

This is the strangest bit of civic crowd psychology I have seen in twenty years of experience in dealing with the public. Usually there is a crowd consciousness of identity with the thing they support and want and need. The baseball fans quickly espouse the cause of the home team though it may be made up of strangers from other cities. They pay for the privilege of rooting for it whole-heartedly. The readers and followers of a given newspaper swallow much they don't like, but loyally stick to their favorite and pay for the privilege year after year. It becomes an authority to them and does much of their thinking for them. The employees of a great industry develop a mass loyalty to all the life of that industry and are proud of its progress. But the street railway industry, great as it is and necessary as it is in the life of any city, has been bled and abused and abused and bled while its millions of users have stood on the side lines or have joined in the attack—not realizing that in the end they must pay the damages in poor rails. poor roadbed, poor cars, and inadequate service from an impoverished company.

I say the street car riders must pay in the end, though I know under a fixed fare plan how difficult it is to pass increased operating expenses on to the consumer. It is true that the stockholders suffer, but it may be that they can better afford to lose their money than the car users can afford to lose the service. But in most cases the stockholders won't lose because our communities are going to need mass transportation more and more as traffic conditions become more difficult.

MARKS FOR THE TAX COLLECTOR

Street car companies seem to have been shining marks for the tax collector. When they didn't make any money with which to pay taxes they took it out of their principal. The federal income tax, the state franchise tax on gross earnings, the municipal special franchise tax, and a few others add to their zest in making ends meet. But the most interesting one is inherited from the horse car days. Of course, the horses wore out the streets, to be sure not more than other horses, but these horses were especially attractive for taxation. The horses have long since passed away, but the tax is still with us. This tax, required by the state of New York from street railway companies, is unjust and indefensible. Without this burden the street railways are now taxed much more on their gross business than other utilities and nearly 80 per cent of every net dollar earned goes for taxes.

Chief Judge Cullen described the paving tax in his decision in the case of the City of Rochester vs. the Rochester Railway Company: "The tax," said Judge Cullen, "is paid in the form of paving and other materials for street construction. The materials which go into the paving are really purchased by the railway company and turned over to the municipality for the benefit of the community at large. The railroad derives no special or peculiar benefit from the construction of the paving; indeed it is a burden rather than a benefit."

That is carrying the taxing power pretty far. Let us see how it works. Nineteen feet width in a street with double tracks must be paved and kept paved by the street railway company. Who uses these 19 ft. of pavement?

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Everybody—trucks, wagons, pleasure cars. Eighty-five per cent of the occupancy of the street for traffic and for parking is by vehicles, not street cars. In addition to paying for the 19 ft., the street car rider is a taxpayer, and certainly the street car company, which is one of the largest taxpayers, must pay its part in the proportion of paving cost assessed against the city at large. This paving tax business goes further. Owners of property on a given street want it widened, or the city authorities want it graded or the development of a city plan requires that it be changed somehow to meet conditions in some other street. The owners and the car riders through their agency, the street railway company, are required to tear up good rails, good ties, a good foundation and chip in tens of thousands of fares, which, perhaps, are needed for new rails elsewhere in the city, or for new cars, or for more frequent service, to pay for relaying of track and repaving 19 ft. This sort of thing has cost the Rochester railway lines approximately $500,000 a year for several years.

WHENEVER government cripples a great public convenience or necessity by unjust taxation, by unjust restriction, or regulation, those who need and use that necessity suffer first, suffer most and suffer longest.—ROLAND B. WOODWARD

It requires 50,000,000 fares in one year to pay the street railway companies' paving bill in New York State. The answer, of course, is that the street car rider doesn't know the load that is being put on his back. He doesn't know that in the end he will have to pay the bill somehow. Whenever government cripples a great public convenience or necessity by unjust taxation, by unjust restriction, or regulation, those who need and use that necessity suffer first, suffer most and suffer longest.

Though the users haven't fully sensed it, there is an identity of interest between the owners and users of any wisely regulated public utility.

There is another group besides the street car riders vitally interested in the street railway problem. Good mass transportation is essential to urban life. This means manufacturing and retail trade. Stop street car service or cripple it and tens of thousands find it difficult to get to work. Management and the owners of industry have a vital stake in good transportation for their workers. When the worker is handicapped by inadequate service his job suffers or he loses the job. Industry can't afford to have either happen. If the workman pays for something he doesn't get—in the end industry will have to help foot the bill. Good transportation is essential to the worker and therefore to industry in our modern life. Large factory operation isn't possible without it. Mass transportation is a prerequisite of mass production.

PROBABLY four out of five retail customers are carried by street cars and not by automobiles. This consideration should not be overlooked when the retail merchant is importuned to use his influence to have the city set aside a third of the entire roadway for the storage, politely called parking, of private automobiles.—ROLAND B. WOODWARD

FOUR OUT OF FIVE ARE CAR RIDERS

Large retail business can't live off automobile trade. If private automobiles monopolize our streets and slow up mass transportation or cripple it, the movement towards decentralization of retail trading will be accelerated. Probably four out of five retail customers are carried by street cars and not by automobiles. This consideration should not be overlooked when the retail merchant is importuned to use his influence to have the city set aside a third of the entire roadway for the storage, politely called parking, of private automobiles.

The manufacturer and retailer have not taken any great interest in the problem of street car service. They have felt that it would work out its own solution. It probably will, but the solution of the problem would be speeded up if the manufacturers and merchants vitally affected would concern themselves to see that their employees and customers were given a service not handicapped by unreasonable taxation, not slowed up by traffic congestion or hampered by unwise regulation.

The street railway business must have had a naturally strong constitution. During my observation of twenty years, the street railway company in Rochester has submitted to a sufficient number of major operations to have put a less vigorous business under the sod. This vitally testifies to a public need. No substitute has been found. The increase of automobiles from 4,500,000 in 1917 to probably 24,000,000 in 1928 has checked the growth of mass transportation, but has also enlarged the riding habit from which the street car companies will eventually benefit. The fact that street cars represent only 15 per cent of the occupancy of the street, and at the same time carry 85 per cent of the people transported, justifies it as a necessity that must be given consideration in our increasing traffic problem.

Let me quote you from an address before the American Electric Railway Association by Sidney D. Waldon, president of the Rapid Transit Commission of Detroit:

> A pedestrian takes up about 10 sq.ft. A moving automobile, with a safe margin all around, occupies 270 sq.ft. Assuming an average of two persons per vehicle, then each pedestrian requiring 10 sq.ft. on the sidewalk, will, as a motorist, require 135 sq.ft. in the traffic space. Assuming that nothing but private passenger automobiles are to be used and that the full capacity of two 15-ft. sidewalks is to be balanced by a roadway of equal automobile capacity at two persons per car and there will be needed central traffic space of 198 ft. Adding two 8-ft. parking strips and two 15-ft. sidewalks would make up a total right-of-way of 244 ft.
>
> On the other hand, passengers in bus, street car and rapid transit train occupy only 5 to 10 sq.ft., or reasonably comparable to the space requirements of the pedestrian. While the pedestrian and the street car passenger occupy about the same square footage of street area as formerly, the average motorist requires 13½ times as much space as either. If, in providing for future transportation, the automobile is to be regarded as a permanent factor, then the old standards of street and highway width are obsolete, and new ones must be adopted.

The answer is not to be found in increased speed, for it has been demonstrated that as the speed increases the distance between vehicles must be increased for safe operation. A speed of 15 to 20 m.p.h. gives the maximum movement of traffic through any given traffic lane.

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To provide road area to accommodate the ever-increasing demands or needs of the motorist is beyond the financial ability of any city. The cost would be staggering, so if increased transportation is required it must be mass transportation, bus, street car or rapid transit, overhead or underground.

The natural course of events is quite clear. Students of urban traffic problems are turning to several obvious things. First, increasing restrictions on the use of the roadway, especially in congested districts, for the storage or parking of privately owned automobiles used for the transportation of persons. Second, the routing of privately owned automobiles used for passengers (not freight) so that they will not interfere unduly with mass transportation. Third, creation of new roadways and widening and extension of others without street car tracks for use of privately owned automobiles where the cost of such improvement is not prohibitive.

All signs point to the need for more and better mass transportation. The much abused street car will be increasingly needed by the mass of the people. Its usefulness, its cheapness, its dependability has been amply demonstrated. Its need of flexibility is being met by the use of buses. It is a natural monopoly and in its control, subject to proper regulation, should be all the mass transportation in its community because only in that way can the community be best served.

As an instrument in community service it is not understood or appreciated by even business leaders whose employees and customers need and depend upon it daily. It has presented its worst side to the public. Its failures or shortcomings are before our eyes daily. Its difficulties are hidden and unknown. It is hard for a starving man or a starving business to have a best side. Only prosperous businesses are popular. A prosperous business can be fair, even generous to its workers, its customers, its stockholders. A hard-up business is usually in wrong with everybody.

The street car business has dealt fairly with its employees. Not only the hourly wages, but the "real" wages, the purchasing-power wages, have continually increased since 1922. The companies have managed to give fair service to their customers while fighting for a living fare.

The stockholders have been passed by, almost forgotten. The balance for dividends averaged for the country as a whole has been little more than one-half what the Supreme Court of the United States has declared is a fair return upon capital invested in public utilities.

As we consider ways and means of improving the status of the street railway companies so that they may give adequate service and earn a fair return for their stockholders, we are impressed that the part they play in the scheme of things in our daily life is not understood by people generally. When people are not up on a thing they are usually down on it. City officials and legislatures, as a rule, do what they think the people will approve. Now and then they put something over which they think the people won't know about, won't care about or won't clearly understand.

The street railway companies need a back log of informed public opinion, especially on the part of the car riders. The timid manager who grew up in the old school where everything was done quietly, where things were fixed up without public participation, is likely to shy off at the thought of building up public support, through publicity, for his program and policies.

But this plan has worked in every phase of our modern business life. Not many years ago advertising and publicity were left to the crooks and the fakers. Now the crooks and fakers are killed off by the advertising of legitimate business. Study the effects of the advertising of the General Electric Company, the American Telephone & Telegraph Company, the railroads, and notably some gas and electric companies.

Tell the car riders the things they ought to know. Then you won't have to spend so much time on public officials.

Your own employees should be enlightened supporters of your policies. They should be sound salesmen of the street railway companies' cause. My experience teaches me that they need education on this subject as much as the car riders do. The car rider often expects the impossible. If he knew the facts he might be a supporter instead of a critic. Your employees may know the facts, but rarely take the trouble to explain them.

THE street railway companies need a back log of informed public opinion, especially on the part of the car riders . . . Tell the car riders the things they want to know. Then you won't have to spend so much time on public officials.

—ROLAND B. WOODWARD

You have few defenders or advocates because few know how to defend you or advocate your cause. There is more general ignorance about your business than about any conspicuous business in the community. I've never known a man who has investigated your problem who has not been soundly converted to your cause. He is invariably convinced that you are overtaxed, underpaid for what is expected of you and not appreciated as a factor in city development.

What you need is an Al Smith or a Will Hayes as president of a street railway extension university. It is not a job for a mechanic or a conductor; it's a job for a leader, an educator, who has insight into the human elements and courage which comes from the justice of his cause. Under such leadership a campaign of education could be conducted in every city of the state, a campaign that would change public opinion from a liability to an asset. Most people are fair when they understand, but exasperating when they don't understand.

During these lean years you have learned to live economically, learned to go without. This always chastens the spirit. Now you need new confidence, new public support and approval, new prosperity. You have passed the zero hour in the street railway business. The worst is behind you. Mass transportation, which you alone can give, will be more needed and demanded in the future.

If fares go too high the law of diminishing returns will probably operate to your disadvantage. Therefore, you must manage and operate your properties efficiently; you must be freed from unjust taxation; you must fight the cause of the car rider; you must educate the public; and finally you must remember that confidence in the public and courteous service to the public in turn builds up confidence in the company and consideration for its rights.

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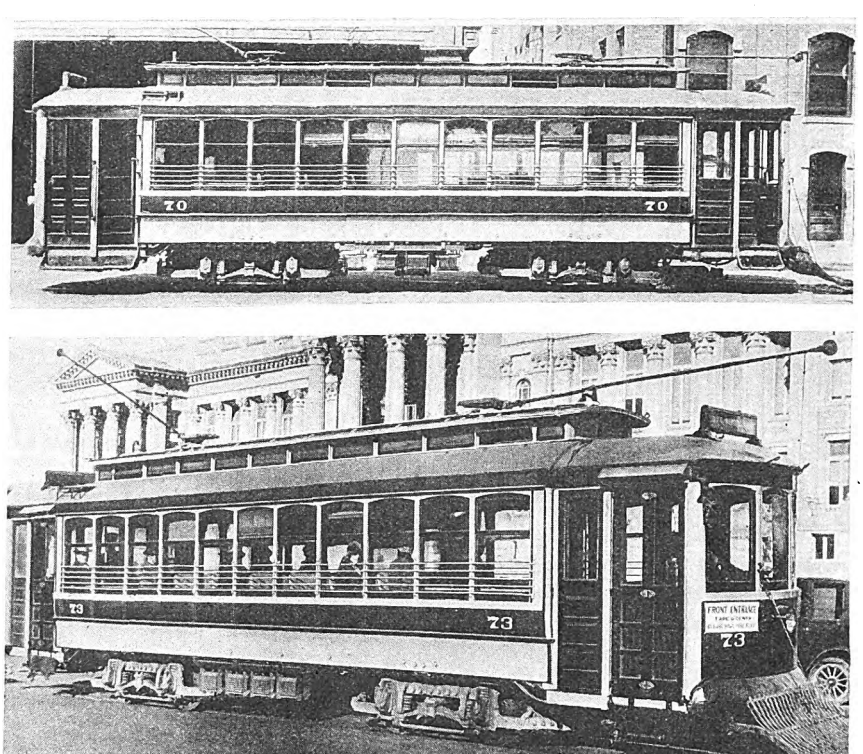
How a Small City Property Was Resuscitated

By the installation of improved cars, the use of merchandising methods and a slight increase in its fare, the Pueblo Electric Railway, which operates in a city of about 50,000 inhabitants, was saved from abandonment

IN THESE days of intensive automobile competition some electric railways conducting purely a local business in small cities have had to abandon their track. There was no doubt in most, if not all instances, that they were performing a needed public service to a large proportion of the community, but with increased costs, restricted fares and no gain in passengers they were unable to make both ends meet. Experience of the Southern Colorado Power Company, which operates the Pueblo traction system, shows that even for railways in cities of from 50,000 to 60,000 there is hope. By co-operation with the public a program was adopted which saved the road for continued usefulness.



At top, 16-ton double-truck car with end entrances and exits before conversion Lower view, the same car after conversion for one-man operation

In 1920 the number of revenue passengers carried by the Pueblo line amounted to 9,201,474. By 1925 it had decreased to 6,947,494, a loss of 24 per cent in five years. In November, 1919, the fare was increased from 5 to 6 cents for three years and later the 6-cent fare was renewed for a like period but under conditions which provided it should revert to 5 cents in 1925. Birney one-man cars were in use on a few outside lines, but a city ordinance provided that all other street cars should be operated by two men.

By the fall of 1925 it was obvious that radical steps would have to be taken to save the service and the following program was decided upon:

1. To ask for a change in the ordinance so as to permit one-man car operation in all parts of the city.
2. To obtain an increase in fare to at least 7 cents.
3. To remodel the double-truck two-man cars for one-man operation.
4. To increase the mechanical efficiency and speed of the cars, if possible; to improve their outside and inside appearance and make them more attractive and comfortable.
5. To apply merchandising methods to offset as far as it could be done the decrease in traffic due to the natural increase in automobiles.
6. To accomplish all these results without affecting adversely the existing good public relations and to increase the friendly relations of the public as much as possible.

It is not necessary to go into all of the details by which this program was carried out except to say that it was accomplished with the approval of the authorities and citizens of Pueblo. The results are shown in the detailed report of the company for the year ended April 30, 1926 and 1927, given in the accompanying table. The purpose of this article is primarily to tell of some of the improvements and economies introduced, so that other companies similarly situated may understand the methods that have proved satisfactory in Pueblo.

Eleven of the 33 passenger cars of the company were of the standard Birney type. The 22 others were double-truck cars, sixteen with side entrance and exit and six with end entrance and exit.

During 1926 and up to July 1, 1927, nineteen of the two-man cars were remodeled to provide them with front entrances to fit them for one-man operation. They were equipped with the latest safety car control equipment, interlocked doors and steps, treadle-operated exit door, etc. While not all cars have been changed over yet, the rehabilitation mentioned represents 57 per cent of the passenger cars owned and 82 per cent of the passenger cars normally operated. Colored destination lights were used to indicate the three main routes operated.

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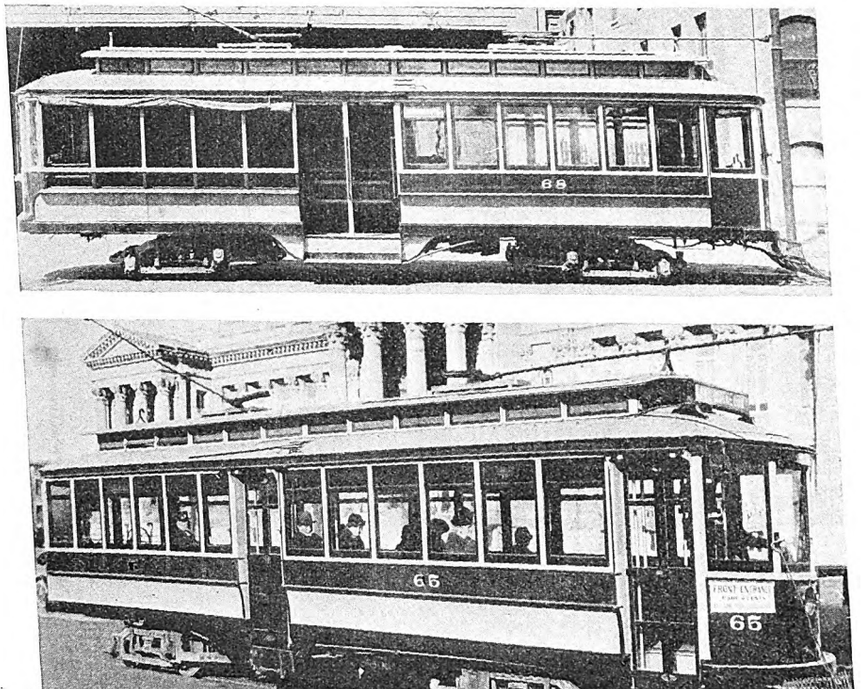

At top, 16-ton, two-meter, double-truck car for two-man operation, as in use in 1925. **Lower view, the same car after conversion to one-man operation and equipment with four motors instead of two**

The new rate of fare established by the ordinance secured was 7 cents cash and fifteen tokens for $1. Continued effort was made to increase the sale of tokens, as using them in change meant a saving of time to the operator, as well as of money to the patrons. Arrangements were made with the drug stores to sell tokens without extra charge, and a special campaign was carried on in which token holders were given free with each dollar's worth of tokens purchased. Full fares paid by tokens for the year ended April 30, 1927, showed an increase over that of the previous year of 116 per cent.

Newspaper advertising was used freely, advertising cards were carried in the interiors of the cars and the front dashers carried signs, usually with wording of a civic nature and some reference to the advantages of riding the cars.

Operators were instructed that they were primarily salesmen, selling rides to the public against keen competition of private automobiles. To avoid dissatisfaction among patrons who might pay their fares by inadvertently dropping more coins in the fare box than necessary, the operators have been provided with excess fare slips. These carry a notice that the operator himself cannot return the excess money, as it would make him short with his fare box, but the slip can be presented at the office and the excess money will be returned. The operator punches a number on the slip indicating the number of cents overpaid and signs his name to it.

During the 1926 State Fair, which was held in Pueblo, the company entered a float representing street car transportation and received the third prize awarded.

Among the methods of improved maintenance in rolling stock adopted were the following:

Overhauling car bodies, trucks and motors on a mileage basis.

Turning axle bearings from individual fit to the axles, which gives perfect gear and pinion clearance and greatly reduces the noise.

Keeping each pinion paired with its gear for the life of the pinion.

Swedging worn carbon brush-holder boxes to restore the brush clearance to standard.

Replacing old type brush-holder springs with new type.

Making new field coils of flat copper to replace the old type wound with round wire.

Installing spring cushions between field coils and motor bearings to keep the field coil from vibrating and to take up any shrinkage of the coil which may occur.

Pit grinding of flat wheels.

Hot dipping and baking of all armatures during regular overhaul; also rebanding and building up between armature coil and band of all armatures showing any looseness of the band.

Hot dipping of all newly rewound armatures and temporary banding while hot with wood strips between the coil and the temporary bands, then baking and permanent banding.

In its track maintenance, it has developed an ingenious method which has afforded considerable saving. When a rail joint gets low there is always a certain amount of wear on one end of the angle bars and formerly these bars were discarded. Now the joint is raised to a level and the worn part calipered and built up by means of the electric welder. Then it is ground to a perfect fit and the old angle bars replaced.

The company has found this method better than using new angle bars because it is possible to adjust the fill and grind both the rail and angle bar, thus making a fit far better than if the old angle bar was replaced with a new one.

EARNINGS AND OPERATING EXPENSES OF PUEBLO RAILWAY SYSTEM, YEAR ENDED APRIL 30

	1927	1926
Passenger revenue, cash fares	$396,594.68	$397,560.41
Special car revenue	50.00	.....
Miscellaneous transportation revenue	47.45	161.43
Total earnings from transportation	$396,692.13	$397,398.98
Earnings from other railway operation	2,011.10	1,983.32
Total railway earnings	$398,703.23	$399,382.30
Recapitulation of Expenses:		
Operation	$197,366.31	$222,543.61
Maintenance	77,762.19	75,953.21
Taxes	46,927.14	51,423.01
Total all expenses	$322,055.64	$349,919.83
Net earnings	76,647.59	49,462.47
Per cent operating expenses to gross earnings	80.8	87.6
Operating Expenses:		
Superintendence of way and structures	$1,953.45	$1,820.00
Maintenance of track and roadway	20,111.74	24,113.78
Other maintenance of way	169.38	830.75
Poles and fixtures	2,243.93	1,049.08
Distribution system	3,284.82	2,909.45
Buildings, fixtures and grounds	442.67	0.87
Total way and structure maintenance	$28,205.99	$30,723.93
Superintendence of equipment	$259.97	$240.24
Cars	31,695.16	28,299.61
Electric equipment of cars	14,047.75	12,061.67
Miscellaneous equipment expense	401.50	1,321.19
Total equipment maintenance	$46,404.38	$41,922.71
Total cost of energy	19,971.02	20,768.07
Superintendence of transportation	$13,301.33	$12,636.64
Passenger conductors, motormen, trainmen	122,176.75	141,364.08
Miscellaneous car service employees and expenses	8,065.12	7,904.72
Carhouse employees and expenses	7,406.77	6,860.98
Signal and telephone and telegraph systems	445.92	445.92
Other transportation expenses	85.11	81.08
Total expense conducting transportation	$151,481.00	$169,293.42
Total kilowatt-hour energy	4,823,548	4,529,474
Cost per kilowatt-hour	$0.414	$0.459

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While the passenger revenue in 1927 showed a slight falling off from that in 1926, the outlook is that the street railway will be called upon to provide greater service than in the past to the public. This is not only because of the constant growth of the city, but because increasing street congestion has emphasized the need of restrictive ordinances on parking in the downtown streets. An ordinance recently passed on this subject provides no parking in the downtown section along any one block in which a street car makes a regular stop, and parking in the other downtown districts, including side streets, will be limited to one hour. Formerly, parking was practically unrestricted.

Small Property Perfects Safety Methods

Tide Water Company of Wilmington, N. C., has won two prizes for excellence in safety precautions. Its methods are detailed

IT WAS not through a spasmodic effort that the Tide Water Power Company of Wilmington, N. C., earned the Anthony N. Brady medal given in January for notable progress in safety and sanitation by railway companies operating less than 1,000,000 car-miles per year. The company has a long and consistent record of safety effort. In fact, it was the winner of the Fitkin railway safety trophy in the safety contest conducted in Sept. 1926. This contest was open to all of the National Public Service Company's railway properties.

The Tide Water Power Company and its subsidiary, the Coast City Transit Company, operated a total of only 959,119 vehicle-miles during the year ended Dec. 31, 1926. The Tide Water Company owns 33.6 miles of single and double track in Wilmington, N. C., and vicinity. It also owns an 11-mile suburban line serving Wrightsville Beach and intervening territory from Wilmington. Passenger service in the city is given entirely by safety cars. The Coast City Transit Company operates bus lines and feeders to the car service from the outskirts of the city.

The suburban line has a decidedly seasonal traffic. In the summer 22 large double-truck cars are required to carry the enormous number of excursionists, whereas during the off season three cars are sufficient. Summer also brings a tremendous increase in freight, express, car load and package shipments. New men must be trained each spring in advance of the season, so that ample and safe transportation may be assured. All this means, necessarily, that there will be a considerable increase in the number of accidents.

On the other hand, its ownership at the beach of a large bathing pavillion has brought the company in contact with life saving methods. Life guards are employed there, and life saving demonstrations are held on the beach at regular intervals. Company employees have also made a study of the prone pressure method of resuscitation. Two hospitals in Wilmington have requested a demonstration of this method by the company's men before their doctors and nurses. Incidentally, the company's general manager was elected chairman of the committee on first aid in life saving for the Wilmington Section of the Red Cross. Besides instructing every employee in the prone pressure method, the company has an inhalator and an approved gas mask as additional aid in resuscitation and rescue work. This equipment is available night and day not only to all departments of the company, but to the public as well.

It would be impracticable to list all of the safety methods followed by the company, but a few resulting from original ideas by employees follow:

1. Placing of "no parking" signs on company property along the right of way to reduce the possibility of accidents with automobiles.
2. Placing of crossing signs, warning both trainmen and public of dangerous points.
3. Removal of nails and tacks from all working poles on the company's system, and the taking of proper steps to prevent the use of the poles by sign posters.
4. Establishment of an electrical school of safety during the winter and spring. This was open to employees on their own time and was well attended.
5. Discouraging talking to motormen on the cars.

Establishment of Safety Council

Safety activity on the Tide Water property heads up in the safety council, of which the general manager is chairman. The personnel of this committee, with the exception of the department heads, is changed yearly. The safety council meets monthly in the general manager's office. At these meetings each member is called on to report individually. Suggestions are received, discussed and acted upon. The accident record of the previous month is reviewed. Each accident is discussed in detail. The record is compared with that of other months. The trend from year to year is noted. Causes are examined carefully, and steps are initiated to prevent the recurrence of accidents.

Since the initiation of the safety suggestion plan in 1920, and up to Dec. 31, 1926, 606 safety suggestions were submitted. Nearly all of them were found feasible and put into effect.

At the close of these meetings an inspection committee is appointed from the men present and sent out to make a detailed inspection of the property. This committee submits its written report to the safety supervisor. Suggestions supplied by the men are included in the report. The trainmen have become so interested in the safety work that they take up safety questions in sessions of their union.

Bonus Plan in Force

A bonus plan rewards trainmen for safe operation. The rewards are made on a monthly, quarterly and yearly basis. Many of the men have made perfect records and secured the maximum reward for as many as three consecutive years. Thus, in 1926, of the 48 trainmen eligible, 30 per cent held perfect records. In other words, during the year, they operated cars over the system without a single accident charged against them. Only one man on the staff failed to receive some award.

The bonus plan also extends to the bus drivers and to the regular drivers of all of the company's autos and trucks. The bonus schedule follows:

$1 for each no-accident month	$12	possible in year
$1 for each no-accident quarter	4	possible in year
$5 for perfect record for the entire year	5	possible in year
Total	$21	possible in year

If an employee has an accident, he loses his cumulative bonus but can start over again for the rest of the year.

The cost of the bonus system during 1926 was $516, or about 1 per cent of the wages paid to the trainmen.

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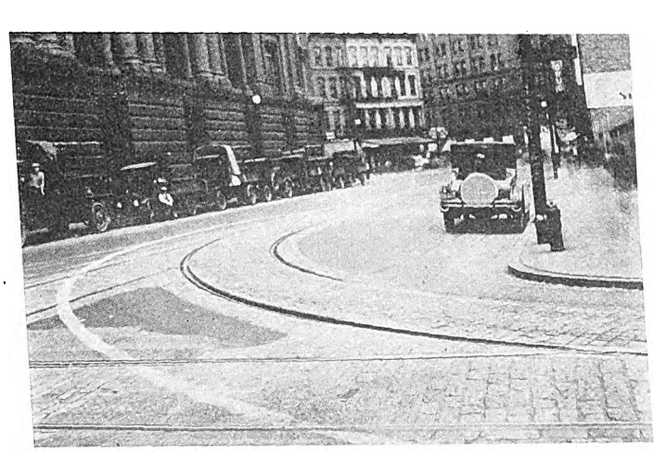
Pittsburgh Protects Passengers and Pedestrians

Railway adopts railed safety zones, extensive system of pavement marking and other means for reducing accidents to patrons and other users of the street

ON THE Pittsburgh Railways the campaign for safety is regarded as of the greatest importance. With the reorganization of the company a safety committee was formed to head up the movement, and a great many steps have been taken to reduce street accidents. Roughly, they may be divided into improvements on the car to make it more conspicuous and easily controlled, protection for boarding and alighting passengers, warnings on the street of dangerous points because of the operation of cars, and improvements in the track from a safety standpoint.

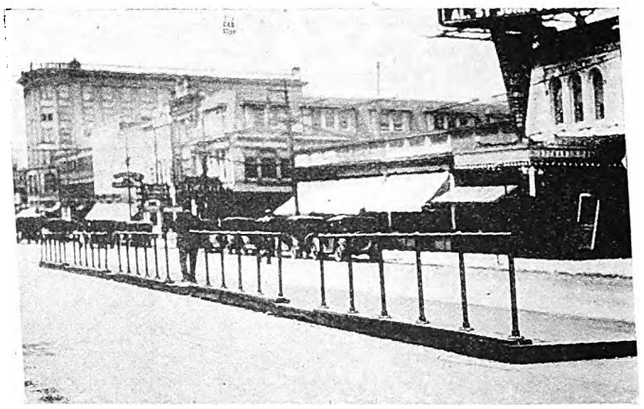
Many of these improvements on the cars were possible because during 1924, 1925 and 1926 many old cars were retired and new cars purchased. As these new cars were equipped with modern brakes and were up to date in other respects only what might be called the more unusual safety precautions will be mentioned here.

One of these was the selection for the car body of a light color, chrome-orange, instead of maroon or dark red, in order to give greater visibility. Stop lights were installed on the rears of all cars, operating from the control mechanism, so that when the car was slowing down preparatory to making a stop, the stop light was illuminated. Projecting fenders were replaced with automatic life guards. Window wipers were installed as were also rear sanders so that the motorman could sand the rails in case his car should begin to slide backward on a heavy grade. All controllers were fitted with a dead-man's attachment. When emergency stops are made, the doors of the car are automatically opened. This tends to reduce to a minimum the confusion of passengers in the event of a collision. The air brake handle has been



The distance taken by car overhangs on curves with a short radius is marked distinctly on the pavement

fitted with a device by which the operator can sand rails and apply air without removing his hand from the air brake handle. The pet-cocks on all air reservoirs have been changed so that they can easily be opened or closed from the outside edge of the car by means of a handle and cannot be opened accidentally. Automatic air brakes are applied to trailers.



This type of loading platform is used in Pittsburgh where the street is of sufficient width

The precautions for boarding and alighting passengers consist largely of island platforms which have been introduced at a number of points. Where the street is of sufficient width, a special railed platform or guarded safety zone of the type shown in an accompanying illustration, has been installed.

On two routes, there were points where there was a possibility of passengers alighting from cars and stepping directly into the path of moving vehicles on a high-speed thoroughfare parallel to the track. In one such case platforms were constructed so that passengers could alight from what would ordinarily be the wrong side of the car in order to keep them off the highway. In another case, the company has approved plans for shifting the track at stopping points so as to provide room for loading and unloading platforms.

At locations where hazards exist from the overhang of cars passing around curves, the company co-operates with the city in painting the pavement so as to indicate the extent of the overhang. This work is performed under the jurisdiction of the traffic department of the city, the company assuming the expense incidental to the employment of one painter. At dangerous car turns, a warning is painted on the street, "Watch Car Turn."

At a few points within the city where the car platforms formerly overhung the curb when the car was passing around the curve, permission was secured to cut back the curb so as to reduce the possibility of pedestrians being struck by the car. On interurban lines obstructions to vision at road crossings have been cleared away so far as was possible. The attempt has been made to give a clear view to an approaching vehicle from a point approximately 40 ft. from the car tracks and to a street car operator 400 ft. from road crossings. Where necessary, the purchase of property has been authorized to attain this result. Up to 1926 four such locations had been remedied. Block signals and automatic crossing signals have been introduced to a considerable extent on the interurban lines.

In the track the principal safety precautions have been positive-locking electric track switches and electrically operated derail switches at railroad crossings.

An article in regard to the latter appeared in the issue of ELECTRIC RAILWAY JOURNAL for June 27, 1925, page 1008. Since that time the use of these derail switches has been extended.

The purpose of the addition of the locking feature to the electric switch is to prevent "switch-splitting" during the movement of a car over the switch. It has proved successful.

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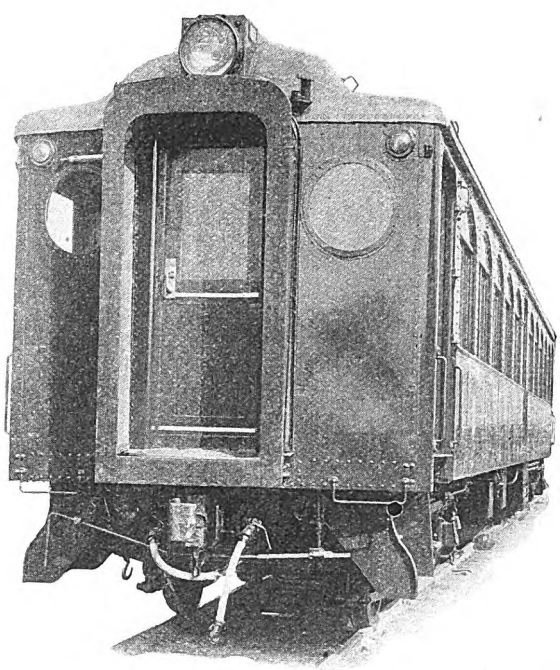
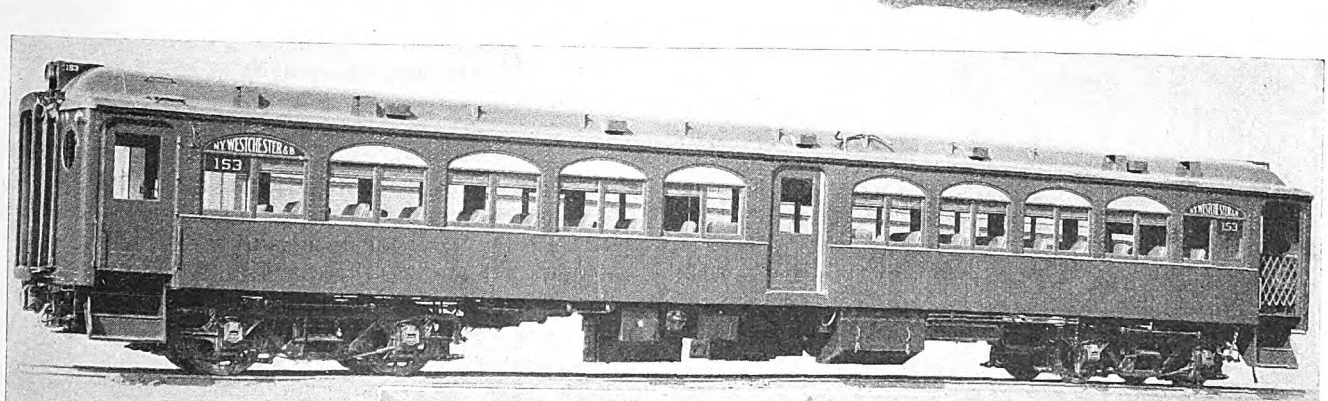
Single-Phase Equipment

for New York, Westchester & Boston Railroad

Extension of the company's lines and increased traffic resulted in order for 30 additional cars

By Walter H. Smith
Equipment Engineer Reading Railroad*





One of the latest New York, Westchester & Boston Railroad cars

The train line and bus line receptacles may be seen in the end view directly beneath the body and inside the step line. The interior is roomy and cheerful, cross seats being used except adjacent to the door. Flush platforms are the rule except at a few little-used stations.

INCREASE in passenger traffic and extension of lines made necessary the purchase of additional equipment by the New York, Westchester & Boston Railroad, New York, N. Y. Recently three orders were placed, each for ten cars, making a total of 30. When these are all received the company will have 80 all-steel passenger motor cars and five all-steel trailer cars.

The road is a four-track line starting from the Harlem River in New York City and continuing north to just beyond Mount Vernon where it diverges into two double-track lines, the one on the west continuing to White Plains while that on the east is now being extended from Mamaroneck through Harrison to Rye. Further extension to Port Chester is contemplated in the near future. The system at present comprises 26.62 route-miles with a total of 83.10 miles of electrified track.

Following previous practice each of the new cars has two 175-hp. (hour rating) Westinghouse type 409-B single-phase, 25-cycle series motors mounted on one truck. The Westinghouse type AB (automatic acceleration, battery operated) multiple-unit control system is used, permitting a train of from two to ten cars to be operated from the master controller of any car. Usually trains consist of motor cars only, but, occasionally, during rush hours, a train of six or more cars may include one trailer.

Each car is equipped for double-end operation and each motor car has two pantographs of the sliding shoe contact type, raised by a spring and lowered by air. There is a self-adjusting action so that the shoe moves to conform to the lowest trolley wire height. Each pantograph will collect current from the trolley at 11,000 volts and is suitable for speeds up to 60 m.p.h. The gears are of the flexible type with a 25:68 ratio.

The new cars are designed to operate in multiple with those in service although the main power circuit requires only six unit switches arranged for preventive coil transi-

*Formerly railway equipment engineer Westinghouse Electric & Manufacturing Company.

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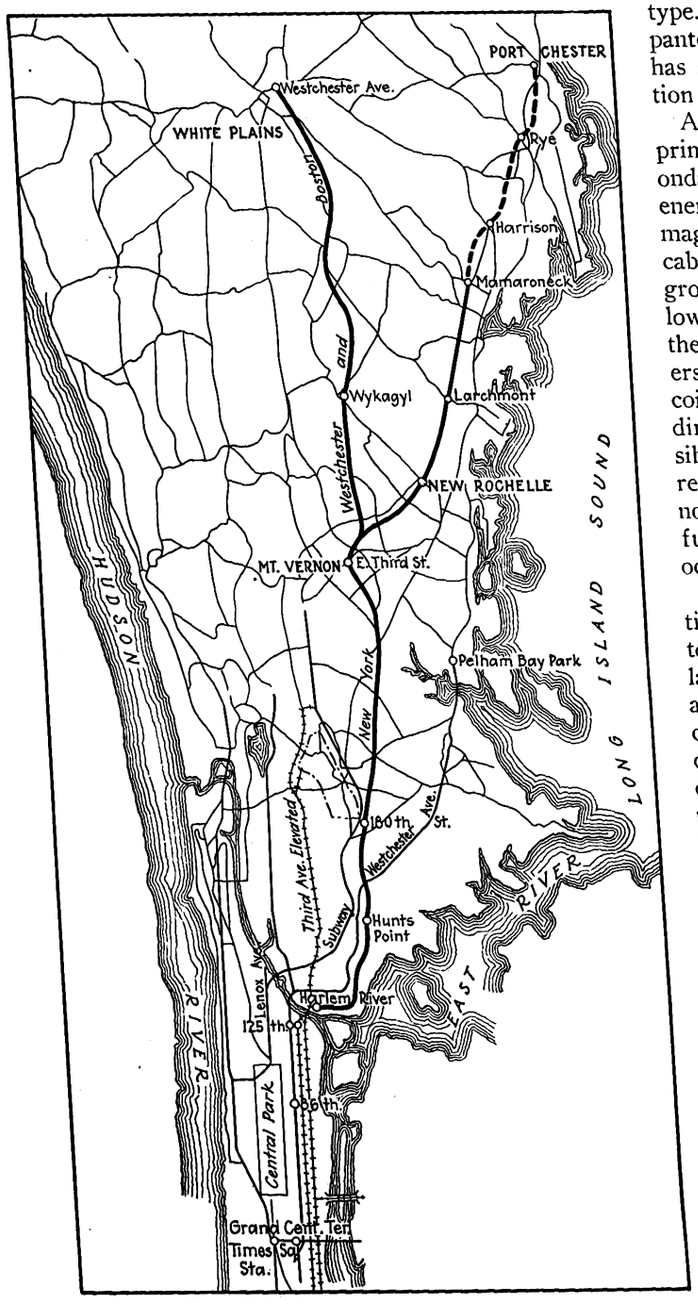

The New York, Westchester & Boston lines run from the Harlem River to White Plains and Mamaroneck, an extension being made to Port Chester

tion, whereas the power circuit on the old cars requires eight unit switches with grid resistor transition. Any two cars with different systems of control may be operated in multiple if designed for the same rate of acceleration and placed under the control of a motor current limiting relay, provided that the tractive efforts in pounds per ton at the rims of the driving wheels are approximately equal, the free running speeds are equal when the motor performance curves are reached, and the balancing speeds are equal on level tangent track. These conditions are met as the old and new cars weigh practically the same and the motors are duplicates electrically.

The high-tension cable on the roof of the car is carried on porcelain insulators. The cable leading to the main transformer is run in a metal conduit and is entirely enclosed from the roof to the casing of the transformer.

The main transformer is of the two-circuit, air-blast type. The primary winding is connected between the pantograph and the track rails and the secondary winding has suitable taps to give the required voltages for traction motors and auxiliary equipment.

Around the cable leading from the pantograph to the primary winding is a small series transformer, the secondary of which connects to the coil of a relay which will energize the actuating coils of the pantograph "down" magnet valves, if there is excessive current in the trolley cable such as would be caused by a short-circuit or ground. Then the pantograph on the affected car will be lowered automatically after power has been cut off from the line by the opening of the transformer station breakers. The relay disconnects the "trolley-down" magnet coils from the control train line and energizes them directly from the storage battery which makes it impossible to raise the pantographs again until the relay is reset manually to its normal position. The relay does not operate under normal overload conditions. Its function is to clear the line after a break-down has occurred.

The main power circuit requires but a single preventive coil for transition from one tap on the transformer to another during acceleration. The coil consists of a laminated, iron structure assembled around a winding and clamped between cast end frames. Its middle point connects to the traction motor circuit and the end leads connect through the switch group to points on the secondary winding of the main transformer. It is possible to secure five accelerating points with four unit switches. The circuits are so arranged that each half of the preventive coil is required to carry one motor current on all accelerating and running points. In the accompanying partial schematic diagram showing switches *M*, *A1* and *P* closed on the first point it will be seen that the current is divided equally between the two halves of the preventive coil, neutralizing any choking effect. This connection will give a voltage on the motors from *M* to *A1* on the transformer. If the current at start is *I*, then the current in each half of the coil will be *I/2* with no magnetizing current in the coil and consequently no iron loss.

In switching from one point to another, acceleration switch *P* in Section A of the diagram must be opened before switch *A2* in Section B is closed. During the time from the opening of *P* until the closing of *A2*, the entire motor current must pass through one side of the coil only, and unless the coil is properly designed there may be a considerable choking effect. A properly designed coil, however, minimizes the choking and since the changing of switches may be made to take place in some four cycles the effect is negligible. In passing to this second point with switches *M A1*, and *A2* closed, the voltage across the motors will be *M-A1* plus one-half *A1-A2*. The current in each half of the coil will still be *I/2*, but superimposed on these two currents on this point is the magnetizing current I_m of the coil necessary to produce a voltage equal to that between the transformer taps *A1* and *A2*.

It will be seen in passing to the third point, shown in Section C of the diagram, that it first will be necessary to open switch *A1* before reclosing *P* for the second time. While this switching is taking place the entire motor current again must pass through one-half of the coil for an instant, after which the current in each half of the coil will be one-half with no magnetizing current. The voltage on the motors on the third point will be *MA2*. The transition to other points is a repetition of the above. On the fifth or final running point there

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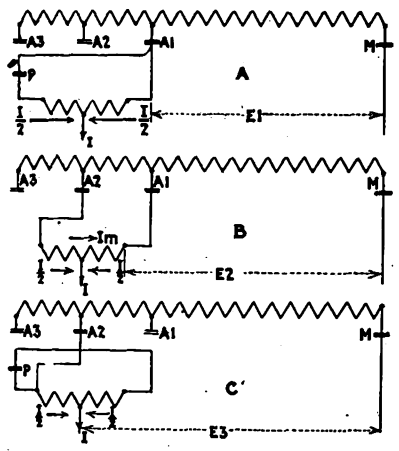


Partial schematic diagram of power circuit, showing use of the preventive coil

is no magnetizing current in the preventive coil. This arrangement provides maximum efficiency during both acceleration and running. The six electro-pneumatically operated unit switches required are assembled in a group on a common frame enclosed by sheet metal covers. The individual switches, blowout coils, actuating air cylinders and magnet valve brackets may be removed independently. Included with the switch group and mounted on the end frames are one sequence switch, one current limit accelerating relay, two overload relays, and two individual motor control cutout switches.

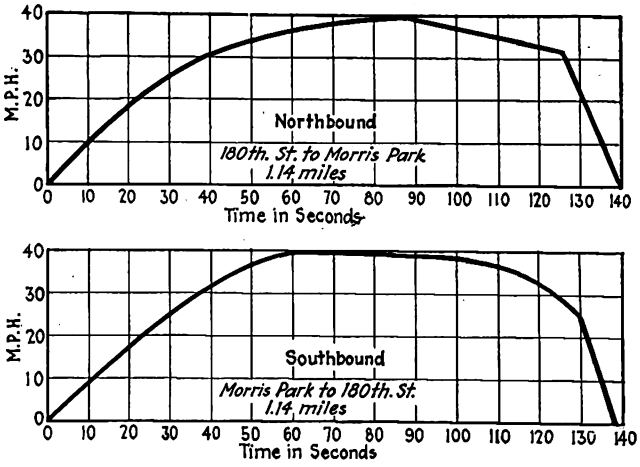
The current limit relay determines the rate of acceleration of the car. It controls the movement of the sequence switch drum which, in turn, regulates the closing and opening of the individual switches for proper acceleration. The rate of acceleration may be changed by changing the relay setting.

Incorporated with the current limit relay is also a shunt coil which, if energized by cutting out either of the traction motors, automatically gives a reduced relay setting and the car may proceed with the remaining motor but with reduced acceleration.

The sequence switch controls the closing and opening of the unit switches in the proper order for acceleration. It also makes possible positive interlocking of the control system used on these new equipments, which provides against closing of two conflicting switches at the same time. The closing circuit of the incoming switch is interlocked through the "out" position of the outgoing switch, as distinguished from negative interlocking in which the holding circuit for the outgoing switch is opened by an interlock in the "in" position of the incoming switch.

Reversals Interlocked

The single reverser is interlocked with the power circuit so that the switches cannot be closed and power applied to the main motors unless it is in its correct forward or reverse position as indicated by the master controller. It also cannot be thrown while power is on the motors. The reversing drum is rotated by two air cylinders, compressed air being admitted to either the "forward" or the "reverse" cylinder by two magnet valves. The reverser is suspended from the underframing of the car body between the switch group and motor truck so as to provide for the least amount of cable wiring for the main motor circuits.



Typical speed-time curves, showing performance of the cars between Morris Park and 180th Street in both directions

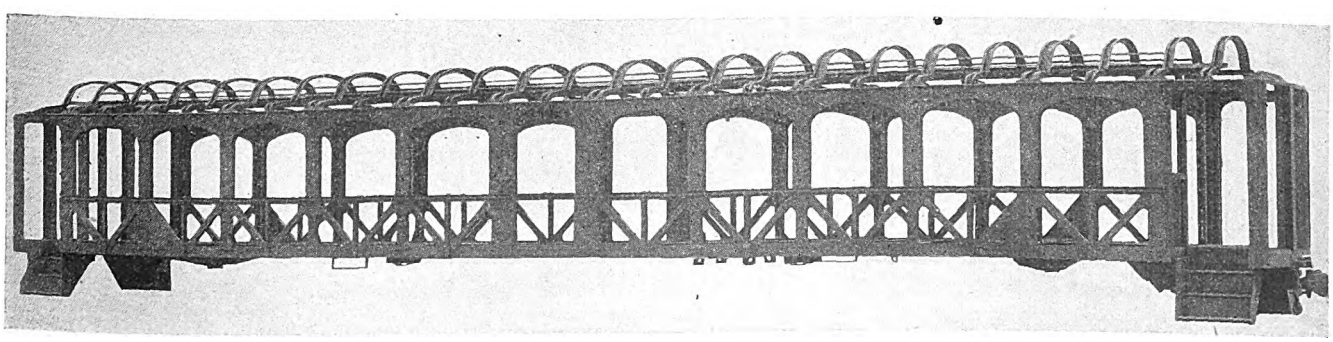
Each car has two drum-type master controllers, one at each end. Moving the handle to the right causes a forward movement of the car and moving it to the left a reverse movement. If the motorman's hand is removed for any cause the handle will return to the "off" position and cut off power.

Each controller also has a control cutout and reset receptacle. The drum for actuating the control train-line wires cannot be energized unless the cutout plug is inserted in the receptacle. This plug cutout is also used for resetting the overload relays through the reset receptacle.

Two push buttons in each master controller actuate magnet valves which govern the admission of compressed air to the cylinders which unlock the pantograph and allow it to be raised to, or lowered from, the running position. The unlocking button has an automatic release, but the lowering button will remain closed until released manually.

The control and air brake train-line circuits between cars are made by jumpers and two twelve-point receptacles mounted at each end of the car. This permits coupling of the train line from either side of the car and without regard to ends. All of the control train line wires are run in one conduit. Three junction boxes provide for the train line and for connections to the individual pieces of apparatus. The train line jumpers are carried in dummy receptacles when not in use.

Energy for operating the magnet valves of the control



The new Westchester cars are built with a rigid steel framing

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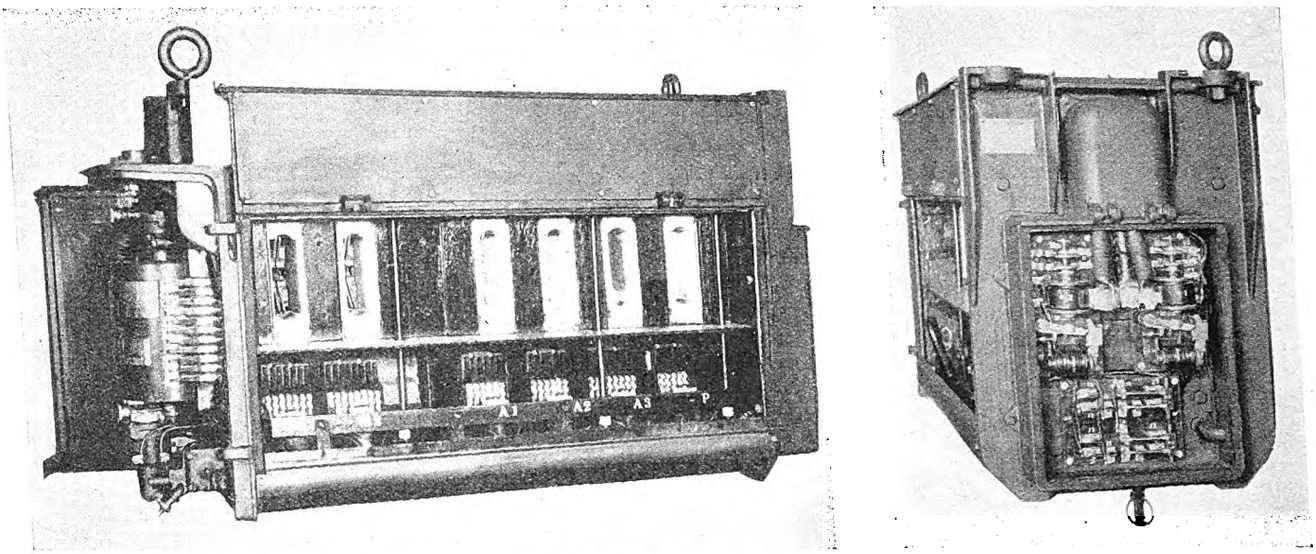


The main switch control group, with the sequence switch and limit relay at the left **end. The view at the right shows the overload relay and motor control cutout switches, which are mounted at the opposite end of the main switch group**

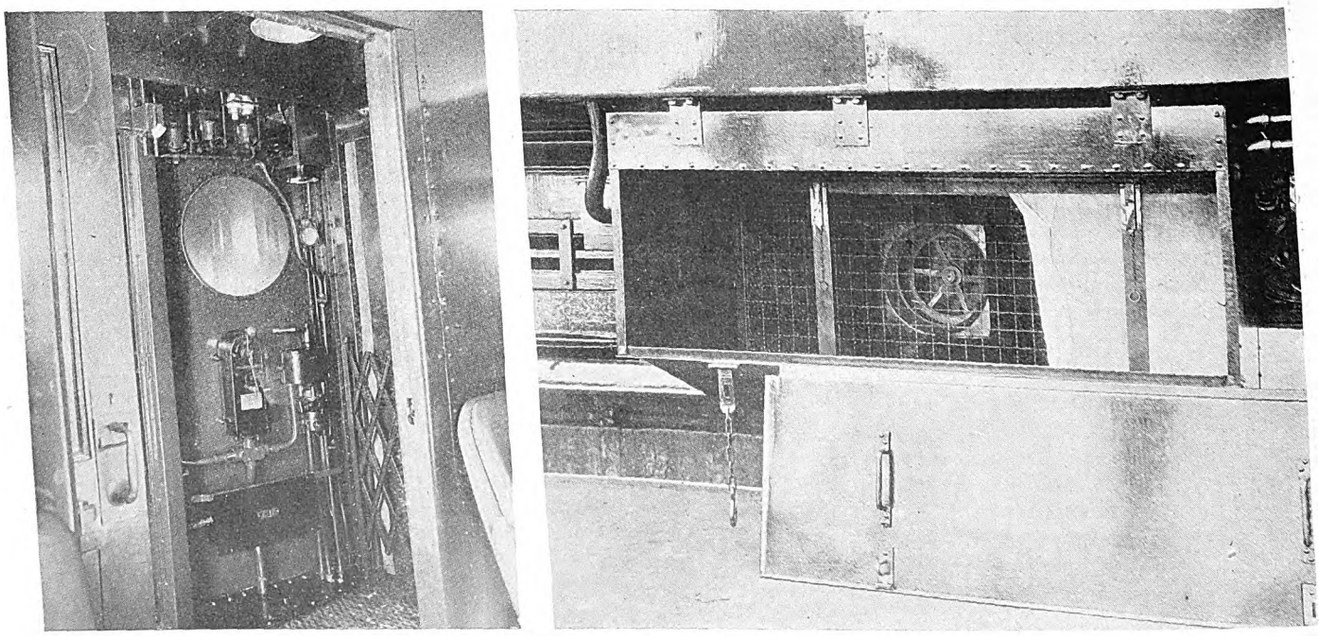
apparatus, the air brake apparatus and the emergency lighting system is taken from a motor-generator set and storage battery at from 32 to 40 volts. The storage battery consists of 25 cells of the Edison B-2-H type connected in series and floating across the motor-generator set when it is running. The battery is rated at 37½ ampere-hours at its normal rate of discharge.

The motor-generator is semi-enclosed, self-ventilated, and equipped with two ball bearings. The motor is a two-pole, three-phase induction-type with a cage rotor, which operates at 110 volts on a single phase. The set is brought up to speed automatically from the d.c. end with current from the storage battery. The generator is a four-pole, shunt-wound machine with two brush arms. A suitable rheostat adjusts the field excitation to give proper voltage on the battery and other apparatus. A battery cutout relay energized from the motor circuit connects the battery to the generator when the transformer is alive and the motor-generator cutout switch is closed. It also disconnects the battery from the generator upon loss of line potential, lowering of the pantograph or cutting out of the motor-generator set.

Duplicate Lighting Systems Installed

The lighting system of the car consists of ten main lamps and ten emergency ones alternating in one row in the center of the car. The main lamps are on a 110-volt circuit supplied from the main transformer, while the emergency lamps operate on the battery at from 32 to 40 volts. The emergency lamps are cut in automatically upon loss of line potential. In addition, each end of the car has two vestibule lamps, two marker lamps, one gage lamp, one headlight, and one car number lamp. All of these are fed from the motor-generator and storage battery.

The ventilating system for the equipment consists of a single inlet over-shot wheel blower, driven by a single-phase series type motor. The wheel is a 15-in., 1,500-



The control compartment of the car indicates the simplicity of the equipment which the motorman must handle. At the right is shown the air intake to the ventilating system. The snow screen is partlyin place

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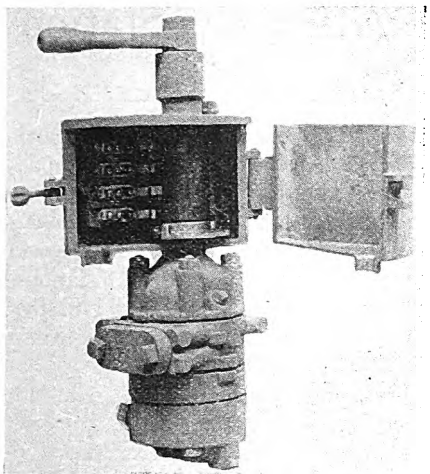


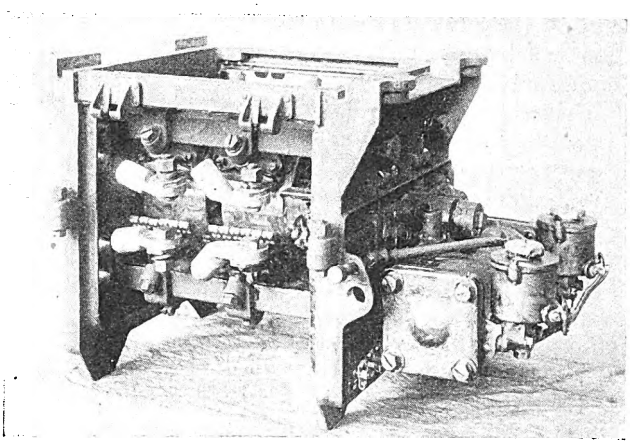
The electromagnetic brake valve. The cover is opened to show the control contacts

r.p.m. Sirocco runner. The blower unit is behind the main transformer toward the trailer truck. The intake is a large sheet metal box on the underside of the car body. It has a snow barrier which is readily thrown in place. The blower wheel casing is bolted to the underside of the channel box center-sill of the car body. The ventilating air to the transformer is blown directly into the transformer casing, while that for the motors is transmitted through the center sill to the motor truck where there are outlets to the motors. These outlets are provided with curved deflectors. The connection from the center sill to the motors is made by means of flexible oil-treated canvas bellows suitable to allow for the maximum truck swing. The ventilating air to the preventive coil is taken from the center sill.

Length over coupler faces	72 ft. 0¾ in.
Length over buffer face plates	72 ft. 7¼ in.
Length over body corner posts	61 ft. 4½ in.
Length center to center of trucks	47 ft. 7½ in.
Wheelbase	8 ft. 0 in.
Wheel diameter (motor truck)	42 in.
Width over side plates	9 ft. 7¾ in.
Height of car from top of rail to top of roof	13 ft. 3½ in.
Seating capacity	80
Weight fully equipped	125,000 lb.

The cars are all steel with full vestibule platforms and center side doors. Flush type station platforms are used on this road, but in order to permit the cars to be operated over a section of the New York, New Haven and Hartford Railroad with low station platforms, the usual coach type steps with trap doors are installed at the ends. Some of the principal dimensions of the new motor cars are given in the table above.

The body underframe consists of continuous rolled steel channels and pressed steel cross members. The center sills are two 8-in., 16¼-lb. channels spaced 14 in. back to back and having a continuous top cover plate securely riveted in place. A bottom cover plate extending from the blower unit to the motor truck completes the ventilating duct to the traction motors.



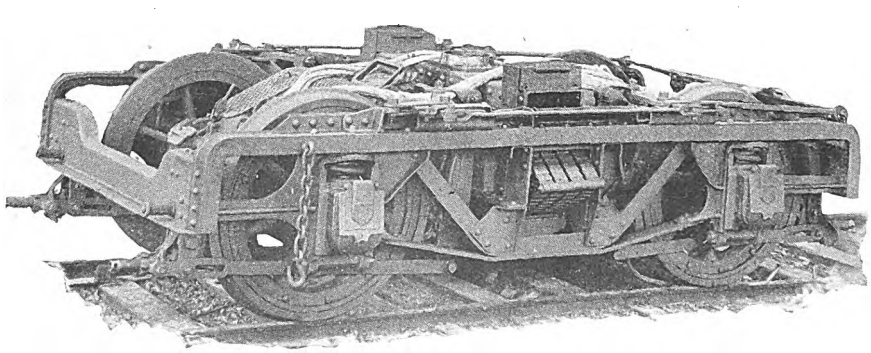
The reverser is air operated and changes all circuits for reversal of motion

Each side sill is a 7-in., 12¼-lb., rolled channel. The vestibule end sills are formed of pressed and rolled members with a ¼-in. cover plate, riveted together and also to the center sills. The body end sills are pressed steel members framed to center and side sills and with both top and bottom cover plates. Single and double cross bearers of pressed flanged diaphragms with cover plates are riveted to the center and side sills. The diaphragms are perforated for air piping and conduit. The diagonal bracings are pressed and rolled members riveted to gusset plates framed to the center and side sills at various points. The body bolster is composed of pressed flanged diaphragm and top and bottom cover plates. A cast steel filler is fitted and riveted between the center sill channels to support the center plate.

The side frame of the car is in the form of an eleven-panel truss, 7 ft., 5¼ in. in height. The bottom member is a 7-in., 12¼-lb., rolled channel. The posts, diagonals, letter board, and top plates of each section are pressed in one piece and the different sections are either welded or riveted together. Channel shaped window posts extend from side sill to deck sill. The side sills and side plates are reinforced across the door opening by special pressed members. There are twenty intermediate posts of pressed steel, which extend from side sills to side plates. The main posts and diagonal braces are riveted to the 7-in. channel side sill.

The Auxiliary Equipment

All the doors are of the sliding type. The vestibule and center side doors are remotely controlled, being opened and closed by National Pneumatic Company Type GS-8E air engines. The center side doors may be opened and closed from either end of the car. The control



This view of the truck shows the extreme compactness of the installation. The truck at the opposite end of the car is a trailer

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circuits of these two doors are also provided with a push-button switch which permits them to be closed by guards standing on the station platforms.

Each car has ten ventilators, located in the roof in two rows. The car heating system consists of 36 Gold Car Heating Company type 405-E, 600-watt, cross-seat electric heaters and two 1,000-watt vestibule heaters. The heaters are of the two-coil type, the main car heaters having one coil with 200-watts capacity and one coil with 400-watts capacity. Nine heater coils are connected in a series. Energy for heating is supplied from the main transformer at 112 volts and is controlled by cutout switches located in a cabinet provided at the motor truck end of the car for the control switches and fuses of all auxiliary apparatus. Each car also has a two-circuit bus line for supplying energy for heating and lighting when the service requires trail car operation.

The brake equipment is the Westinghouse Air Brake electro-pneumatic, schedule AMCE. Brake action is positive at all times, for if the electric control fails the pneumatic control functions without further direction on the part of the operator. Electric control effects an economy in air consumption, necessitating only a comparatively small compressor. The compressor is the XD-2-EG, having a displacement of 25 cu.ft. per minute. The motor is supplied with current from the main transformer at 112 volts. The system is synchronized, so that in train operation each compressor performs an equal share in the work.

The control valve embodies all the modern operating features, chief of which are quick recharge of the brake system, high pressure in emergency, positive and uniform service action and simplicity of control. The control valve automatically performs these functions under the simple guidance of the brake valve, which is a standard rotary valve type with the addition of a suitable electric portion.

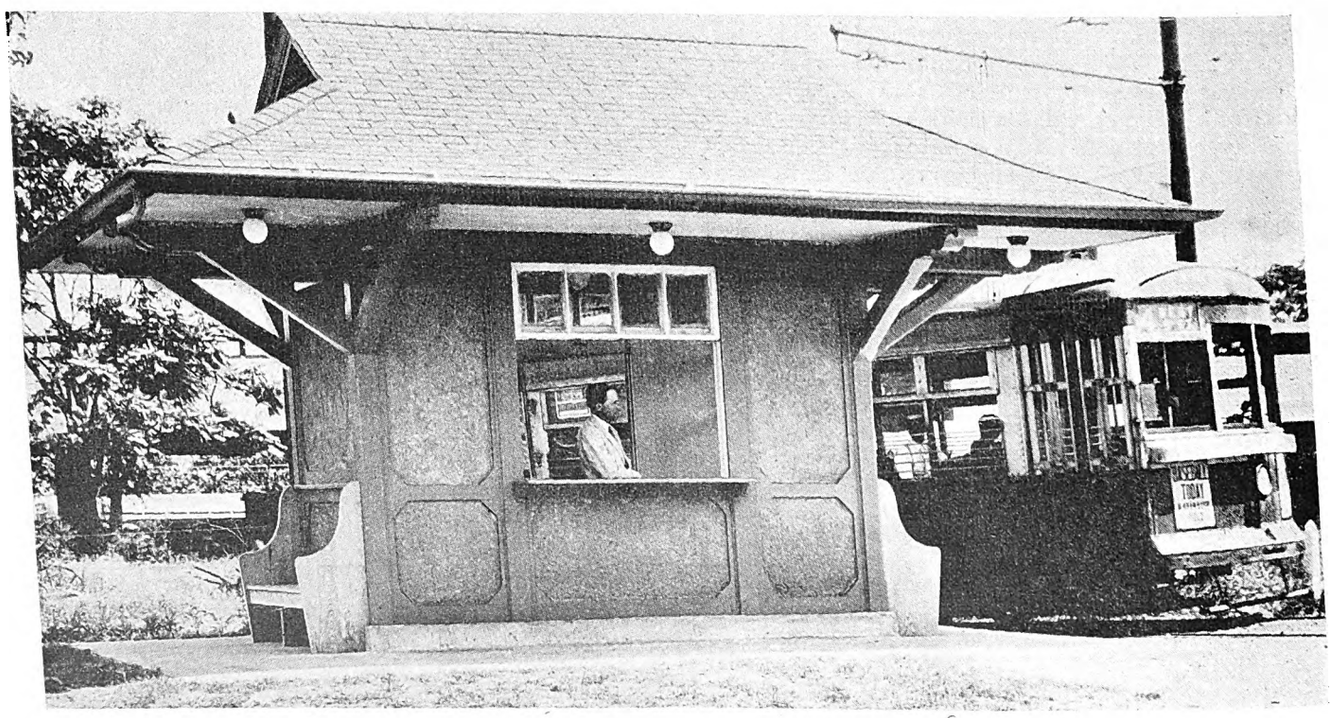
$1,000 Erects Attractive Station at Little Rock

FOR the convenience of passengers at the Rock Island railroad station at Little Rock, Ark., and the people living and working in the vicinity of that station, the Arkansas Power & Light Company has built a combination waiting room and news-stand at the end of its Rock Island street car line. It is the first of several stations of that type which the company plans to build in the loops of other lines. The construction cost was approximately $1,000.

The station is of stucco and frame and is simple but artistic in design. It measures 6x12 ft. and is approximately 15 ft. high. It has a concrete base 16x22 ft. On the exterior of the building there is a sales booth which has been leased as a newsstand for $15 per month, which is regarded as a satisfactory return on the investment. However, in making the agreement, the company provided that the tenant's first duty was that of service to the company and that he should act as its passenger agent at that point. This means that he must be informed on the railway schedules and be courteous to all patrons of the line, as well as sell tokens at the usual rates. He is permitted to store baggage, for which a nominal fee may be collected.

Seats are placed at either end of the building for the comfort of waiting passengers. The waiting room furnishes protection from the weather for passengers, who formerly waited at the railroad station across the street and then were forced to run to catch the car or else take chances on getting wet in bad weather.

The building is situated on the east side of a loop and the cars stop at the end of the waiting room so that passengers may board or leave the car with the least possible exposure to the weather.



The first of a series of combined waiting room and news-stands, erected at the end of an important line by the Little Rock company

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Maintenance Methods and Devices

Oil Is Superior to Grease for Gear Lubrication

By H. S. Williams
Assistant Superintendent of Equipment Department of Street Railways, Detroit, Michigan

MUCH attention has been given to the subject of gear lubrication and the question as to which is the better medium, an adherent or tacky type of grease or an oil. The present construction of gear cases is such that oil cannot be retained as a lubricant. In fact, it is often difficult to prevent the loss of heavy greases. However, the incentive toward developing an oil-tight gear case depends on whether the oil used is superior to grease for this type of lubrication.

With the idea of determining which lubricant is superior for ordinary spur gearing of railway motors some tests were made. Having the test apparatus at hand that was used for the noise reduction committee's study, it was easy to run a series of tests to determine whether there is any difference in the resulting efficiency when grease or oil is used for railway gearing. The test consisted of driving a generator by means of a motor. By measuring the input and output at various speeds, the efficiency was obtained. The efficiencies shown are very low as the generator used was of ancient type. The test was run first with grease, then the gearing was cleaned and the test repeated with oil. The results obtained are thus comparable, as all other conditions except lubricants were identical.

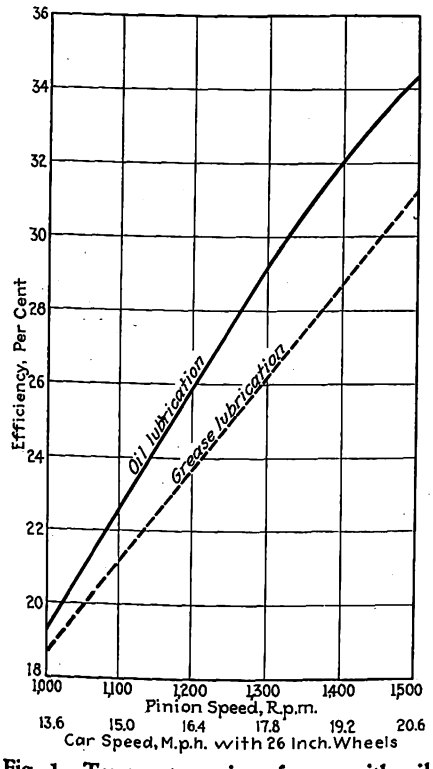


Fig. 1—Temperature rise of gear with oil 5.83 deg. C. With grease 10.35 deg. C. Time for each temperature test 50 minutes.

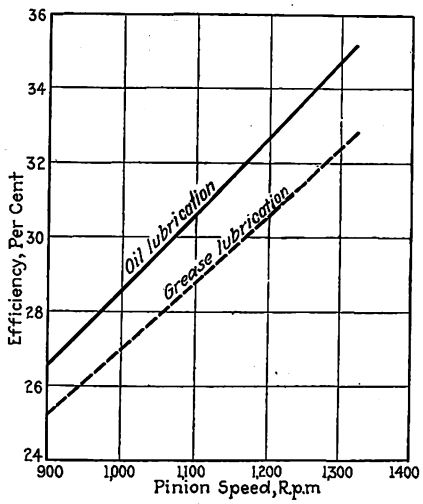


Fig. 2—Comparison of efficiency at different speeds for oil and grease lubrication.

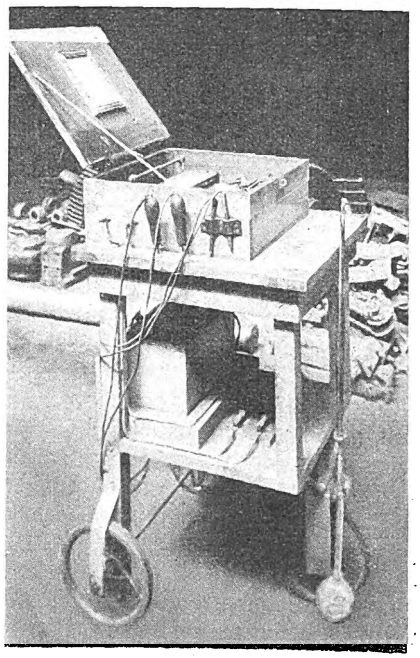
The accompanying graphs show the results. A first test, shown in Fig. 1, was quite conclusive, but desiring to be absolutely sure it was decided to run a check test. In the second test the generator was replaced with another type, so the over-all efficiency is not the same as in the first, but the relative results are similar. Attention is also called to the corroborative evidence given by the temperature rise that was obtained in the first test.

From these tests I believe that proof is established that oil is much the superior type of lubricant. It is a simple matter to figure back from these data and see approximately what it costs to stick to grease as a lubricating medium. The word "approximately" is used advisedly because, as pointed out before, the present gear case invites the entrance of grit and dirt, so if energy loss is figured correctly there is still the element of gear life to be added.

It is my firm belief that gear cases of the future must be made oil tight. With the present tendency toward new design of motors, this can be accomplished quite readily.

Portable Electrical Testing Machine

FOUR portable testing machines mounted on rubber-tired wheels are used by the Georgia Power Company, Atlanta, Ga., for detecting poor connections, improper winding of fields or short-circuited turns and to determine which fields need to be removed and repaired. This testing machine, which was described in the brief of the company submitted in competition for the Coffin Award, has proved of great value in reducing detentions to service and increasing the efficiency of the electrical equipment. Necessary parts are mounted on two platforms of the framework. Covers provide easy access, while they protect the equipment and keep it dust-proof.



Field testing equipment

This machine has been a large factor in reducing armature and field troubles. The following information shows some of the beneficial results:

Location of trouble	1922	1923	1924	1925	1926	First Four Months 1927
Armature	260	280	187	147	64	17
Field	141	98	85	75	23	0

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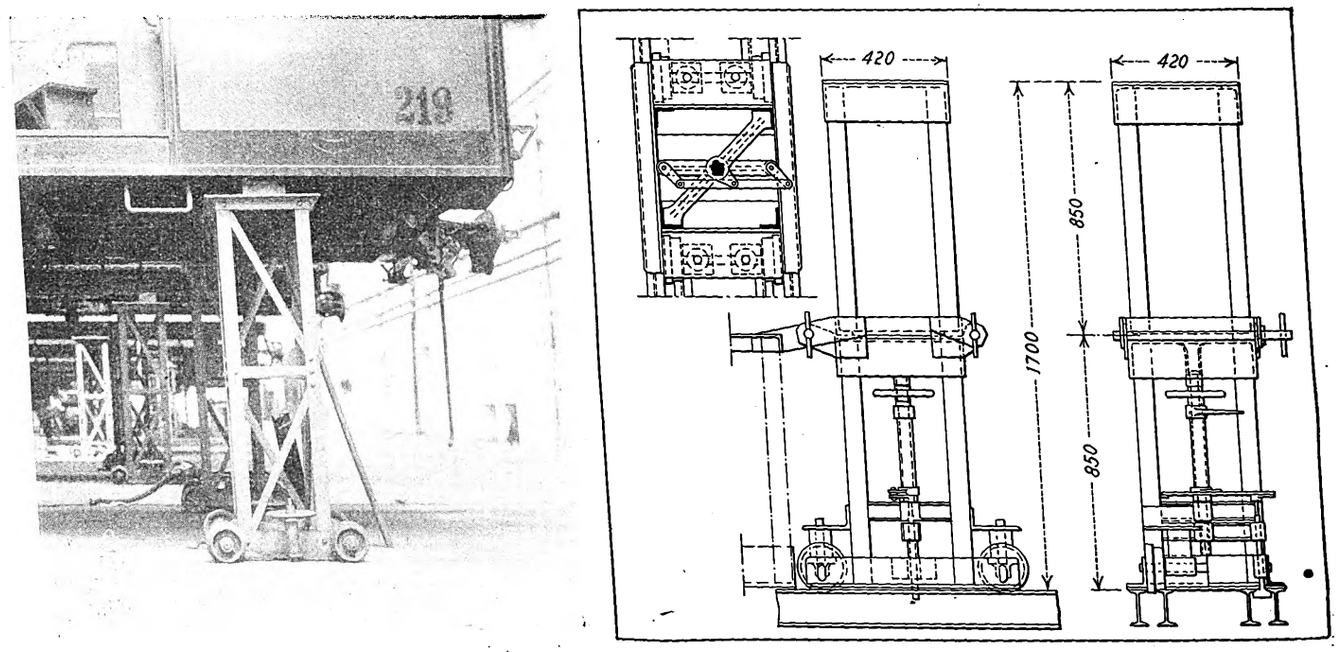
Support for Car Ends in Overhaul Shop

SUPPORTS of an ingenious type for the ends of cars while they are being overhauled have been developed by the Elevated & Underground Railway of Berlin, Germany. A feature of the design is that there are no cross girders or braces between the two supports at each end of the car. Hence, there is no obstruction to prevent a workman from getting at any part of the underside of the car. Another feature is that each axles the latter are set in eccentrically arranged bearings so that when the support is in its proper position the wheels with their axles can be moved with a lever off the floor, allowing the support to rest solidly on the girder rails. It is then locked in this position by means of an inverted steel T-bar whose shank passes through the slot between the I-beams and engages on their underside. This T-bar is raised by means of the hand it, the springs are compressed so far that the bottom of the support automatically comes to rest on the floor. The locking arrangement has also been simplified in that a lever half way up on the support is arranged to turn the inverted T-bar through an arc of 90 deg., and a spindle and hand wheel locks it against the under side of the I-beams. Still another change made is to build the support in two parts hinged together so that the upper part can be tilted over to allow the jack to support the car at



At left—This movable support can be locked in position and the weight taken off the wheels when it is used to support a car body. At right, recent modifications in the same support, as developed by the Elevated & Underground Railway of Berlin. The dimensions are in millimeters

corner support can easily be moved in the direction of the side sills of the car. This makes them very easily adjustable to various lengths of car, and when not in use they can be rolled back out of the way against the wall or center posts of the building.

The design shown in the accompanying half-tone was the form used at the time of the visit of a representative of the ELECTRIC RAILWAY JOURNAL to the repair shop of the company during the latter part of May, 1927. As will be seen, the support is built of structural steel and is mounted on four small wheels which run on tracks extending from the side wall to a short distance under the car. The structure is 15¾ in. square and 5 ft. 7 in. high. The rails on which it runs are formed of two pairs of I-beams separated by a distance slightly more than the thickness of the wheel flange.

To prevent the heavy weight of the car from coming on the wheels and wheel shown in the illustration near the base of the support. The T-bar clamps the support rigidly in position. A wooden block is placed on the top between the support and the side sill of the car, as shown in the illustration.

Since the visit of a representative of this paper to the repair shop of the Elevated & Underground Railway in Berlin several improvements have been made in this jack, according to a recent issue of *Verkehrstechnik*. The improvements are protected by German patents. In this later design the lever for lifting the wheels and axles out of the way when weight is put on the support is eliminated. Instead, spiral springs are placed directly above the wheel journals in a closed cylinder. The strength of these springs is such that the weight of the support alone does not depress them appreciably; that is to say, the support alone can be moved freely on its wheels. If, however, the car weight rests upon a lower height. This is desirable for certain operations, like replacing the side panels.

Besides their use in the shops of the Elevated & Underground Railway in Berlin, the German State Railway has introduced these movable supports in its new shops in Niederschoneweide-Johannisthal, but has made a few changes in their design. To increase their stability, they have been made slightly trapezoidal in the direction of the car. Instead of spiral springs for allowing the support to come to rest on the floor when the weight of the car is put upon it, leaf springs are used, the two axles being attached to the ends of the springs and their middle points being attached to the support. When the support is loaded the springs become flattened, allowing the support to rest on the girders, as before. The locking arrangement is similar to that in the Elevated & Underground shops.

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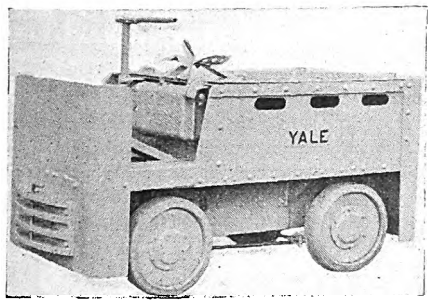
New Equipment Available

Heavy Type Electric Tractor

MODEL K24C tractor with four-wheel drive has been brought out by the Yale & Towne Manufacturing Company, Stamford, Conn. The machine is capable of an ultimate drawbar pull in excess of 4,000 lb., depending on road surface conditions, and will operate at a continuous drawbar pull of 1,000 lb. without danger of overheating. By driving all four wheels of the machine, it is possible to get the maximum of traction with the given overall weight of the machine. This feature is of particular advantage when the tractor is used to drive outdoors between buildings or where ice and snow are encountered.



New type of Yale electric tractor

The machine is fitted with four-wheel brakes, which operate through the differentials, so that they equalize properly regardless of the conditions of the lining. The spring, which automatically sets these brakes when the operator either releases the pedal or steps off the machine, is connected directly to the brake shoes so that any disarrangement of the linkages between the pedal and the brake lever would in no way hazard the driver of the machine. Should the linkage fail, the brakes would be set immediately and warn the driver that something is wrong.

The brake pedal is large, so that it is possible to rest both feet comfortably on it. The pedal lies flush with the wooden flooring of the tractor. By a suitable arrangement of toggle joints, the pressure required to start the pedal in the release or downward direction is greater than that which is required to hold it down once it has been depressed. To cut off power and apply the brakes, the pedal is allowed to rise. Should the operator leave his machine at any time or fall from it, the brakes would be set automatically.

Steering is through a rugged handle so arranged that it may be folded up out of the way if the driver wishes to leave the seat. Each of the steering knuckles on all four driving wheels is equipped with a ball thrust bearing which lightens the steering, permitting the driver to switch his machine quickly when in tight places.

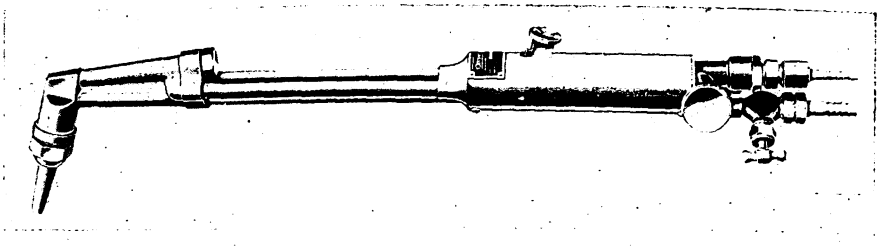
The driving mechanism consists of two standardized units connected parallel to the controller. The machine is furnished regularly with a 48-volt motor and a 23 to 1 gear ratio. The frame is unique in that the pressed steel guide members or main supporting members are integral with the axle yokes. This gives the frame a depth of 18 in., making it fairly capable of standing jolts and jars in addition to the usual bending stresses to which it is subjected. The bumpers are made of ½-in. plates and a triple bumper casting front and rear gives a range of coupling heights that will meet practically every requirement.

Improved Cutting Blowpipe

COMPLETE assurance against backfire, even under the most severe operating conditions, is claimed for a cutting blowpipe, known as type C-14, which has been added to the line of the Oxweld Acetylene Company, New York, N. Y. This blowpipe uses the same nozzles as the Oxweld type C-2, which it resembles; although several improvements in design have been made. The three gas tubes are straight, having no bends either outside or inside the handle. The cutting valve is of the same design as has been used on the type C-6 for many years and is now used on all hand-cutting blowpipes of the same make.

Some time ago the small needle valve bodies used for acetylene on the cutting blowpipes were improved by making them pressure forgings. Now, in addition to these, both the head and the rear body of the type C-14 are pressure forgings, instead of plain castings, giving better appearance, increased durability and lessened weight.

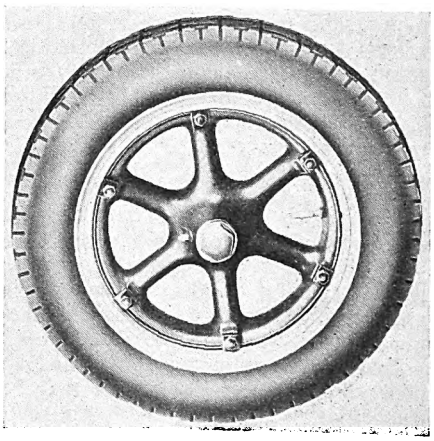
Interchangeable nozzles are provided so that the blowpipe may be used with either medium or low pressure acetylene. Obviously the medium pressure nozzle cannot be used with low pressure acetylene, but the low pressure nozzle can be used with a medium pressure acetylene supply if low pressure is maintained in the hose and blowpipe. To accomplish this, the regulator should be adjusted to give a flame showing an excess acetylene cone not more than 1 in. long when the acetylene valve on the blowpipe is wide open. The acetylene valve should then be adjusted to obtain the neutral flame.



Oxweld type C-14 cutting blowpipe

Light Steel Wheel

LIGHTNESS and strength are characteristics claimed for a new steel wheel for light trucks placed on the market by the Dayton Steel Foundry Company, Dayton, Ohio. It has the typical Dayton hollow-arch spoke construction, integral hub and felloe. It is cast in one piece from electric furnace steel. The spokes cannot loosen and flats, causing the wheel to wobble and decrease the life of the tire, will not develop. Metal is distributed so as to avoid localization of stresses. The wheels, cast in one piece, are machined at one set-up. Bearing bores, brake drum pilot and tread are concentric.



Dayton light steel wheel

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Association Activities

Advantages of High-Speed Railway Motors*

By N. W. Storer
Railway Engineer Westinghouse Electric & Manufacturing Company

SPEED is purely a relative matter. A motor in one generation may be considered high speed, while in another it would be low. The early double-reduction gear motors were dropped because they were of the bipolar type, were unprotected, and drove through poorly-cut or uncut gears. The noise was intolerable. The armatures were hand wound and commutation was bad. The single-reduction motor was radically different in almost every respect, having a slotted armature with form-wound coils, protected by the motor shell, and with only half as many gears.

Now, after an interval of nearly 40 years, we have the reappearance of the double-reduction gear in the form of a separate gear unit, the W-N drive, which permits a very high speed. The modern motor with single reduction and low wheels has about the same armature speed as the old double-reduction motors, so that the latest double reduction gives a speed unprecedented for street railway motors.

High-Speed Motor Troubles

The principal causes of trouble with the high-speed motors in the past have been commutation, broken armature leads, armature windings, rapid brush and brushholder wear, and short bearing life.

Bad commutation may be caused by poor compensation—the motor may be compensated for heavy loads and saturated fields as frequently happens in order to make a good showing on test. As a matter of fact, probably 90 per cent of the flashovers occur at high speed and light load. If the motor is fully compensated for heavy loads, it will be over-compensated at light loads when a very little sparking is likely to cause flashing. It should be compensated for higher speed and a little more sparking tolerated at heavy loads.

Flashing may also result at light loads, due to armature reaction causing a high distortion of the field under the pole pieces on account of the lack of saturation. Another fruitful source of flashing is poor brush contact between the brushes and the commutator resulting from rough commutator, bad track, worn gears and bearings, or unbalanced armatures. Anything that can cause a brush to jump or vibrate is likely to cause flashing. One of the best safeguards against flashing due to brush jumping is to use four brush-holders.

Obtaining Good Commutation

Other things being equal, a larger number of commutator bars will cut down the maximum volts per bar and will help, if not accompanied by too narrow bars. The old standard street car motors with commutators 9 in. to 11 in. in diameter were comfortably rated at 600 volts. There was room for an adequate number of bars and for distance between brushes. Decreasing the commutator diameter to 8 or 9 in. as was done in the present standard single reduction motors, cuts the distance between brush holders to about the minimum safe distance for 600 volts in street car motors.

It is well known that an economical 1,500-volt motor can hardly be built for a rating under 250 hp. Hence, it is the universal practice when smaller motors are required for operation on this voltage, to wind them for half line voltage and connect two motors permenently in series. It makes a much more economical equipment and gives entirely satisfactory results.

For the same reason, it is good practice to connect two small high-speed motors permanently in series for 600-volt operation. Commutator diameters of from 7 to 8½ in. are about the maximum that can be used for the 35 to 60 hp. sizes. Such diameters on 600 volts will have practically no margin. If wound for 300 volts, the margin for good commutation and elimination of flashing will be very large. Other advantages that go with the 300 volt winding are a larger armature conductor and fewer turns per coil, both tending towards a more rugged construction, longer life for both brushes and commutator, better insulation, less chance for breaking leads, and last but not least, a larger output for a given size of motor.

The increase in output due to winding these small high-speed motors for 300 instead of 600 volts amounts to about 10 per cent and is due to the better space factor of the windings; that is, on account of the smaller number of turns and the consequent smaller space required for insulation. It must be understood that while the motors are *wound* for 300 volts, they are *insulated* for 600 volts. The insulation to ground and the creepage surfaces should be the same as for 600 volts. A motor so constructed will be rugged and reliable, and should be free from the troubles that have been heretofore experienced with high-speed motors.

Practically the only objection that can be raised to this is the possible greater wheel slippage, but since the tendency at this time is altogether toward four-motor equipments with all weight on drivers, there is no difficulty to be found or experienced from this source. The 300-volt motors in service on the cars with worm gear drive and differential axle have given no trouble whatever from this source in spite of the greater possibility of slippage with differential axles. Accelerations of 4.27 m.p.h. per second have actually been measured with one of them. The motors with double reduction gears and solid axles should have a still larger factor of safety in this respect.

There is an additional advantage in the equipment from the operation of two motors connected permanently in series, as it permits the same control equipment as used for a two-motor equipment of the same total capacity.

Many Desirable Features

What is to be gained by the use of the ultra high-speed motor? It has several very advantageous features as applied, most of which are due to the mounting.

1. The motor weight is carried entirely on the truck frames or car body, so that the dead weight of the motor is entirely removed from the axle, and a great deal of punishment is thereby eliminated from the motors. The axle-hung motor suffers severely from the vibration communicated to it from the roadbed. The vibration is a serious source of commutator and brush holder trouble and of broken armature leads. There is little doubt that it also helps to crystallize armature shafts. Much of this trouble will be eliminated in an all-spring-supported motor. The track life will also be improved in proportion as the dead weight is removed from the axles.

2. The high-speed motor is so small that a smaller wheel is possible when used with the double reduction gear unit. This permits a lower floor car to be used with a single step between the street and the car floor. It will do away with the ramps and permit a floor of one level throughout. It will speed up loading and unloading materially.

3. The high-speed motor equipment offers a substantial reduction in weight over the standard single reduction equipment. This may not show a corresponding decrease in energy consumption. However, the difference will only be a small amount either way and will not have much influence.

**Abstract of a paper presented at the midwinter meeting of the New York Electric Railway Association, New York, N. Y., Jan. 31, 1928.*

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Keep on the Move or Die*

By Lucius S. Storrs
Managing Director American Electric Railway Association

IN ALL matters affecting the individual's business contact with his fellows the last ten wonderful years have brought about a complete change in the daily routine. The perfection of local and long-distance telephone connections, the multitude of personal transportation vehicles on the streets, and the general celerity with which all our business and social affairs are conducted, have brought about a state of mind, or perhaps of nerves, that makes each of us impatient of delays. We rush from home to work, from office to office, from point to point in our factories or stores. We rush to the theaters, night clubs or other entertainment and are loath to take the time for leisurely movement.

When we are confronted with traffic jams and delays in our trips through the cities we are more or less complacent if we are using our private autos, or even taxicabs, for we have within our personal control the matter of speed once the jam breaks and we get under way. But if we are caught in such a delay in a public vehicle, our impatience becomes intense and we become fearful that we will never reach our journey's end. That nebulous, intangible but none the less active force, public opinion, is working against the poor old street car. No matter what the facts may be, the public is convinced that there is no slower way of getting about than by using the street car.

Doubtless all of us have taken auto trips through cities in which the other fellow is responsible for the street car service and we have been caught in traffic signal delays with a street car just ahead. How often have you thought that traffic movement could be expedited greatly in that other fellow's city if he only had equipment capable of quicker acceleration, or a better arrangement of loading zones, or something else that would let you in your auto get by his street car.

Delays there will always be. They cannot be eliminated; but they are going to be vastly changed as we get to know more about how to handle traffic. One of the great irritants to the public in traffic congestion is the leisurely street car of the old style, that is always being caught in the rear of the procession and adding to the congestion. The newer type, quickly accelerating, rapid moving, car, is up in front of all signal-delayed traffic, and when the signal changes it is off and away before the automobiles get into second speed and is sure to beat them to the next corner. You can be sure the auto driver in a town where such cars are operated knows that the street cars are fast. He is reasonably certain that he will not waste any time in using the cars instead of his auto.

Don't forget that the auto driver is going to be a trolley rider one of these days—but you can't just wish him onto the car. You have got to offer him something he will at least be willing to use, to say nothing of something he will be anxious to use.

This matter of speed isn't just a hopeless ideal. In one city I have tried going by both trolley and taxi to a hotel some two miles from the business center. The streets there are wide enough amply to provide for the traffic, and the street car has won more times than it lost. Autoists in that city give the rails a wide berth if there is a chance of a trolley car coming along.

It can be done, and it is being done! But, relatively, so few managements as yet have the vision of speed possibilities that I am fearful that passenger traffic will be congesting the airways before there is a general realization of the possibilities of the electric railway cars.

Many of the most careful students in our industry have come to the conclusion that only so-called "necessity riding" is left for the street car. I would like to have their definition of "necessity riding." Surely it is a flexible term. Logically, the volume of such use of the cars depends very largely if not entirely on the type and quality of the service offered. But granting a minimum use of the cars as "necessity riding," then there is now, and will increasingly be, a maximum use that will be determined solely by the service characteristics.

There are electric railway managements that are firmly convinced that the service requirements of their territories can be fairly met with motor vehicles. Analysis shows that the street car service is being performed with the identical vehicles that were in use twelve years ago—same trucks, same motors, same bodies, same men, same methods. The only thing that is not the same is the number of passengers carried. Is it any wonder that the new automotive vehicles, with the new ideas and methods, appeal to public and management alike? But there never will be the same net as there was in the old days, no, nor as there could be in the near future, if some of the new ideas and new money were to find expression in the street car phase of the business. Ideas have got to move as well as street cars!

The amazing thing to me is that our own people cannot see the thing in its true proportions. They keep holding back and will not buy new cars or recondition older ones because the revenue is down and people don't use the cars. People don't use the old things because they were in use back in the dark ages—a perfect circle of can'ts and won'ts; no one getting anywhere except the railway, and that is getting broke.

And yet there are bright spots where an entirely different treatment has been given to the problem, where there is the greatest optimism in the management. There is on a number of properties a willingness to provide the best service possible with new equipment and new ideas preceded by a demand for higher rates. It is needless to say that higher rates were granted, and that by a complacent public. The maximum effect of high rates is possible only where the public's approval is obtained in advance of commission authorization.

**Abstract of a paper presented at the midwinter meeting of the New York Electric Railway Association, New York, N. Y., Jan. 31, 1928.*

COMING MEETINGS OF *Electric Railway and Allied Associations*

Feb. 13-17—American Institute of Electrical Engineers, winter convention, Engineering Societies Building, 33 West 39th Street, New York, N. Y.

Feb. 17-18—Central Electric Railway Accountants' Association, Hotel Gibson, Cincinnati, Ohio.

March 2—Metropolitan Section, American Electric Railway Association, Engineering Societies Building, New York, N. Y.

March 13-15—Oklahoma Utilities Association, annual convention, Tulsa, Okla.

March 14-15—Illinois Electric Railway Association, Springfield, Ill.

March 23—Maryland Utilities Association, annual meeting, Emerson Hotel, Baltimore, Md.

March 30—Executive Committee American Electric Railway Association, 292 Madison Avenue, New York, N. Y.

May 2-5—Southwestern Public Service Association, Dallas, Texas.

May 6-12—Union Internationale de Tramways, de Chemins de Fer d'Interet Local et de Transports Publics Automobiles, biennial meeting, Rome, Italy.

June 6-8—Canadian Electric Railway Association, annual convention and exhibits, Toronto, Canada.

June 20-27—American Railway Association, Div. 5—Mechanical (including former activities of the Master Car Builders' Association and the American Railway Master Mechanics' Association), annual convention and exhibit, Atlantic City, N. J.

July 8-12—Public Utilities Advertising Association and International Advertising Exposition, Detroit, Mich.

July 25-27—Electric Railway Association of Equipment Men, Southern Properties, Cincinnati, Ohio.

SEPT. 22-28, 1928

American Electric Railway Association, 47th annual convention and exhibit, Cleveland, Ohio.

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Traffic Lights Relieve Congestion*

By R. W. Emerson
Vice-President and General Manager Cleveland Railway

INSTALLATION of traffic control signals should always follow studies to determine, first, the necessity or desirability of making the installation, and second, the settings at which the signals should operate after installation. Signals should be installed only if the traffic movement will be improved by their presence or where safety cannot be otherwise provided. In Cleveland, an investigation is made to determine the number of vehicles arriving at the crossing, the number of lanes available at the intersection and whether or not there is a heavy left movement. When the need for mechanical signal control is established, a check is made at each intersection to determine from the traffic volume, prevailing movement, the number of available moving lanes, the influence of pedestrians and other factors governing traffic movement, the timing at which signals should be operated. These investigations have shown the use of short movements desirable. Cycles as low as 40 seconds are employed at many intersections.

Officer control at most isolated intersections can be an improvement over mechanical control if the officer appreciates the value of short movement and can give full time to his work. However, traffic officers must answer questions, assist pedestrians and enforce regulations, and these requirements, together with the common tendency to give long movement, to wait for wide-spaced vehicles approaching the intersection and the natural slow-down of activity as the officer becomes worn out by the monotony of the work, leave few officers efficient in traffic control.

Cleveland's Traffic Lights

At the present time Cleveland has installed 225 traffic lights, all suspended in the middle of the intersections. The great majority of these are at isolated corners in outlying sections and work independently. In numerous cases, where two intersections are not separated by more than 400 ft., two of these lights are tied together, working synchronously.

In addition to these intersections, we have three series or groups working on the progressive system. When running on the scheduled speed, automobiles arrive at each intersection after signals have been set to handle them without delay. Between the passing of these groups movements are given to cross traffic.

The first installation was that of East Cleveland, where, due to the extreme congestion on Euclid Avenue and the contemplated widening of the street, it became necessary to substitute some form of mechanical control for the manual control then in use. The first plan was to install a synchronous system. The length of the street proposed to be so controlled was approximately 2½ miles. It was proposed to install traffic signals at sixteen intersections in this distance.

Our experience with synchronous control up to this time had been very disastrous. The city of Cleveland had installed a series of synchronous lights in the congested district of Euclid Avenue, from East Eighteenth Street to the Public Square, which had the effect of slowing up car movement 20 per cent and increasing the average cost considerably, due to the increase in the demand which resulted from the simultaneous starting up of all cars in this area upon the appearance of the green light. In fact, this was so pronounced that an inspection of our recording power charts in the substations showed clearly the result on the power demand upon the appearance of each green light.

Progressive System Studied

With this effect in a distance of less than a mile, the Cleveland Railway readily perceived the difficulty that would ensue with a similar installation over a distance of 2½ miles, and as a progressive system had just been installed in the Loop District of Chicago, the company persuaded the officials of East Cleveland, Cleveland and Lakewood to accompany our officials on a trip to Chicago, where the system was minutely inspected. They learned that the system had been put into effect without any inconvenience and that, by its operation, traffic was moved through the Loop District more rapidly and more uniformly than previously. Street car movement in the area affected had been speeded up 20 to 25 per cent.

The officials of East Cleveland were profoundly impressed with this demonstration and voted to install a similar system on Euclid Avenue in spite of the considerable increase in cost over the original contemplated synchronous system. The Cleveland Railway, being equally interested in rapid car movement and decreased power costs, contributed largely to the work of installation, the city and the company working hand in hand to the end that the timing of the lights should correspond to our schedule speeds, which we then increased to 12 m.p.h. This street car speed permitted a speed of 24 m.p.h. or twice the street car speed for other vehicles. In other words, an automobile would run through two blocks while a street car moved through one.

The East Cleveland City Hall, being located approximately in the center of the system, provided the most logical location for the central control board. From this board, the lights at any intersection can be changed and the entire cycle which determines the speed throughout the area can be varied at will. The determining factor in the engineering calculations preliminary to this installation was the condition existing at Euclid and Superior Avenues, which is an oblique intersection, involving many left turns in two directions. To control this difficult intersection, six lights were installed.

Improvement With Lights

A check of this corner since installation shows definitely that many more machines pass with less congestion. Before the installation of the system, west-bound automobiles on Euclid Avenue were lined up for several blocks during many busy hours, whereas since the lights have been installed the line seldom extends beyond one block.

Profiting by the experience of East Cleveland, the city of Cleveland immediately started a study looking toward the conversion of the synchronous system installed on Carnegie Avenue to the progressive system. Carnegie Avenue is a boulevard, having no car tracks on it and is 3 miles in length. This change was made by an additional expenditure of about $7,500, to provide a master control, located at the center point on the system and control wires from it to each of the lights to coordinate their operation. The result of this change was to speed up the automobile traffic 30 per cent. Almost immediately thereafter the city changed the synchronous system on Euclid Avenue to the progressive system, thereby permitting us to speed up our schedules in this district by 20 per cent.

The city of East Cleveland, the city of Cleveland and the Cleveland Railway are convinced that traffic, controlled by automatic lights arranged in a progressive system, not only speeds up traffic, thereby relieving congestion, but so regulates headways as to render the advantage obtained applicable to other parts of the line not controlled by automatic lights. In addition to this uniform and smooth operating control, there is a marked reduction in accidents, due to the discouragement of speeding and the opportunity which is offered pedestrians to cross busy thoroughfares in safety. This is evidenced in the police records of East Cleveland, showing that there were 369 automobile accidents in this district in the year 1925 and only 155 in the year 1927, despite the usual increase in the number of automobiles upon the highway year by year.

Cities in general have merely scratched at the possibilities of automatic control of their traffic. There is an almost universal absence of engineering investigation preceding the installation. Most cities confronted with a serious congestion problem are deluded by the traffic light salesmen into the belief that their problem will be immediately solved by the installation of numerous lights. Such is far from the truth. Most light installations at the present time are a hindrance to the movement of traffic and tend to create congestion rather than relieve it.

Upon the purchase of a number of units by any city, there comes imme-

**Abstract of a paper presented at the midwinter meeting of the New York Electric Railway Association, New York, N. Y., Jan. 31, 1928.*

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diately a flood of requests from councilmen or aldermen for the installation of lights at their pet corners and for the most part, lights are distributed with reference to the respective political influence of the various public representatives rather than by the traffic requirements of the community. Unnecessary installations, operated continuously, while the demand is seasonable or covers only a short period of the day, contribute to violations.

Traffic lights, as such, are not a panacea for our congestion problem. There are certain locations where probably no mechanically controlled light will operate better than the present manual control. Our experience in Cleveland, however, has demonstrated to our own satisfaction that the progressive system, installed throughout a considerable extent of the congested district, when scientifically installed, does relieve congestion.

Brakes as They Affect Schedule Speeds and Accidents*

By E. R. Fitch
District Engineer Westinghouse Traction Brake Company

ONLY by taking advantage of every possible improvement in detail brake performance can we hope to supply to our fullest ability the increasing demand for faster and safer transportation. All factors which affect the schedule speed and particularly the braking characteristics of the car or train, influence the capacity of the system to a marked degree. An analysis of recent improvements in traction brake equipment shows that the stopping time is reduced approximately a half second for every second clipped from the brake application time, the standing time is shortened by the quicker release and that the flexibility of control has not been sacrificed. The most important development in recent years in surface car braking is the variable load attachment, which has been in subway service for the last thirteen years. The weight of the original design prohibited its use on city surface cars.

The combined effect of these modifications is to increase the running speed from 14.1 m.p.h. to 15 m.p.h. or 6.4 per cent, of which the effect of the variable load alone is 0.8 m.p.h. or 5.6 per cent. This is based on average surface car conditions assuming 30,000 lb., four-motor cars with a load of approximately 16,000 lb. or 110 passengers, with 8.15 stops per mile.

Good surface car brakes induce confidence in the car operator in his ability to stop promptly which results in the car keeping abreast of the traffic stream in heavy congestion instead of continually dropping behind. From a review of these elements it will be seen that the earning capacity of the cars would be increased at least 3 per cent due to the brake improvements at an increase in car cost of only 1½ per cent.

There is no one factor more important in the claims department record of accidents than brake performance and brake integrity. The latter may be considered to include protection of the brake to function even if one or more devices are defective, protection against man failure, against door and step accident, wheel sliding on bad rail, depletion of reservoir pressure, brakes leaking off when changing ends, and preventing passenger panic if the operator becomes incapacitated by permitting egress from the car when it is automatically stopped. The air brake and safety car control equipment provides this insurance through the deadman emergency feature, which balances the doors, sands the rail, cuts off the power and produces the shortest possible stop.

The recent improvements previously described will shorten the stop of the cars, already compared on a schedule speed basis, about 14 ft. for the reduction in application time of one second and about 40 ft. under the load condition with the variable load attachment from an initial speed of 20 m.p.h.

In the face of an impending collision, therefore, the car with this improved brake would be completely stopped while the other would be running at a speed of 8 m.p.h., retaining 40 per cent of its initial speed. This is probably the most important consideration as regards brake performance and its relation to accident hazards.

The ultimate measure of brake performance is the stopping distance and for comparative conditions from an initial speed of 20 m.p.h. a reduction of one second in the application time indicated a corresponding reduction in the stop distance of 14 ft. or about 10 per cent; under the load condition the variable load brake shortened the stop 28 per cent.

The actual brake shoe force developed is influenced to a marked degree by the details of brake rigging design. New cars with well designed brake rigging are generally conceded to develop about 70 to 75 per cent of the nominal shoe force and the loss of 25 per cent is due to rigging friction, release springs, armature and wheel inertia. For some of the old cars this figure may be as low as 50 per cent. Other conditions being comparative this factor alone means that the stopping distance would be increased 33 per cent. Obviously this condition would prevent the development of the full capactiy of the cars.

**Abstract of a paper presented at the midwinter meeting of the New York Electric Railway Association, New York, N. Y., January 31, 1928.*

Central Accountants Announce Program

SECRETARY L. E. Earlywine has just announced the program for the 56th meeting of the Central Electric Railway Accountants' Association. The meetings will be held at the Gibson Hotel, Cincinnati, Ohio, on Feb. 17 and 18. They will be preceded by a meeting of the executive committee at 9:30 a.m. the first day.

Friday, Feb. 17, Beginning 9:45 a.m.

Address of Welcome, Benjamin Frankland, auditor Cincinnati Street Railway.

"Ticket Office Ticket Printer," by L. P. Stickel, Ohmer Fare Register Company.

"Changed Price Levels and Property Accounting," by H. G. Baldwin, American Appraisal Company.

Discussion of items published in the Agenda.

Informal dinner, 6:30 p.m.

Saturday, Feb. 18, Beginning 10 a.m.

"Interlining with Central Freight Association" Informal discussion led by C. E. Baker, auditor Lima Toledo Railroad.

General business.

Election of officers.

Brady Memorial Awards to be Presented

PRESENTATION of the three Anthony N. Brady Memorial medals, awarded by the American Museum of Safety for outstanding accident prevention and health promotion work among electric railway organizations for the year ended Dec. 31, 1926, will be made at ceremonies to be held at the Hotel Biltmore, New York, N. Y., on Feb. 17. Many persons prominent in the electric railway field will attend the meeting.

Lewis Gawtry, chairman of the museum's committee of award, will preside. The medals and certificate will be presented by Haley Fiske, president of the Metropolitan Life Insurance Company. Other speakers will be Arthur Williams, president of the American Museum of Safety; Col. A. B. Barber, Lucius S. Storrs and James H. McGraw, members of the committee of award.

The awards for 1926 are: Gold medal, Louisville Railway; silver medal, El Paso Electric Company; bronze medal, Tide Water Power Company; and certificate of honorable mention, Pittsburgh Railways.

Safety Congress Meeting in New York City

THE Seventeenth Annual International Safety Congress is to be held in New York City Oct. 1 to 5 inclusive. This decision was made recently by the Executive Committee of the National Safety Council. All of the old popular features will be retained and several innovations introduced.

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Progress in Band Brake Design*

By A. D. McWhorter
General Superintendent Memphis Street Railway, Memphis, Tenn.

IN DEVELOPING the light-weight noiseless railway coach, one of the major problems was to develop a light-weight noiseless brake rigging. As a result, the band brake on street railway cars is today a reality. In general there are two types of band brakes, the external, or clasp type, and the internal expanding type. The internal expanding type, such as used on the Joliet car, utilizes metal brake blocks, while the external clasp type uses either brake lining or metal blocks.

There are probably less than a dozen street railway companies in the country using such brakes. According to available records, the first experimental equipments were designed by W. J. Smith, master mechanic Twin City Rapid Transit Company, Minneapolis, in the summer of 1920. The original experimental equipment was on double-truck cars, approximately 37 ft. long and weighing 28,000 lb. Satisfactory results have been reported and since that time the Twin City company has built for its own use and for other companies a total of 101 cars equipped with the Smith light-weight noiseless truck with band brakes.

Steel and Gray Iron Drums Used

Both steel and gray iron drums have been used, steel being the lighter, gray iron the quieter. Gray iron has been adopted as standard. Brake shoe backs are steel, lined with ¾-in. "Hyco" brake lining and soft gray iron lugs at the ends. The total cost per lining (8 linings per car) is $2.36. The average cost per thousand car-miles for brake linings is $1.06. Gray iron brake shoes at $40 per ton used on steel wheels in similar service cost $1.74 per thousand car-miles. In addition to the above saving in favor of brake bands, there is also a saving in labor in adjusting and renewing brake shoes, adjustment being necessary only after 2,000 miles service.

In the 33 months of operation, the total mileage was 511,500, an average of 93,000 miles for the wheels. To date only a few of the wheels have been removed. Officials of the company believe that the wheel mileage on this class of equipment will be increased from 40 to 50 per cent. The weight of the wheels when new was 297 lb. When removed from service, the weight was 139 lb. In other words, in 93,000 miles service, 108 lb. of weight was lost. Under similar conditions but with gray iron brake shoes used on the tread of the wheel, 60,000 to 65,000 wheel-miles would be considered a fair average. This comparison would indicate about 33 per cent increase in wheel-miles with band brakes. The above description of equipment applies to hollow street car axle trucks.

The Tennessee Electric Power Company, Chattanooga, placed in service about Nov. 1, 1926, ten cars built by the Twin City Company. Up to Jan. 1, 1928, these cars operated a total of 594,000 miles. They experimented with many kinds of linings and adopted the Gatke brake linings as standard. Adjustment is made on a 1,000-mile basis but experiments have proven that the adjustment period may be extended to 3,000 or 4,000 miles. The cost per thousand car-miles with ½ in. by 6 in. Gatke brake linings is $1.16. It is the opinion of the operating officials that the cars equipped with band brakes are much quieter than cars with brake beams, hangers, heads, shoes, etc. The estimated life of 26-in. wheels with band brakes is 100,000 to 125,000 miles.

The Springfield Street Railway, Springfield, Mass., has had a double truck car in service since May 13, 1927, which has operated approximately 8,000 miles. It has a seating capacity of 45 and weighs 25,300 lb. The brake equipment was assembled from Westinghouse Air Brake Company material, making whatever changes were necessary to accommodate standard equipment to the special requirements. The essential features are an application and release magnet, and an emergency magnet which in conjunction with a K-1 emergency valve gives all safety features on open circuit. Sanding is accomplished, except in emergency, by means of magnet valves.

Brake Shoes of Special Material

The brakes are inspected during the car inspections made every 1,000 miles. Adjustment is not always necessary on the 1,000-miles basis. The brake shoes are of special material, manufactured by the American Brake Block Company, and have proven very satisfactory. To date the brake shoes show no appreciable wear and officials have no figures as to cost per 1,000 car-miles. It is estimated that considerably longer wheel life will result from wheels which are not subject to gray iron shoe wear.

When this special material is employed the coefficient of friction is much more constant under varying speeds than with gray iron shoes on a steel wheel. The brakes give a very smooth stop without the sudden shock which is experienced with gray iron shoes just before the car comes to rest. This is true even with excessive rates of braking. In trials with various types of brake linings and various materials for brake drums, it has been found that certain combinations give more effective braking power and that squeaking noises can be eliminated. In Chattanooga the Gatke brakelining with Hunt Spiller gun iron drums have been found quiet and most satisfactory. In tests which have been made, the deceleration has run as high as 4.35 m.p.h. per second without discomfort. The ordinary braking rate on this car is around 2 m.p.h.

In Joliet, Ill., there is in operation an experimental car equipped with Westinghouse automotive type brake diaphragms, carried directly on the automotive type axle housings and connected through the brake mechanism to the internal expanding shoes at each wheel. The brake drums are 17¼ in. in diameter with 4-in. face. They are bolted to the inside of the wheels and have fins turned on their outside surface to improve heat radiation. There is 1/16 in. effective wearing metal to insure long life before renewal is necessary. Two brake blocks are used on each shoe having an area 4 in. by 5½ in. Almost four times the braking surface ordinarily provided on buses is thus obtained.

Abstract of a paper presented at the semi-annual meeting of the Electric Railway Association of Equipment Men. Southern Properties, held at New Orleans, La., Jan. 25-28, 1928.

American Association News

DETAILS of the work now in progress were discussed at a meeting of way and structures special committee No. 2 at association headquarters, New York City, on Jan. 18.

A drawing of the proposed 200-ft. lateral switch was submitted by Mr. Stiff, who was representing Mr. Entwisle. In the discussion which followed, Mr. Ryder suggested shortening the tongue and over-all length of the switch, which would make tongue and casting stiffer and lighter, and should reduce the cost of the switch. Mr. Alden objected on the grounds that it would increase the overhang on clearance curves about 1 in. or less and increase the angle on incidence ½ deg. It was decided that the 16-ft. 6-in. over-all length of switch be maintained, the point of the tongue to be 2 ft. 8 in. from the end of the casting, measured at a point 1 in. back from the tip of the tongue, and between these points to be exactly the same as the 100-ft. lateral switch.

The shape of the pocket for the 200-ft. lateral switch was discussed and changes were suggested by Mr. Stiff. Mr. Alden was requested to make a new drawing showing the approach radius on both sides as 5 in., and the pocket radius on both sides as 1½ in. Copies of the drawing are to be sent to all members of the committee for study, and the chairman will send out a letter ballot for approval.

The width of groove for both the 100-ft. lateral and 200-ft. lateral switches was discussed at length. It was decided that in all switches of 100 ft. and larger radii the groove be made 1 1/16 in.

On the way to lunch the committee looked over several special-work lay-

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outs of the Third Avenue Railway to observe the effect of wheel wear on the tread of the running rail at the pocket and to determine if possible whether the shape of the pocket had any particular relation to the development of a cup on the tread of the rail at that location.

At the afternoon session drawing No. 114,152, 9-in. high standard switch, prepared by Mr. Entwisle was submitted and discussed. The design was approved by the committee, except that the diagonal braces should follow the revised design for 100 ft. lateral switch. It was also voted that plan No. 110,113 for the 200-ft. equilateral switch be approved and Mr. Alden was requested to prepare a finished drawing for submission at the next meeting. The plan proposed at the previous meeting "that the distance from the tangent point to the point of tongue, and length of tongue, and location of lug be determined for the 50-ft. lateral, 75-ft. lateral, 100-ft. equilateral and 350-ft. equilateral tongue switches" was tabled for the time being.

After discussion the committee decided that the manufacturer's name or brand be placed on the cast-iron cover, on the guard of the switch tongue, and also on the guard of the switch body just back of the tongue pin. Just beyond the manufacturer's name or brand on the guard shall be placed the letters A.E.R.E.A., followed by the figures indicating the radius, and letters indicating the hand. Mr. Payne asked for further instructions on the subject, and also presented plans for several different types now in use. After discussing the matter Mr. Payne was requested to prepare two designs, one for T rail in open track and one for girder rail in closed track.

The committee decided to change the title of subject D from "Maintenance Standard for Track Switch Tongues in Paved Streets," to "Rules for Maintenance of Tongue Switches." Mr. Bragg presented a report giving rules for the maintenance of hand-throw tongue switches, and also for electrically operated tongue switches. He was requested to make some changes suggested by members of the committee and report at the next meeting.

Mr. Peabody submitted a plan showing three layouts for No. 8 double spring frog marked A-B-C. Layout B was approved with some changes to be made. It was decided that to have a supported joint at the toe of the frog, and that the space at the toe be 19½ in. and the spaces at the heel be 18 in. making a suspended joint at the head. Over-all length of the frog is to remain 15 ft. Design 1521 of the Bethlehem Steel Company for double spring rail frog will be used for the design of the anti-creeper device, in place of the arrangement shown on layout B of Mr. Peabody's design.

Mr. Alden submitted two drawings for the proposed 16-ft. 6-in. long split switch, one for wheel flanges A, B, C and D only and one for wheel flanges A, B, C, D, and E and F. After considerable discussion it was decided by the committee that the spring should be 18 in. long. Other changes, of which Mr. Alden made note on his plans, were suggested by the committee and Mr. Alden was requested to submit at the next meeting of the committee a revised single plan covering the subject instead of two plans.

The next meeting is to be held at Association Headquarters on Friday, Feb. 24.

Those present were E. M. T. Ryder, chairman; E. P. Roundey, vice-chairman; H. F. Heyl, C. A. Alden, G. A. Peabody, D. R. Payne, J. U. Bragg and Mr. Stiff representing Mr. Entwistle.

Affiliated Association Committee Appointments

COMPLETE assignments of committees of the American Electric Railway Association and affiliated associations have now been made. The list of American committees was published in full on Jan. 28. The Engineering Association committees were published as they were appointed after the beginning of the association year. In the following list are the complete committee lists of the Accountants', Claims, and Transportation and Traffic Associations, together with certain Engineering Association committees which have not heretofore been made public.

Accountants' Association

Fare Collections

E. A. Tuson, general auditor Public Service Railway, Newark, N. J., chairman.
J. D. Evans, St. Louis, Mo.
A. G. Neal, Washington, D. C.
W. G. Nicholson, Omaha, Neb.

Freight Accounting

Walter Shroyer, treasurer for receiver Union Traction Company of Indiana, Anderson, Ind., chairman.
F. I. Fleming, Champaign, Ill.
F. A. Healy, Springfield, Ohio
L. T. Hixson, Indianapolis, Ind.
A. E. Wafer, Akron, Ohio

Review the Proceedings

J. E. Heberle, assistant to president Capital Traction Company, Washington, D. C., chairman.
F. E. Hageman, Milwaukee, Wis.

Standard Classification of Accounts

M. W. Glover, general auditor West Penn Railways, Pittsburgh, Pa., chairman.
Thomas Conway, Jr., Philadelphia, Pa.
J. H. Hanna, Washington, D. C.
I. A. May, New Haven, Conn.
C. S. Mitchell, Pittsburgh, Pa.
H. L. Wilson, Boston, Mass.
P. S. Young, Newark, N. J.

Stores Accounting

R. A. Weston, special accountant the Connecticut Company, New Haven, Conn., chairman.
W. S. Stackpole, Newark, N. J.
F. E. Wilkin, Youngstown, Ohio

Bus Accounting (Sub-Committee, Standard Classification of Account)

E. A. Tuson, general auditor Public Service Railway, Newark, N. J., chairman.
C. R. Mahan, Highwood, Ill.
J. F. Schmunk, Philadelphia, Pa.
C. W. Stocks, New York, N. Y.
N. E. Stubbs, Baltimore, Md.

Convention Program

E. H. Reed, auditor Brooklyn City Railroad, Brooklyn, N. Y., chairman.
L. T. Hixson, Indianapolis, Ind.
C. E. Yost, Wilmington, Del.

Editing

L. E. Lippitt, Thermo-ice Corporation, Auburn, N. Y., chairman.

Engineering Accounting

L. T. Hixson, auditor Terre Haute, Indianapolis & Eastern Traction Company, Indianapolis, Ind., chairman.
F. A. Healy, Springfield, Ohio
T. P. Kilfoyle, Cleveland, Ohio
C. R. Mahan, Highwood, Ill.
Walter Shroyer, Anderson, Ind.

Claims Association

Editing

W. F. Weh, superintendent accident department Cleveland Railway, Cleveland, Ohio, chairman
H. D. Briggs, Newark, N. J.
W. H. Hyland, Gloversville, N. Y.
Wallace Muir, Lexington, Ky.
J. J. Reynolds, Boston, Mass.

Safety

H. K. Bennett, safety manager United Electric Railways, Providence, R. I., chairman.
A. D. Brown, Syracuse, N. Y.
H. E. Cady, Utica, N. Y.
J. R. Compton, Birmingham, Ala.
R. H. Ferguson, Chicago, Ill.
J. W. Giltner, Akron, Ohio
G. H. Ingles, Richmond, Va.
A. G. Jack, Wilmington, Del.
P. W. Klabunde, Milwaukee, Wis.
T. C. Neilson, East St. Louis, Ill.
J. M. Orts, Newark, N. J.
J. J. Reynolds, Boston, Mass.

Subjects

J. R. McNary, manager of adjustment department, Pittsburgh Railways, Pittsburgh, Pa., chairman.
A. T. Bagley, Kansas City, Mo.
S. W. Baldwin, New Haven, Conn.
J. J. K. Caskie, Buffalo, N. Y.
H. V. Drown, Newark, N. J.

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Engineering Association

ELECTRIC RAILWAY JOURNAL MAINTENANCE CONTEST

A. T. CLARK, superintendent rolling stock and shops United Railways & Electric Company, Baltimore, Md., chairman.
H. H. GEORGE, Newark, N. J.
CHARLES GORDON, New York, N. Y.
G. C. HECKER, New York, N. Y.
F. MCVITTIE, Rochester, N. Y.

ENGINEERING—ACCOUNTING

E. D. DREYFUS, advisory engineer West Penn Railways, Pittsburgh, Pa., chairman.
E. J. DICKSON, Pasadena, Cal.
C. R. HARTE, New Haven, Conn.
R. B. RIFENBERICK, Detroit, Mich.

ROLLING STOCK SPECIAL COMMITTEE NO. 7—AUTOMATIC COUPLER SPECIFICATIONS

P. V. C. SEE, superintendent of equipment, department of railways, Northern Ohio Power & Light Company, Akron, Ohio, chairman.
C. M. BANGE, Scottsburg, Md.
M. W. BARNELL, Dayton, Ohio
A. J. CHALLEEN, Detroit, Mich.
J. B. CORDERMAN, Lima, Ohio
A. B. CREELMAN, Youngstown, Ohio
D. C. DAVIS, New York, N. Y.
G. G. FLOYD, Chicago, Ill.
F. J. FOOTE, Springfield, Ohio
H. W. GILBERT, Cleveland, Ohio
G. T. JOHNSON, Columbus, Ohio
J. C. MCCUNE, Wilmerding, Pa.
T. H. NICHOLL, Anderson, Ind.
A. L. PRICE, Mansfield, Ohio
H. E. VAN DORN, Chicago, Ill.

WAY AND STRUCTURES SPECIAL COMMITTEE NO. 9—MOTOR BUS GARAGE DESIGN

ADRIAN HUGHES, JR., superintendent of bus transportation United Railways & Electric Company, Baltimore, Md., chairman.
A. J. BLACKBURN, Boston, Mass.
A. J. CHALLEEN, Detroit, Mich.
D. E. FRAME, Wilmington, Del.
G. H. HALDEMAN, Newark, N. J.
J. H. LUCAS, Milwaukee, Wis.
J. R. MCKAY, Ft. Wayne, Ind.
L. F. PARLETTE, Philadelphia, Pa.
S. R. SUNDSTROM, Indianapolis, Ind.
W. W. WISE, New York, N. Y.

WAY AND STRUCTURES SPECIAL COMMITTEE NO. 16—FOUNDATION AND SUPPORTING STRUCTURES FOR STEAM RAILROADS

L. A. MITCHELL, engineer maintenance-of-way Union Traction Company of Indiana, Anderson, Ind., chairman.
H. A. ABELL, Rochester, N. Y.
R. B. BROKAW, Peoria, Ill.
P. A. MEYER, Connellsville, Pa.
J. C. NEWMAN, Richmond, Va.
J. H. SUNDMAKER, Cincinnati, Ohio
D. H. WALKER, Indianapolis, Ind.

Representatives on Other National Organizations

AMERICAN RAILWAY ENGINEERING ASSOCIATION

W. W. WYSOR, Baltimore, Md., representative.

AMERICAN WELDING SOCIETY

E. M. T. RYDER, New York, N. Y., representative.

NATIONAL ASSOCIATION OF PURCHASING AGENTS

ELECTRICAL CONTRACT FORMS

L. D. BALE, Cleveland, Ohio, representative.

NATIONAL FIRE PROTECTION ASSOCIATION

POWER HOUSE COMMITTEE

L. D. BALE, Cleveland, Ohio, representative.
G. C. HECKER, New York, N. Y., representative.

GARAGE COMMITTEE

K. B. BRIER, Philadelphia, Pa., representative.
A. D. KNOX, New Haven, Conn., representative.
G. C. HECKER, New York, N. Y., representative.

NATIONAL SAFETY COUNCIL

ELIMINATION OF HARMFUL NOISE

H. S. WILLIAMS, Detroit, Mich.

SOCIETY OF AUTOMOTIVE ENGINEERS MOTOR COACH DIVISION

V. W. BERRY, Richmond, Va., representative.

U. S. DEPARTMENT OF COMMERCE

COMMITTEE TO CO-OPERATE ON SUBJECT OF STANDARDIZATION

E. P. GOUCHER, Washington, D. C., chairman.
C. A. S. SINCLAIR, Washington, D. C.
W. W. WYSOR, Baltimore, Md.

COMMITTEE ON WELDED RAIL JOINTS OF THE A.E.R.A. AND THE AMERICAN BUREAU OF WELDING

EXECUTIVE COMMITTEE

G. K. BURGESS, Director Bureau of Standards, Washington, D. C., Chairman.
E. M. T. RYDER, New York, N. Y., vice-chairman.
W. SPRARAGEN, New York, N. Y., secretary.
C. A. ADAMS, Cambridge, Mass.
R. H. DALGLEISH, Washington, D. C.
G. C. HECKER, New York, N. Y.
H. M. STEWARD, Boston, Mass.
G. L. WILSON, Minneapolis, Minn.
W. W. WYSOR, Baltimore, Md.

AMERICAN ENGINEERING STANDARDS COMMITTEE

C. R. HARTE, New Haven, Conn., representative.
W. W. WYSOR, Baltimore, Md., representative.
G. C. HECKER, New York, N. Y., alternate.

Transportation and Traffic Association

BUS OPERATION

ADRIAN HUGHES, JR., Superintendent of bus transportation United Railways & Electric Company of Baltimore, chairman.
B. W. ARNOLD, Milwaukee, Wis.
C. H. CHAPMAN, Waterbury, Conn.
J. C. JOHNSON, Michigan City, Ind.
C. F. KELLS, Pittsburgh, Pa.
J. J. MANGAN, New York, N. Y.
M. G. MOORE, Boston, Mass.
T. W. NOONAN, Pittsburgh, Pa.
E. S. PARDOE, Washington, D. C.
J. M. PENICK, Richmond, Va.
M. W. REW, Cleveland, Ohio.
LEO REYNOLDS, Detroit, Mich.
ALEXANDER SHAPIRO, Washington, D. C.
J. L. SMITH, Toronto, Canada.
A. T. WARNER, Newark, N. J.
H. G. WEEKS, Los Angeles, Cal.
W. H. BOYCE, Pittsburgh, Pa., sponsor.
F. L. BUTLER, Atlanta, Ga., sponsor.
SAMUEL RIDDLE, Louisville, Ky., sponsor.

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SAMUEL RIDDLE, Louisville, Ky.
P. E. WILSON, Cleveland, Ohio.

SERVICE BETTERMENT

W. E. WOOD, president Virginia Electric & Power Company, Richmond, Va., chairman.
A. C. SPURR, Wheeling, W. Va., vice-chairman.
J. L. ALEXANDER, Houston, Tex.
A. J. BOARDMAN, Boston, Mass.
J. F. CRAIG, New York, N. Y.
L. C. DATZ, St. Louis, Mo.
L. J. DELAMARTER, Grand Rapids, Mich.
C. H. EVENSON, Chicago, Ill.
D. L. FENNELL, Kansas City, Mo.
J. H. MCCLURE, Dayton, Ohio.
E. A. PALMER, East Pittsburgh, Pa.
D. A. SCANLON, Akron, Ohio.
D. A. SMITH, Detroit, Mich.
J. B. STEWART, JR., Cincinnati, Ohio.
C. H. STRONG, Atlanta, Ga.
J. C. THIRLWALL, Schenectady, N. Y.
W. E. THOMPSON, New York, N. Y.
C. L. VAN AUKEN, Chicago, Ill.
C. W. WILSON, Pittsburgh, Pa.
R. N. GRAHAM, Youngstown, Ohio, sponsor.
P. E. WILSON, Cleveland, Ohio, sponsor.

TRAFFIC AND SAFETY

R. W. EMERSON, vice-president and general manager Cleveland Railway, Cleveland, Ohio, chairman.
H. O. ALLISON, New Brighton, Pa.
A. W. BROHMAN, San Francisco, Cal.
H. H. DARTT, Scranton, Pa.
J. A. DEWHURST, New York, N. Y.
S. E. EMMONS, Baltimore, Md.
C. H. ENGLISH, Erie, Pa.
A. J. FINK, Pittsburgh, Pa.
ARTHUR GABOURY, Montreal, Canada.
W. W. HOLDEN, San Antonio, Tex.
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E. K. MILES, Syracuse, N. Y.
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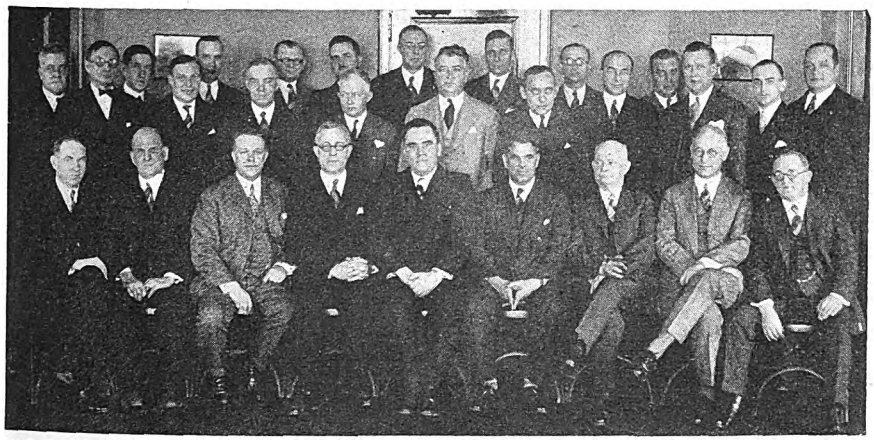
Exhibit

PREPARATIONS for the 47th convention of the American Electric Railway Association, to be held in Cleveland on Sept. 22-28, were carried forward at the meeting of the committee on exhibit held in the office of Col. Joseph H. Alexander, Cleveland, Ohio, on Feb. 8.

Those present included Chairman Alexander, L. W. Shugg, vice-chairman; C. S. MacCalla, chairman of the entertainment committee; J. C. McQuiston, vice-chairman of the entertainment committee; J. W. Welsh, general secretary; F. C. J. Dell, director of exhibits; L. D. Bale, J. R. Blackhall, O. A. Broten, F. B. Bullock, W. E. Cann representing C. C. Castle, C. H. Clark, H. F. Flowers, R. A. Hauer, C. S. Hawley, A. L. Kasemeier, H. J. Kenfield, E. J. Lang, H. E. Listman, S. P. McGough, A. M. Robinson, Ross Schram, S. P. Seward, L. F. Stoll, J. B. Tinnon, L. G. Dickey, manager of the Cleveland Auditorium, and J. W. Kellison, assistant to president Cleveland Railway.



Members of the exhibit committee at the recent Cleveland meeting

Mr. Dell was appointed to act as secretary of the meeting. He read the report of the director of exhibits, outlining the preliminary work which had been done. A special committee on contract, with Frank R. Coates as chairman, has made the agreement with the Cleveland Convention committee, covering the housing and preparation of the exhibit. This agreement is drawn along similar lines to that of last year. Contracts have also been drawn with the sub-contractors for furniture, flowers, drayage, etc. The prices agreed to by all contractors are in line with those previously quoted. All contractors are acceptable to the Auditorium management and are acquainted with its personnel. The rules and regulations adopted are practically the same as those for last year, which were found very satisfactory.

Attention was called to the action of the executive committee of the association, which set a rate of 60 cents per square foot for inside space and $2 per lineal foot of track space. Mention was also made of the resolutions regarding outside exhibits, assignment of one day for inspection of exhibits and plans for inspection of local manufacturing plants. These were published in this paper for Feb. 4, page 223. It was also pointed out that on account of the early dates for holding the convention this year it is planned to send out space applications on April 16, with 30 days' allowance for filing them.

Minutes of the meeting of a sub-committee appointed for the purpose of laying out floor plans were also read. This sub-committee, of which L. W. Shugg was chairman, met on Feb. 7. It was decided to recommend that the registration facilities should be placed in the new main building on the Lakeside Avenue side. After considerable discussion it was proposed to locate the dance floor in approximately the same position as last year. The same scheme as last year's for space layouts for the esplanade, the track space and the west wing was recommended. It was decided to recommend that the Engineers' meeting room be located in the lower exhibition hall, and that location of all the other meeting rooms be left to a special sub-committee. The report was approved by the main committee.

Chairman Alexander brought up the question of exhibit day, and Mr. Welsh explained the reasons for selecting Tuesday, Sept. 25, instead of Wednesday, the usual day. After hearing the report it was voted to set aside Tuesday as exhibit day. The space layout for the arena floor, with the ball room as recommended by the sub-committee, was approved.

Mr. Robinson spoke of the desirability of having the exhibits open at 9 a.m. on Saturday, Sept. 22, instead of at noon as was done last year. After a general discussion this opening time was approved. It was also decided to have a formal opening ceremony and some form of entertainment for Saturday evening. Mr. Welsh was instructed to inform the transportation committee to arrange so that the special trains will arrive in Cleveland in time for the opening.

It was decided to hold the next meeting of the exhibit committee, for the purpose of assigning space, at the office of the chairman, in Cleveland, at 10 a.m. on May 16.

Street Traffic Economics

ORGANIZATION of the committee on street traffic economics was effected at a meeting held at association headquarters in New York City on Feb. 9. Those present included the following: G. A. Richardson, chairman; John A. Beeler, E. P. Goodrich, J. H. M. Andrews, J. R. Bibbins, S. E. Emmons, R. F. Kelker, Jr., E. J. McIlraith, L. H. Palmer, G. C. Hecker and Charles Gordon. After preliminary discussion of the scope of the committee's work it was voted to change the name of the committee to that given above instead of "street traffic and mass transportation," which was the name originally selected.

Most of the time of this first meeting was devoted to a discussion of the various phases of the street traffic problem with a view to determining the scope of the work to be undertaken this year and developing a plan of procedure. At the suggestion of Chairman Richardson, Mr. McIlraith read a rough outline of suggested topics for consideration.

It was the consensus of opinion that the committee should confine itself this year to a consideration of only such phases of the traffic matter as could be handled in the limited time available, with the understanding that the committee's activities will probably extend over a period of several years, and that this year's studies will form the groundwork for the extension of its work.

It was likewise agreed that the committee should confine itself to the development and presentation of principles and basic facts that affect the proper solution of the traffic problem. It is not anticipated that the committee will be able to agree entirely on some of the fundamental principles involved, but in that event it will endeavor to present diverging views on the subject so as to provide the public and the industry with an adequate and authoritative outline of current thought on traffic matters.

At the suggestion of the committee, Mr. McIlraith prepared a rough outline of his suggestions regarding the scope of this year's work. The topics suggested were as follows:

"Reasons why people concentrate in cities and in central areas."

"Interpretation of purpose of streets as public thoroughfares."

"Legal history of rights to use of streets."

"Present use of city streets in various types of cities (a) service in maximum hour showing number and type of existing traffic units, including pedestrians; (b) measure of relative use during various hours of the 24; (c) compilation of wastage of street space; (d) principles of betterment of use of streets; (e) betterment measures now in actual practice."

Mr. McIlraith was delegated to compile a more comprehensive outline of the available data and opinions on these respective topics.

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News of the Industry

Injunction Against New York Fare Increase Denied

Supreme Court Justice Ernest E. L. Hammer on Feb. 4 denied the application of the Bronx Chamber of Commerce to restrain the Interborough Rapid Transit Company from increasing the fare on its subway and elevated lines from 5 to 7 cents because the city was not a party to the action. The denial was without prejudice to a renewal on proper papers. It followed the assertion by Samuel Untermyer, special counsel of the Transit Commission, that such litigation at this time would serve only to "muddy the waters" and complicate matters. Mr. Untermyer asked for the postponement of any move for an injunction until the Transit Commission had acted on the Interborough's application to put the 7-cent fare into effect within five days.

Conferences among city and state officials on Feb. 9 resulted in an apparent agreement to oppose the application in three separate suits, one to be brought by the city, one by the Transit Commission and a third suit to be brought jointly by the city and the commission.

City Appeals Denver Case

The city of Denver has filed a petition with the United States Court of Appeals at St. Louis for a rehearing of the case in which that body declared in substance that the Denver Tramway franchise was perpetual. Talk has recently been revived of a plan to carry the case to the United States Supreme Court if the present plea for a rehearing is rejected. This is so even in the face of the fact that it was stated at the time the decision was rendered such a course was unlikely on the part of the city since the United States Supreme Court had refused in January, 1927, to take jurisdiction. The issues involved in this case were reviewed in the ELECTRIC RAILWAY JOURNAL for Dec. 24, 1927.

Commission Sought as Arbitrators in Fort Wayne

Formal request for the Indiana Public Service Commission to act as a board of arbitration in a wage dispute between the Indiana Service Corporation and its railway employees at Fort Wayne, Ind., was made in a petition filed by representatives of a committee said to represent a majority of the trainmen.

Wage increases sought as indicated in the petition follow: For the first three months from 41 cents to 65 cents an hour; after the first three months from 41 and 43 cents an hour to 67½ cents, and for the succeeding nine months and more than a year 70 cents an hour. The present wages, the petition asserted, are "wholly inadequate to maintain a family and meet the living conditions in Fort Wayne."

The petition was filed under the terms of a clause in the working agreement authorizing employees to refer disputes to the commission for arbitration when relief is denied by the company.

New Fares in Port Arthur

A new schedule of fares went into effect on Jan. 21 in Port Arthur, Tex. It provides for the same 10-cent straight fare, three tickets for 25 cents and a weekly card for 40 cents, which calls for a nickel fare as many times as used each week, similar to the fare rates in Houston. The Port Arthur Traction Company was sold recently to the Eastern Texas Electric Company. Confirmation of the scale was made on Jan. 10 in federal court at Beaumont.

Ten Cents in Madison—Valuation Under City Figure

An increase in cash and ticket fares was granted the Madison Railways, Madison, Wis., by the Wisconsin Railroad Commission to take effect on Tuesday, Feb. 7.

Cash fares are increased from 8 cents to 10 cents; sixteen instead of seventeen tickets will be sold for $1 and three tickets for 25 cents. School childrens' tickets will be sold at ten for 50 cents; two children under twelve will be allowed to ride for one adult ticket; heretofore such children were allowed to ride for 4 cents. These rates will also be applied to buses, but no free transfers will be allowed between trolleys and buses.

The order of the commission places the valuation of the property at $1,203,000, whereas the company claimed a valuation of $2,188,501.

The commission turned down the weekly pass privilege, which had been asked by the city. As to the contention of the city that lower fares would help the company more than higher fares the commission said:

> As the lower fares have been in effect heretofore and did not produce the required return, we are satisfied and find that lower rates will not produce the desired result.

The commission has questioned an item of debt of $73,951 against the company said to have once been cancelled but later restored as an obligation of the railway but apparently and inadvertently not entered on the books of account as an obligation.

Governor and Mayor Agree on Chicago Program

Governor Len Small and Mayor William Hale Thompson of Chicago have agreed on a program which may speed settlement of the Chicago transportation problem. Following a conference with the Mayor, Governor Small issued the following statement:

> Our minds have met on the desirability of giving Chicago home rule in the management and control of its traction and transportation problems, and in giving that city full power to negotiate franchises to become a law when approved by a majority vote of the people.

This does not necessarily mean the calling of a special session of the General Assembly to enact railway legislation, as the Governor has stated emphatically that he will not call a session for this purpose until the companies and the City Council are in complete accord on the bills to be enacted.

The Chicago City Council is showing a renewed interest in the transportation question and at the meeting on Feb. 10 was expected to consider the draft of bills proposed by the committee on local transportation. At that time it was also expected the transportation committee's subcommittee would present the draft of a bill providing for the consolidation of the surface and elevated lines. This committee was appointed to analyze the difference between the companies' and the local transportation committees' point of view.

Abandonment of Chestnut Street Tubes in Philadelphia

The city-Philadelphia Rapid Transit agreement for financing and construction of the $20,000,000 Chestnut Street surface-car subway was set aside recently by unanimous decision of the Superior Court of Pennsylvania. In reversing the ruling of the Public Service Commission, which had approved the pact, the Appellate Court held that the title of the ordinance of City Council which embodied the contract was "defective in law." Judge William B. Linn, who wrote the opinion of the Superior Court, said the title failed clearly and sufficiently to express its purpose to grant a perpetual franchise to the Philadelphia Rapid Transit Company to use the subway after expiration of a 50-year lease, or of a sale or gift of the tube to the company upon expiration of the lease.

Civic bodies opposed the city-company agreement on the ground that the transit company, after meeting the carrying charges of the funds borrowed by the city for the construction, was not entitled to take permanent

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possession of the line. Counsel for those organizations also contended the contract was tantamount to the city lending its credit to a private corporation, in breach of the law.

Mayor Mackey said the ruling of the Superior Court would allow for procedure with the construction of a surface-car subway in Locust Street instead, with provision for a hook-up with Camden by means of the Delaware River Bridge.

Consultant on Electric Railway Safety Proposed

The executive committee of the electric railway section of the National Safety Council is considering the employment of a full-time consultant to serve on the Council's staff and help all of the members of the section to prevent accidents on their properties. A committee has been appointed on the subject; consisting of H. K. Bennett, Providence, chairman; E. K. Eastham, St. Louis, Mo., and Melville W. Bridges, Chicago.

The committee has found that it will cost approximately $10,000 a year to finance such a consultant and is asking the various electric railway members of the Council what they think of the plan and how they believe the amount could best be raised.

Public Hearing on Louisville Ordinance

Before action is taken on the bus franchise ordinance Mayor Harrison of Louisville, Ky., will ask the General Council to conduct a public hearing on the measure. The ordinance was released by Mayor Harrison on Feb. 4 and was scheduled for introduction in the lower board at the regular meeting of the General Council on Feb. 7.

The new draft of the ordinance is said to have the approval of the Louisville Railway officials, and unless there is serious objections from the public the measure is expected to pass the Council in its present form.

The ordinance insures a straight seven-cent fare for bus and street cars with interchangeable transfers from rail to motor and half fare for children during the remainder of 1928. It gives the Board of Works power to require the purchaser of the franchise to give bus service where a survey to be made shows such service is needed. The company's suggested ordinance was digested previously in these columns.

Zones Fares Up Five Cents on Tarrytown Line

Local fares for transportation of passengers on the White Plains-Tarrytown Line of the Westchester Street Transportation Company, Inc., are as follows:

Ten cents between the New York Central railroad station in the city of White Plains and the westerly boundary line of the village of Elmsford, and 10 cents between the easterly boundary line of the village of Elmsford and the end of the line in the village of Tarrytown, N. Y. The increase in each zone is 5 cents. The new rates became effective on Jan. 30, 1928.

Results with Five-Cent Loop Operation in Seattle

Since the first of the year patronage on the 5-cent city loop lines of the Seattle Municipal Railway, Seattle, Wash., indicates that a worth-while service is being rendered. As the cost of service is very small if one figures that the platform cost is paid as a guarantee anyway, the experiment will be continued as long as it is warranted.

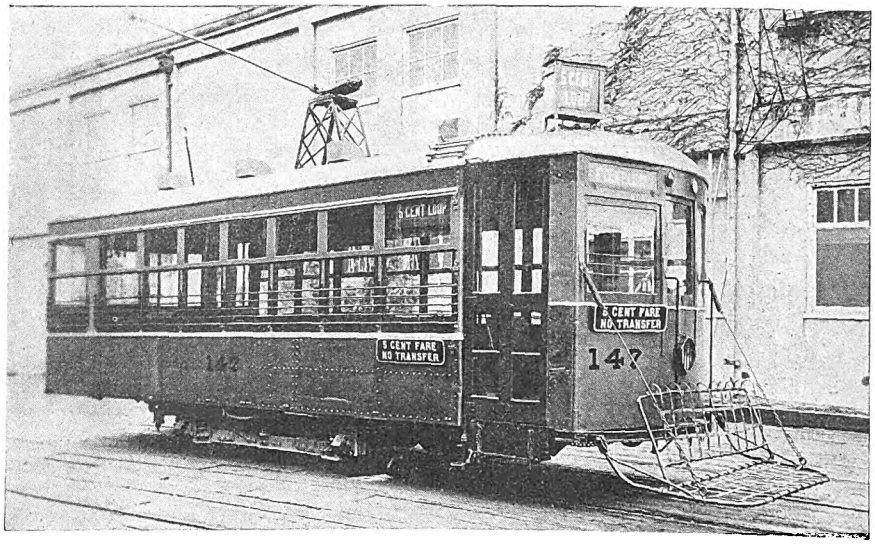
The installation of a service of this kind was debated for a long time. Finally on Nov. 7, 1927, the Municipal Railway began operating ten cars; three on First Avenue, four on Second Avenue and three on Third Avenue over a limited route. These were light-weight Birney one-man cars, and operated from Jackson Street as the south terminus, north on First Avenue, to Virginia Street, north on Second Avenue to Pine Street and east to Seventh Avenue, and north on Third Avenue to Stewart Street.

The fare was 5 cents without transfer privileges, or the regular 8⅓-cent token or 10-cent cash fare, if a transfer was desired. Transfers were accepted from other intersecting lines in the usual way.

Due to extreme peak service required in Seattle, several extra men are employed to operate tripper service who do not get a full day's work. These men are guaranteed $100 to $135 a month, and on this basis it was figured that the platform time on the 5-cent loop cars would cost little or nothing, since they did not go into service until after 9 a.m., and were out of service before 4 p.m., therefore an extra man could work a tripper and a loop car run, making an eight-hour day.

As shown by the accompanying statement, the patronage increased steadily through the Christmas shopping period, but declined during the week following Christmas. This of course was anticipated, but as stated before patronage has picked up since the first of the year.

During the first few weeks of operation, checks indicated that there was not enough patronage on First Avenue to warrant continued service on that street, so the First Avenue line with its three cars was, discontinued on Jan. 2, 1928.



A Loop Line car painted in dark red with silver and orange trimmings

RESULTS OF FIVE-CENT CITY LOOP OPERATION BY THE SEATTLE MUNICIPAL RAILWAY

	Cash	5-Cent Cash Fares	School Fares	8⅓-Cent Tokens	Dead-heads	Transfers	Total Passengers	Total Revenue	Operating Cost Less Depreciation	Car Hours	Platform Wages
First week, Nov. 7–12, 1927	$432.85	8,657	3	324	821	567	10,372	$459.92	$650.16	378	$287.28
Second week, Nov. 14–19, 1927	519.98	10,390	20	385	599	527	11,921	552.44	670.80	390	296.40
Third week, Nov. 21–26,† 1927	424.95	8,499	3	323	541	566	9,932	451.94	559.00	325	247.00
Fourth week, Nov. 28–Dec. 3, 1927	529.35	10,572	27	375	432	646	12,052	560.67	670.80	390	296.40
Fifth week, Dec. 5–10, 1927	531.97	10,631	15	371	384	700	12,101	562.91	670.80	390	296.40
Sixth week, Dec. 12–17, 1927	541.65	10,827	14	379	455	826	12,501	573.31	670.80	390	296.40
Seventh week, Dec. 19–24, 1927	589.27	11,774	20	366	328	656	13,144	621.41	670.80	390	296.40
Eighth week, Dec. 26–31,† 1927	372.03	7,431	16	285	258	514	8,504	395.78	559.00	325	247.00
*Ninth week, Jan. 2– 7,† 1928	425.10	8,502	16	374	529	704	10,125	456.67	447.20	260	197.60
Tenth week, Jan. 9–14, 1928	473.66	9,469	9	397	885	862	11,624	506.64	536.64	312	237.12

* All cars (3) taken off of 1st Avenue Jan. 2, 1928. † Five days.

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Briefs Filed on Discontinuance of Freight Service in Providence

A brief supporting its petition for permission to discontinue its trolley freight service, which, the company claims, has been operated at a loss, was filed on Jan. 31 by the United Electric Railways, Providence, R. I., with the Rhode Island Public Utilities Commission.

Replying to the contention of opponents to the petition that the appeal should have been made to the Interstate Commerce Commission, the brief sets forth that the federal commission has no jurisdiction over electric railways. The transportation act of 1920, the brief states, specifically excludes street, suburban and interurban electric railways from the jurisdiction of the national body in matters of construction and abandonment. Numerous court decisions, including one by Justice Holmes of the United States Supreme Court are cited to prove that a carrier has a right to discontinue any branch of the service after it finds that the branch is being operated at a loss.

Counsel for opponents of the plan filed a brief charging that the company, at a series of public hearings, failed to show that the business was operated at a loss and failed to show there was no public necessity for the service. The opponents say the freight service is necessary to their business.

Numerous Bouquets for Los Angeles Trainmen

If the Los Angeles Railway, Los Angeles, Cal., received any brickbats in 1927 they have been carefully buried, but the bouquets received live in the pictures of the 400 commended trainmen which cover four pages in the Jan. 30 issue of *Two Bells*, the official paper of the railway. Although the figures show that only 402 men were commended through patrons who made it a point to write to the company, the management distributed 4,275 credits for courtesy. Not all these men had a chance to show their faces in the Bouquet Columns of *Two Bells* during the past year.

By-Laws Printed for Supervisors' Association in Boston

Officers of the recently formed Supervisors' Association of the Boston Elevated Railway, Boston, Mass., include J. M. Patten, rolling-stock and shops, president; J. P. Banks, transportation, vice-president; E. L. Doyle, power, vice-president; Thomas Kivell, maintenance, vice-president, and J. L. Troy, transportation, secretary-treasurer. Article I, section 2, in the by-laws states that the object of the association is to promote acquaintance among the men who comprise the supervisory force of the Boston Elevated Railway. The programs of the meetings are partly informational and partly entertainment. Up to date the association has held three meetings and has now a membership of about 300. The leaflet giving the list of officers and by-laws has recently come off the press.

Montgomery Street Minus Toonerville and Track

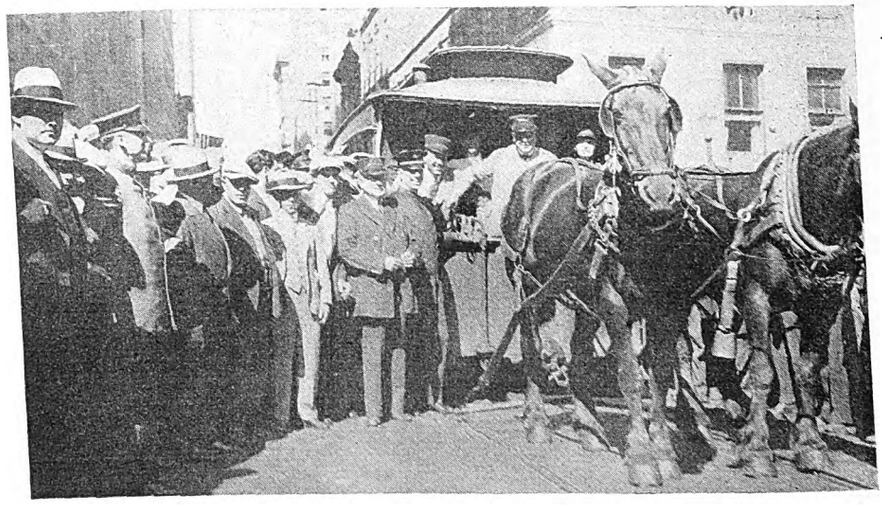
Finis was written to the story of the Montgomery Street line of the Market Street Railway, San Francisco, Cal., on Jan. 20 when pretty Miss Clarice Champion wielded the last pick stroke. It was a significant movement for it meant the scrap heap for the Toonerville Trolley, which rattled down that thoroughfare until last October when the line died. On the day of the last run many mourners gathered and blocked traffic, causing a bigger jam than the hushed dinkies which were accused of choking this "Wall Street of the West."

There were bands and speeches and flags and decorations, and serpentine and ticker tape and snowstorms of paper fluttering down the canyon that is Montgomery Street. And through it wound a strange procession of transportation, with the last of the Montgomery Street "Toonervilles" piloted by none other than Mayor Rolph.

The parade of street cars from the old horse-drawn car to the most modern car built by the Market Street Railway started at Leavenworth and Posts and followed the route of the Toonerville trolley as far as the Russ Building on Montgomery and California Streets.

There was an old stage coach in the lead—right behind the band wagon, that is whence the Municipal band furiously tooted "The Stars and Stripes Forever." Then came the last of the "dinkies," with Mayor Rolph in a Palm Beach suit and a trick motorman's cap at the controller. Behind it came an old-fashioned horse car. There was also an old cable car that hadn't been out on the street since before the fire. And there were two of the ultra-modern street cars that run on Market Street and thereabouts, but that have never dared the trick tracks of Montgomery Street before.

And now three months later the track is yanked up and Montgomery Street is bare of a railway. Miss Champion did a big job!



Mayor Rolph of San Francisco piloting last car over trick tracks on Montgomery Street

Commission Opponents Seek Office in Indiana

Already two well-known politicians, both opposed to present utility laws, are in the field for the nomination for Governor of Indiana, on their respective tickets, Frank Baker, an Indianapolis attorney, is a candidate on the Democratic ticket. He favors the abolition of the Public Service Commission. One of his latest activities in public utility matters was as a representative of the union in its contest with the Indianapolis Street Railway a year ago, for more wages. During the struggle cars were dynamited.

Alvah J. Rucker, another Indianapolis attorney, is a candidate on the Republican ticket. He recently was corporation counsel for Indianapolis. While he hedges on an out-and-out stand for the abolition of the Public Service Commission, he states that he believes the utility regulation laws should be changed so that the municipalities have more to say.

To Guide You on Your Way in Baltimore

The United Railways & Electric Company, Baltimore, is distributing 500,000 copies of a new street car directory. A map showing all street car and bus routes in the city is on one side. This also shows the points of interest in Baltimore. A complete list of all the changes that have been made in routes is given and a complete schedule of the various lines.

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Paving Discussed at Conference

The question of relieving electric railways in cities of the necessity of paving between their tracks and two feet outside was a leading topic at the mid-winter meeting of the New York State Secretaries of Chambers of Commerce Conference held in Rochester, N. Y. The matter was brought before the conference by William J. Russell, secretary of the Queens Borough Chamber of Commerce, who urged that the railways be relieved of this cost by legislative action. The present law, he said, placed "an unjust burden both on street car riders and companies."

Mr. Russell urged adoption by the State Legislature of a bill that would relieve the companies of such paving cost except for 8 or 9 inches on the sides of the rail. Similar bills had been killed in previous sessions, he declared, because of opposition in the State Mayors' Conference. He suggested that if the smaller cities objected to the measure, it be made to apply to cities of the first class only.

The conference took no action on the proposal although it was the subject of lengthy discussion. G. C. Lehmann, secretary of the Buffalo Business Federation, suggested equitable fares as the solution of the paving problem. The people of his city, he said, did not object greatly to a 10-cent fare because the International Railway had, at the time the fare was boosted, started an extensive paving program in collaboration with the city and the public felt the street improvements offset the higher fare.

Suggestions and Complaints to Go Before Bureau

A special bureau for the receipt of complaints about service and suggestions for improvements or changes was recently established in Omaha, Neb., by J. N. Shannahan, president of the Omaha & Council Bluffs Street Railway.

Recommendation on Phoenix Rehabilitation

A report on bids submitted on Jan. 18 for rehabilitation of the municipally-owned railway system at Phoenix, Ariz., and a recommendation by City Manager Henry Rieger that the bid of the Claude Fisher Company, Los Angeles, be accepted and the contract awarded to it, have been submitted to the City Commission.

Mr. Rieger's recommendation was based on the fact that the Claude Fisher bid is considerably lower than the next best bid, there being a difference of more than $92,000 between that bid and the one submitted by Schmidt & Hitchcock, the next low bidder.

The tabulated report on bids, prepared by City Engineer W. J. Jamieson and his staff, shows that only two bids of the 28 submitted were based on rehabilitation of the entire system. These were received from Schmidt & Hitchcock, Phoenix contractors, whose total aggregate bid was $706,381, and from the Claude Fisher Company, whose total bid was $614,113.

Higher Fares Sought in Springfield

The Illinois Power Company, Springfield, Ill., has petitioned the Illinois Commerce Commission for an increase in railway and bus fares. It feels this is the only solution of the problem following the refusal of the city to relieve the company of paying a 4 per cent franchise tax.

A Pass for an "Ad" in Pittsburgh

Sell what you have to sell! Buy what you have to buy! Here's a weekly bargain pass thrown in for good measure! Virtually that is what Pittsburghers were told recently when they visited the new *Sun-Telegraph* want-ad corner at Fifth and Market Streets. A little prepaid want-ad for three consecutive insertions meant the acquisition of a weekly pass worth $1.50, good on the lines of the Pittsburgh Railways.

With the advent of the new year the Pittsburgh *Sun-Telegraph* opened a new want-ad headquarters and as a publicity stunt arranged to give the weekly pass to each person who placed a three-time want-ad with the paper. The railway agreed to allow the paper 10 cents rebate on each pass in return for the publicity which it would receive on the weekly pass sales.

Information is wanting on the buyer of that mole coat to fit a perfect "36" and of the touring car with four new tires and two spares; which bride, or was it a newly-wed couple, that rented the four rooms and kitchenette and what white girl answered the call of the bewildered mother who had two children on her hands and unable to do anything with them? All these the nuclei for absorbing short stories from real life!

Whether there was material aplenty for the imaginative mind at least there were customers enough to engage the services of the want-ad specialists who were in readiness to interview prospective advertisers who visited the *Sun-Telegraph* want-ad corner during the day, after the movies and between shopping tours. The first week 846 passes were distributed and the second week 1,100. Mr. Foster, the want-ad man, commented very favorably on the stunt. While the total sales of weekly passes did not show any noticeable increase valuable advertising was gained for the railway property.

Punishment for Portland Car Bandits

Three street car bandits who held up and robbed several conductors of the Portland Electric Power Company, Portland, Ore., last November, have been sentenced to ten years in prison.

Seattle Appeals to Mr. Von Herberg

Declaring litigation against the city of Seattle, Wash., and the Puget Sound Power & Light Company, instituted and maintained by J. G. Von Herberg had adversely affected the marketability of railway bonds and delayed improvements in the railway system, the City Council has asked Mr. Von Herberg to withdraw his suit.

In reply Mr. Von Herberg said:

Let Mr. Leonard state definitely the conditions upon which he will agree to extend the payment period on the street railway purchase bonds.

A. W. Leonard, president of the Puget Sound Power & Light Company, has repeatedly declared that the only basis upon which his company would consider any extension of the time for paying off the purchase bonds would be contingent upon agreement by the city to reduce from 1 cent a kilowatt-hour to ½ cent, the price paid the city light department for current used by the municipal railway. City officials have been hopeful that Stone & Webster would consent to an arrangement whereby the remaining $10,000,000 in purchase bonds can be paid off in $500,000 annual installments instead of $833,000, the amount now paid annually.

New Group Insurance in Atlanta

Accident and heath insurance is being offered all employees of the Georgia Power Company, Atlanta, Ga., who work on an hourly basis. Through an arrangement with the Metropolitan Life Insurance Company the Georgia Power Company will pay part of the premiums on all insurance, provided 75 per cent of the total number of employees eligible avail themselves of the opportunity. The insurance provides payment for sickness or accident regardless of whether or not the sickness or accident is incurred while on duty. It is offered without medical examination regardless of age, sex, or physical condition. As soon as the insurance becomes effective the employees relief association will be disbanded.

Preliminary Report on New York's Suburban Transit Plan

Anticipating the completion of a comprehensive plan on suburban transit for the metropolitan district of New York, the Suburban Transit Engineering Board has submitted its preliminary report as of Jan. 11, 1928. In 36 pages the report covers the subject of the problem, localizing it in New Jersey, Westchester and Long Island and then going on to the tentative results following the formation of the Suburban Transit Engineering Board. Tentative results deal principally with peak hour travel for passengers delivered inbound by the railroads from Westchester and

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Long Island to Manhattan. This analysis shows that during the most congested hour of the day by far most riders are destined for the terminals located in Manhattan and use additional subway service or elevated facilities to complete their journey.

Preliminary reports are included of the New Jersey sub-committee, Westchester sub-committee and Long Island sub-committee. It is the hope of the board that after careful consideration and exhaustive analyses of data submitted a comprehensive plan will be submitted at the earliest possible date.

Insurance Policies as Gifts Distributed in Gary

Christmas gifts in the form of life and total disability insurance policies totaling $66,600 in principal amount were distributed in December, 1927, to employees of the Gary Railways, Gary, Ind. Twenty-three employees who have been in the company's service for more than six years received paid-up policies of $1,500, and ten others in the service more than four years received paid-up policies of $1,000.

All other employees who had been with the railway for periods from six months to four years received policies of from $500 to $900 each. This is a Christmas bonus plan followed by the company for several years. Under it employees can take out additional insurance at low group rates.

J. M. Yount of Market Street Railway Wins $100

The first prize of $100 for the best articles on advancement in efficiency, accuracy and economy in operation at the Byllesby properties has been awarded to J. M. Yount, vice-president in charge of maintenance and equipment of the Market Street Railway, San Francisco, Cal. Last May it was announced in *Byllesby Management* that three cash prizes would be available to the authors of original articles appearing in the magazine during 1927 which best tended to show these points. Mr. Yount's discussion on street car maintenance and construction appeared serially in *Byllesby Management* during January, February, March and April.

Sixty New Members in Portland's Twenty Year Club

J. G. Mann, superintendent of the Piedmont carhouse of the Portland Electric Power Company, Portland, Ore., was made honorary president of the Twenty Year Club at the annual banquet and party held by the members at the Elks' Club on Jan. 18. He succeeds the late Frederick V. Holman. Sixty new members were voted into the club, the membership of the club now totals 374, all of whom have been with the Portland Electric Company twenty years or more.

Recent Bus Developments

Another Substitution by Morris County Line Approved

Substitution of buses for trolley cars by the Morris County Traction Company between Maplewood and Newark, N. J., was sanctioned on Feb. 1 by the Public Utilities Commission. The approval is subject to condition designed primarily to preserve the line as an express service from Newark to Maplewood and Springfield.

Only a limited number of stops will be permitted in Newark for the purpose of taking on passengers. The fare will be 20 cents, which, the commission points out, will eliminate use of the buses as a local service in Newark. The application was made by Joseph K. Choate and Joseph L. Tumulty, as receivers for the railway, for approval of municipal consents to operate buses through Maplewood, Springfield, Irvington and Newark.

By a decision last August, the board approved the substitution of buses for cars over the portion of the route from Newark to Lake Hopatcong, including intermediate municipalities. Municipal consents were obtained for the operation of twelve buses in Newark and for the operation of buses in Springfield and Maplewood. The rate of fare proposed and sanctioned is 20 cents from Newark to any point as far as the Passaic River Bridge, the boundary between Summit and Chatham.

Objections were interposed to approving the municipal consents by the Somerset Bus Company, the B. & N. Transportation Company and the DeCamp Bus Lines, Inc., together with other independent operators. Inasmuch as the operation of buses is only a substituted service, the board deemed it unnecessary to impose numerous restrictions asked for by objectors whose lines had been established only within recent years.

Bus Matter in Knoxville Goes Over to April

There will be no action until the meeting of the Council in April on the proposal of the Knoxville Rapid Transit Company, Knoxville, Tenn., to establish bus service there in competition with the railway lines of the Knoxville Power & Light Company. This postponement of consideration of the matter is the result of action by the service and the law committees of the Council. By that time it is expected the survey being made by associates of Harland Bartholomew, engineer for the planning commission, will be ready. Councilman Wright said:

> We will all admit that Knoxville needs more transportation routes and facilities, but we all know equally well that the question of bus transportation is new to us. I believe we could all learn a great deal by awaiting the Bartholomew transit report. We shall all then know better how to decide this question.

Jitney Buses Compete with Oklahoma Railway

Jitney buses have started on one route in Oklahoma City, Okla., in competition with the Oklahoma Railway. The company will test the right of its competitor to operate, claiming that the federal injunction secured two years ago against rival bus lines is still operative. City authorities state the City Council has not approved operation of the rival line.

Terminal Planned for Philadelphia

The Philadelphia Rapid Transit Company announces that it intends to use the old public school building site at Fifteenth and Locust Streets for a terminal for its own buses with facilities for the parking of private automobiles. It also has plans for a garage and bus terminal near the northern end of the Broad Street subway. This project is to serve the same purposes which are performed in part by the parking areas in West Philadelphia and in Frankford. The terminal will cost $2,000,000. It will be equipped to take care of buses, taxicabs and automobiles. Surface cars and motor bus feeders will loop the proposed terminal at the northern end of Broad Street.

Perfect Safety Scores in Youngstown

Thirty-three drivers of the Pennsylvania-Ohio Coach Lines, a subsidiary of the Pennsylvania-Ohio Electric Company, Youngstown, Ohio, had perfect safety records in the second half of 1927. Not one had a chargeable accident. Twenty-two of these men had perfect scores for the entire year. Eight others, some of them in the service less than six months, went throughout the last three months of 1927 without a chargeable accident. Gold buttons will be presented to the men who had no accidents during the year and certificates to those who had no accidents in the six-month period.

Stage Service for Orange Show in San Bernardino

The Pacific Electric Railway has applied to the California Railroad Commission for authority to operate auto stage service from the Pacific Electric station at San Bernardino to the National Orange Show Building in that city during the period of the show each year.

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Financial and Corporate

Deal for Indianapolis-Cincinnati Road Reported

William L. Taylor, attorney for the Central Union Trust Company, New York, trustee of the bonds of the Indianapolis & Cincinnati Traction Company, Rushville, Ind., has confirmed the report that a deal for the property is under consideration. According to Mr. Taylor, C. T. DeHore and associates, Toledo, are seeking to purchase all outstanding bonds of the company and its subsidiaries, following which they would bid the property in at foreclosure as bondholders. The property has been in receivership for three years.

The company owns and operates 104 miles of main electric interurban track between Indianapolis and Connersville and Indianapolis and Greensburg, Ind. It owns its own power plant and its own right-of-way between these cities. It is understood that Mr. DeHore and his associates plan to extend the line to Cincinnati. The road was built by the late Charles L. Henry.

Kentucky Railway Included in Deal

Sale of the controlling interest of the Kentucky Power Company and the Maysville Public Service Corporation and their subsidiaries to the United Public Service Company, Chicago, has been confirmed by Barrett Waters, president of the Kentucky Utility Companies. The properties, which supply power to the greater part of Northern Kentucky and include the Maysville Street Railroad & Transfer Company, Maysville, Ky., and the Kentucky Engineering Company, the latter at Augusta, are valued in excess of $4,000,000, according to Mr. Waters.

Hearing on Kansas City Bonds Concluded

Arguments on the appeals filed by second mortgage bondholders of the old Kansas City Railways, Kansas City, Mo., which was purchased by the Kansas City Public Service Company from the order lifting the receivership in June, 1926, were recently concluded in St. Louis before the United States Circuit Court of Appeals.

The appeals were based on the objections of the second mortgage bondholders and the preferred stockholders. They contended that the federal court order turning over the property to private ownership failed to give them a fair representation in the new company on the basis of their securities in the old one.

Blatchford Downing declared no provision was made in the reorganization plans for either the holders of $5,000,000 of second mortgage bonds of the old company or for the stockholders. He declared that the provisions made by the reorganization plan for first mortgage stockholders and unsecured creditors holding damage claims amounting to more than $2,500,000 who were practically paid in full, was in effect a diversion of the funds due the holders of second mortgage bonds and the stockholders.

Increase in Preferred Stock of Philadelphia Rapid Transit

The Philadelphia Rapid Transit Company will shortly apply to the City Council for the right to issue $5,000,000 of 7 per cent preferred stock. $1,500,000 of this money will be used to put the Market Street subway tracks straight through under City Hall. About $2,000,000 will be used for a bus, taxicab and automobile-garaging terminal at Fifteenth and Locust Streets. About $1,500,000 will be used for a garaging terminal at the Olney Avenue end of the Broad Street subway, where provision will be made for street cars, buses, taxicabs and automobiles.

Gross Revenue of Chicago Surface Lines Higher in December

In spite of a decrease in total passengers carried, gross revenue of the Chicago Surface Lines was higher in December, 1927, than for any other month last year. The gross earnings of the system last December were $5,365,172 compared with $5,133,348 in November and $5,417,666 in December, 1926. Due to a reduction in operating expense the divisible receipts in December exceeded both those of November and December 1926.

Revenue passengers handled in December, 1927, totaled 137,135,000, a decrease of 390,088 compared with rides reported for December, 1926. During the week before Christmas, 1927, there was a gain of 2,500,000 passengers over the number carried in the similar week of 1926.

Another Loan Bill Appears in Seattle

A temporary loan of $550,000 to the City Railway fund from the Municipal Light Extension bonds 1926 construction fund is provided in a bill introduced at an adjourned meeting of the City Council of Seattle, Wash. A bill providing for a temporary loan of $400,000 from the light fund to the City Railway fund was introduced at an earlier meeting of the Council. Both bills are now in the hands of the finance and the city utilities committees.

Maryland Commission Values Easements

Explains means of determining allowance to be given to this form of property of Baltimore Company

AS MENTIONED in the ELECTRIC RAILWAY JOURNAL for Feb. 4, the Maryland Public Service Commission has placed a valuation of $5,000,000 on the "easements" of the United Railways & Electric Company, Baltimore. The publication of the full opinion shows how the body reached this valuation.

The term "easements," as used in Baltimore is somewhat unusual. An extended explanation of the meaning of the term was given by the late W. G. Maltbie, special counsel of the company, on page 74 of the issue of this paper of Jan. 9, 1926. Briefly, it means a tangible interest which the company owns in the space on the streets occupied by its cars while in operation. Under the Maryland law the easement value is distinct from and in addition to the franchise value, or the right of the company to operate cars. The Maryland courts have held that such easements are property and subject to taxation. The company naturally claims that their value should be included in valuations for rate-making purposes.

Originally the company placed the value of its easements and private rights-of-way at between $18,000,000 and $19,000,000. This figure was cut by the Maryland Public Service Commission to $7,000,000, but on the claim of the people's counsel, this figure was disallowed by the Maryland Court of Appeals on the ground that it has been fixed, at least in part, on the basis of the earnings of the property. This method, the court held, was erroneous because: "The greater the earnings, the larger the value of the easements. The greater the value of the easements, the larger the fare returns that must be allowed on such value." The case was therefore remanded for determination without consideration of this element.

In announcing its revised value of $5,000,000 the commission explains the method by which this figure was determined and points out that earning capacity is in no way a factor. Briefly, the easement strip is considered as real estate and its value determined by comparison with that of adjacent real estate. To this value, a so-called percentage-use factor is applied, on the theory that while the cars use the streets, other vehicles do also. This percentage-use factor by the railway is taken as 25 per cent where the rights of the company are not exclusive. In this way a total of $5,113,632 was obtained as the approximate value of easements and private and semi-private rights-of-way. For the purposes of the present valuation this sum was taken as $5,000,000. As the commission had previously found the value of the property, exclusive of easements, was $70,000,000, as of Dec. 31, 1923, it placed the total value of all property, including easements, at $75,000,000 as of the date mentioned.

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Counsel Attacks Holding Company Plan at St. Louis

Former Judge Henry S. Priest, counsel for the Tilles Non-Sectarian Foundation Fund, a minority stockholder of the St. Louis Public Service Company, on Jan. 23 asked the Missouri State Public Service Commission for permission to intervene in the hearing on the application of the City Utilities Company for permission to hold more than 10 per cent of the stock of the railway.

Mr. Priest, formerly counsel for the defunct United Railways, in a letter to City Counselor Muench assailed the explanation given recently by Stanley Clarke, executive vice-president of the railway, that the holding company could greatly aid the operating company in financing and other problems as an "impeachment of the local management," and further said that explanation of financial aid was ridiculous. Mr. Priest said:

> Its resources are invested in the stock of the domestic company, and if the direct obligation of the domestic company, supported by all its assets were not available for credits, surely its shares of stock alone would not be appealing.
>
> On its face it appears to be a device for pensioning some of the favorites of the foreign corporation at the expense of the domestic company.

City Counselor Muench of St. Louis, Mo., in a motion filed with the Missouri Commission charged that if the application is granted the holding company could obtain virtual control of the operating company and create obligations of its own with the stock and securities of the St. Louis Public Service Company as collateral without any supervision from the commission or other Missouri officials.

Sale of Electrical Equipment Approved

Stockholders of the Stark Electric Company, Alliance, Ohio, approved proposed action of the company's directors to sell electrical equipment to the Alliance Power Company, at an annual meeting held at Alliance. Approval was given after the stockholders had heard an optimistic report on 1926 operation. The sale has been approved by state officials.

Foreclosure Case at Chicago to Be Pleaded in June

Recent reports that foreclosure proceedings will be initiated against the Chicago Railways were confirmed on Jan. 21, when James H. Wilkerson, judge of the Federal District Court of Chicago, instructed attorneys for the company and for the various security holders' protective committees to be prepared to plead their cases at a trial next June. The Chicago Railways operates the north and west side surface lines. It has been in receivership under the jurisdiction of Judge Wilkerson's court since its twenty-year franchise expired last February and the payment of principal and interest on its bonds was defaulted. Henry A. Blair, J. J. Mitchell and Fredrick Rawson were appointed co-receivers at that time by the federal court.

The suit will not interfere with the franchise negotiations between the Surface Lines and the city, according to Attorney H. K. Tenner, who represents the Chicago Railways first mortgage bondholders.

Two New Directors Added to West Penn Electric Board

At meetings of the boards of directors of The West Penn Electric Company, West Penn Power Company and West Penn Railways, held on Dec. 7, 1927, W. C. Robinson, Pittsburgh, was elected a director. Mr. Robinson is president and a director of the National Metal Molding Company and is also a director of The Union Trust Company of Pittsburgh and the Mellon National Bank.

At a meeting held in New York on Jan. 4, 1928, Thomas H. Blodgett was elected a director. Mr. Blodgett is president of the American Chicle Company, New York.

Progress Reported on Washington Merger Negotiations

Negotiations for bringing about a merger of the Washington Railway & Electric, the Capital Traction and the Washington Rapid Transit companies have been resumed by committees representing the three companies and their counsel.

It has been emphasized that a merger of the Potomac Electric Power Company with the railway utilities is positively forbidden by an act of Congress and its consolidation with the railway companies, therefore, has never been discussed in the conferences.

Sale of Morris County Traction Confirmed

Federal Judge Runyon has confirmed the sale of the property of the Morris County Traction Company to its bondholders for $280,000. The railway, since replaced by buses, was sold under foreclosure at Morristown on Oct. 31, 1927.

Following the purchase, negotiations were consummated with the Public Service Transportation Company to replace the trolleys with buses, and this service between Newark and Morristown, was started Feb. 5.

The Public Service, it is said, will become owner and operator of the line.

New Director in Columbus

Lyle Babbitt has succeeded H. S. Holton as a director of the Columbus Railway, Power & Light Company, Columbus, Ohio.

Baltimore Company Passes Dividend to Conserve Cash

Directors of the United Railways & Electric Company, Baltimore, have passed the current quarterly dividend. It was explained by Charles D. Emmons, president of the company, that the action was taken because the dividend was not fully earned, the surplus in 1927 applicable to dividends being equivalent to $1.17 a share, while the disbursement called for $2 a share. The amount available for dividends was $682,000, or $136,446 less than the amount required. During the year ended Dec. 31, 1926, the dividend was earned by the company with $196,606 to spare.

President Emmons pointed out that the company's operating costs, materials, wages and taxes have doubled since before the war while fares have increased less than 50 per cent. The public pays twice as much for nearly everything it uses, he said, but this is not true of car fares. He said:

> The company tried to live on a lower fare, but additional increased costs, accompanied by falling off in traffic, compelled the company to apply for relief to the Public Service Commission. The rate case was necessarily, in the public interest, a long and exhaustive one before relief could be granted, and it became necessary to take the action we did.

The statement of income of the company for the year ended Dec. 31, 1927, before adjustment of books for both 1927 and 1926 is as follows:

	1927	Increase
Passenger revenue	$15,956,013	*$527,909*
Other revenue	233,727	1,941
Totals	$16,189,741	*$525,967*
Operating Expenses:		
Way and structures	$841,535	*$17,328*
Equipment	907,550	*1,136*
Power	1,387,832	*63,964*
Conducting transportation	5,143,117	*71,305*
Traffic	15,474	11,136
General and miscellaneous	1,535,354	12,058
Transferred for investment—Cr	16,025	*1,445*
	$9,814,839	*$131,994*
Depreciation	809,487	*26,298*
Totals	$10,624,326	*$158,293*
Net operating revenue	$5,565,415	*$367,674*
Taxes	1,593,143	*95,253*
Operating income	$3,972,271	*$272,421*
Non-operating income	159,230	34,086
Gross income	$3,131,502	*$238,334*
Fixed charges	2,889,315	64,427
Remainder	$1,242,187	*$302,762*
Interest on income bonds	560,000	.....
Net income	$682,187	*$302,762*

The net income by months was as follows:

	1927	Increase
January	$72,128	$1,992
February	27,590	*15*
March	81,509	*21,408*
April	61,000	*20,048*
May	63,529	*41,331*
June	41,721	*31,539*
July	36,370	*33,541*
August	20,849	*39,779*
September	38,691	*40,596*
October	72,738	*21,396*
November	74,379	*20,695*
December	91,678	*34,400*
Totals	$682,187	*$302,762*

From the 1927 net must be deducted the whole or part of $240,000 in final adjustment for accident and power accounts.

Italics denote decrease.

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Balance of New York State Railways $308,565

"I firmly believe that conditions will improve from now on and that securities of conservatively operated traction lines serving the larger municipalities will again gain favor with the investing public." With these words did James F. Hamilton, president of the New York State Railways, Rochester, N. Y., submit the annual report to the stockholders. The balance for the year ended Dec. 31, 1927, for dividends and surplus, as shown in the accompanying report, was $308,565 against $497,403 for the year previous.

SUMMARY OF OPERATIONS OF THE NEW YORK STATE RAILWAYS—YEARS ENDED DEC. 31

	1927	1926
Railway operating revenues	$9,879,150	$10,351,484
Railway operating expenses	7,058,067	7,263,755
Net revenue railway operations	$2,821,083	$3,087,728
Taxes	596,565	659,422
Operating income	$2,224,517	$2,428,306
Non-operating income	122,955	37,698*
Gross income	$2,347,472	$2,390,607
Deductions:		
Interest on bonds	$1,290,294	$1,292,994
Other interest and deductions	218,086	243,606
Total deductions	$1,508,381	$1,536,601
Net income	$839,090	$854,006
Appropriations:		
For sinking fund	$30,525	$31,603
For depreciation reserve	500,000	325,000
Total appropriations	$530,525	$356,603
Balance for dividends and surplus	$308,565	$497,403

*Adjustment of excess of specified return under service-at-cost contract, City of Rochester.

The company entered into an agreement with the City of Rochester to operate the new subway railroad constructed by the city at a cost of upwards of $12,000,000. Under the terms of this contract the company is to provide the necessary rolling stock for passenger and freight service and pay the cost of operation and maintenance, after which any surplus or deficit is to be applied as provided in the existing service-at-cost contract which governs this service. The city assumes all interest and other fixed charges including taxes. In conjunction with this arrangement, agreements are being entered into with the various steam railroads entering the city providing for the movement of freight cars to and from commercial sidings located on the subway railroad and also the transfer cars from one railroad to another.

COMBINED SUMMARY OF OPERATIONS OF AFFILIATED BUS COMPANIES OF NEW YORK STATE RAILWAYS—YEAR ENDED DEC. 31, 1927

Gross revenues	$601,362
Operating expenses	532,968
Net operating revenue	$68,393
Taxes	13,129
Operating income	$55,264
Deductions	18,613
Available for depreciation and surplus	$36,650

In order to protect its interests and to avoid heavy expenditures incident to the construction of track extensions necessary to supply demands for service in outlying districts, the New York State Railways started auxiliary bus service to supplement and extend its trolley service in and about the cities in which it operates. The company's investment in bus lines amounted to approximately $650,000 on Dec. 31, 1927. In addition to furnishing service to outlying districts the establishment of cross-town bus lines in the City of Rochester has permitted the discontinuance of unprofitable long-haul trolley operation without loss of traffic. The revenues from operation of buses amounting to $600,000 are not included in those of the New York State Railways but are set out in a separate statement.

Due to the company's inability to finance capital expenditures through the issue and sale of its securities it has been necessary for several years past to use all available funds for that purpose, and this accounts for the deferment of dividends on the company's preferred stock.

The report referred to the enforcement of more stringent parking regulations in the business centers and said this must react to the benefit of city railway lines. Mr. Hamilton also mentioned the possibility that the present paving law would be amended to relieve the electric railways of at least part of this unfair burden.

3.91 Miles in New Hampshire to Be Abandoned

The New Hampshire Public Service Commission has granted authority to the Massachusetts Northeastern Street Railway to abandon 3.91 miles of track in Plaistow and Newton. Unprofitable operation was claimed.

Kansas City Bonds For Sale

The Kansas City Public Service Company, Kansas City, Mo., has applied to the Missouri Public Service Commission for authority to issue $2,634,000 of first mortgage gold bonds, series A. These are to be sold for not less than 88 per cent of par value and the proceeds will be used to refund obligations of the company.

Subscribers in Providence From Ranks of Employees

Employees of the United Electric Railways and the Narragansett Electric Company, Providence, R. I., have subscribed to $701,700 or 6 per cent cumulative preferred stock in the New England Power Association. The subscription price was $100 per share. Employees will pay in installments of $2 a share per month, deducted from the subscriber's salary.

Would Discontinue Line in Santa Barbara

The Santa Barbara & Suburban Railway has applied to the California Railroad Commission for permission to discontinue operation of its State Street bus line run in the city of Santa Barbara.

Collateral Trust at Chicago Reports Loss

The Chicago City & Connecting Railways Collateral Trust, Chicago, Ill., reports for the year ended Dec. 31, 1927, net loss of $1,077,844 after charges. This loss is due to the fact that with the expiration of their franchise, the Chicago City Railway and the Calumet & South Chicago Railway stopped payment of dividends on Feb. 1 last. B. E. Sunny, chairman of the protective committee, states the companies have set aside for the benefit of stockholders the equivalent of the dividends not paid.

Stock Reduction in Wisconsin Company

An 80 per cent stock reduction was voted at the annual stockholders meeting of the Wisconsin Rapids Street Railroad, Wisconsin Rapids, Wis.

Earnings of Eastern Massachusetts Fluctuate

Receipts of the Eastern Massachusetts Street Railway, Boston, Mass., last December were almost $100,000 less than in the corresponding month in 1926, whereas the receipts in December, 1926, were about $95,000 higher than in December, 1925. Last December there was no snow, so that the company had no snow expenses, but people were operating their automobiles and did not use the street cars. During December, 1926, however, there was so much snow that automobiles were not used to the usual extent.

During 1927 the Eastern Massachusetts earned its dividend requirements on the first preferred and on preferred B stock, but failed by about $93,000 to earn the $5 a share paid on the 86,842 shares of adjustment stock, so that the net available for dividends on this issue was only $4 a share. The net income of $772,060 available for dividends in 1927 was greater than that of either of the two preceding years. Operating revenues decreased $190,000, but there was an increase in net of $37,000 over the previous year.

New Director on Atlanta Board

Andrew C. Erwin was recently elected to the directorate of the Georgia Power Company, Atlanta, Ga., to succeed the late J. P. Phinizy. Mr. Erwin is a prominent business man of Athens. He is well known in the public affairs of the state.

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Book Reviews

In Retrospect

Conspicuous in the land of books in 1927 affecting public utilities was the production of reading matter relating to finance. This, of course, is indicative of the present day need for a thorough understanding not only on the part of utility managements but also on the part of the layman of the principles involved in speculation, stock ownership, profit sharing, accounting practices, and depreciation. One brave ameliorist, Professor William Z. Ripley, caused a stir with his "Main Street and Wall Street" (Little Brown & Company). However, he is no more intent upon rectifying certain corporate practices than are many exponents of the industry itself. From his comments something can be gleaned. Again, much can be gained from a perusal of "The Principles of Bond Investment" (Henry Holt & Company) by Chamberlain and Edwards. This work is popularly known as "The Bible of Wall Street." Here is finance brought up to date after a trying period of war, radical changes in the taxation system and the wholesale weeding out of passé stock.

"The Claim Agent and His Work" by Smith R. Brittingham (Ronald Press Company) deserves the attention of electric railway managers. But by far eclipsing the rest of the crop in volume, interest and perspective is Martin G. Glaeser's "Outlines of Public Utility Economics" (Macmillan Company) with its comprehensive task of presenting the economic problems of all of the public utilities taken as a group. The author is a professor of economics at the University of Wisconsin and research associate, Institute for Research in Land Economics and Public Utilities.

In addition to the volumes covering general engineering subjects, business conditions, wages, employment, economics and the like, there were a few which appealed to popular fancy in the industry. For his observation on the American workman, the reviewer reached a rapprochement with André Siegfried in "America Comes of Age" (Harcourt, Brace & Company). All protagonists of American industry would find both pleasure and enlightenment in this discerning Frenchman's views. The story of business a generation ago with its unbridled rivalry is told in "Captains in Conflict" (A. W. Shaw Company). Here is an epoch in business in the making which might serve as inspiration to the present-day leaders.

Another book in somewhat lighter vein is Frank Folupa's "Notes on the Collection of Transfers" (Dorrance & Company). The reader may not be a "peridromophile," but he would probably be amply repaid for time consumed on reading about the habit of collecting transfers.

These books and numerous others were reviewed in the ELECTRIC RAILWAY JOURNAL in the second issue of each month, during the past year. Reference can be made here to only a few of them, but it has been the desire to satisfy all types of readers. In some respects the task was as difficult as that which confronted the essayist who was to pick stories to please three old ladies at one and the same time. The first lady was practical, the second was fond of fun and the third was romantic.

Heinrich Bussing und Sein Werk

(Henry Bussing and His Work)—25th anniversary publication, by the Automobilwerke, H. Bussing A. G. Braunschweig, Germany, 92 pages of text and 262 illustrations.

Mr. Bussing's work during the past twenty-five years has been the manufacture of buses and commercial cars. So well has he done this work that his name is known throughout Europe and only to a lesser extent in America. The present volume is in part historical and in part relating to the Braunschweig Works. Most of the book, however, is devoted to particulars of recent designs which vary all the way from ice wagons to luxurious double-deck touring buses. The book is beautifully printed and bound.

Five Thousand Sheet Steel Products and Who Makes Them

Sheet Steel Trade Extension Committee, Pittsburgh, 445 pages, price $3.

The book is essentially a directory of sheet steel products and fabricators. The compilers of it advise that "heretofore there has been no publication of any kind to which one could turn to find all of the manufacturers of sheet steel, all of the fabricators of products made from sheet steel, and the names of these products."

The cover of the new book is done in blue, silver and gray. In addition to the preface, the table of contents includes the following: "Brief History of Iron and Steel"; "U. S. Standard Weights and Gages for Iron and Steel Sheets"; "List of Simplified Types, Gages and Size of Sheets"; "Manufacturers of Sheet Steel with Index to Their Advertisements"; "Fabricators—Alphabetical List of"; "Fabricators—Alphabetical List by States"; "5,000 Sheet Steel Products and Who Make Them"; and "Sheet Steel Products with Index to Fabricators Who Make Them." The brief history of iron and steel contains more than a dozen illustrations. This useful and handy directory is calculated to find a welcome place in business libraries and on the desks of purchasing executives.

Electric Control Gear and Industrial Electrification

By William Wilson, M.Sc., B.E., M.I.E.E., A.A.I.E.E. Oxford University Press, London, England. 362 pages. Price $8.50.

Extensive use of electricity for driving shop tools has led the author to compile a volume on the control apparatus itself. Special attention has been given to present the information in such a form as to be understood readily by the type of engineer usually connected with this work. The book, however, is concerned primarily with the design, arrangement and construction of the controlling apparatus. Each chapter as far as possible is complete in itself and can be read and understood independently of those that come before and after. Diagrams used are made easily intelligible.

Readers who are studiously inclined have been kept in mind and certain specialized sections have introductions to familiarize the reader with the subject and so not require reference to other text books.

The book is well illustrated and gives examples of various installations. There are 23 chapters and numerous tables. Chapters on electric crane and control systems for them and upon machine tool control should be of particular interest to electric railway shop men.

Trade Association Activities

Bureau of Foreign and Domestic Commerce, Department of Commerce—Superintendent of Documents, U. S. Government Printing Office, Washington, D. C.,—383 pages—75 cents.

Secretary Herbert Hoover covers the purpose of the government when in the foreword he says that the purpose of this and the 1923 volume on Trade Association Activities is to indicate the successful service of trade associations in public interests. That in the field of scientific and economic research, in statistics, in simplification and standardization of commodities, in the promotion of arbitration in commercial disputes, in development of foreign trade, and in scores of other directions, trade associations have made a valued contribution to economic progress.

The publication discusses in detail the following phases of trade association activities: the organization problems of trade association and the way in which these are commonly met; the legal status of the statistical activities of trade associations; service of trade associations in promoting uniform cost accounting; the encouragement of cooperative research by trade associations; simplification and standardization in industry; public relations and co-operative advertising; trade relations and arbitrations; and a detailed treatment of trade associations in connection with the industries which they represent. The text closes with an outline of the vast number of contacts which trade associations maintain with the federal government.

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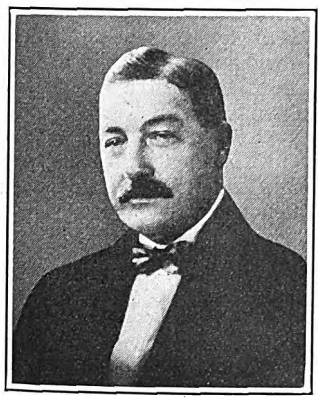
Personal Items

A Record Holder

"Bob" O'Brien of New Orleans heads Association of Equipment Men Southern Properties, which he helped to found

ELECTION of Robert M. O'Brien to the presidency of the Association of Equipment Men, Southern Properties, at the recent meeting of that organization in New Orleans marks the elevation to that post of another of the small group of far-sighted Southern equipment men, who in 1922 conceived the idea of organizing to interchange ideas on practices and to compare costs so as to stimulate improvement in their own performance. Mr. O'Brien, New Orleans, joined forces with A. D. McWhorter, Memphis, W. H. McAloney,



R. M. O'Brien

Atlanta, and A. Taurman, Birmingham, and the association was born which has since grown to proportions undreamed of by its founders.

"Bob" O'Brien has been the storm center of discussion throughout the South ever since he proceeded to romp off with the honors in the Southern Association's pull-in contest. At first there was general scepticism regarding New Orleans' performance. Then the Southern Association adopted a rigid definition of a pull-in, but New Orleans continued to lead by a wide margin. In addition to having what is probably the lowest pull-in record in the country, New Orleans has an equipment maintenance cost that is well down below the average.

One looks in vain for spectacular "stunts" that might explain this performance. There are none, except that for the 39 years "Bob" O'Brien has been with the New Orleans Public Service Company and its predecessors, he has pounded away at the work of gradually developing one central idea regarding the maintenance of electric railway equipment until it has permeated to the lowliest man in his department. "Our business is so to maintain equipment that it will not fail in service—not to repair it after it has failed," he insists. That's all there is to it, except that Bob stays close enough to the job to see that this idea is put into practice.

"Bob" O'Brien has lived in New Orleans all his life. He is now 54 years old, but he has worked for one company since he started as a lad of fifteen in the power house of the old Louisiana Electric Light Company. After four years he was in charge of the company's meter department as foreman, but in 1893 he went into the Arabella Station of the New Orleans City & Lake Railway as a car doper. In 1894 he became night foreman of the Poland car station. In 1898 he moved up a notch as day foreman. In 1901 the New Orleans Railway & Light Company was formed by consolidation and in 1907 "Bob" became foreman of Claiborne station. A year later he was moved to a similar position in Arabella station, the largest house on the system, and in that same year became inspector of equipment. In another year he became assistant superintendent of the railway, and in 1913 was made superintendent of equipment by M. S. Sloan, then general manager of the property at New Orleans.

The entire department of which he is the head is concerned primarily with maintenance work, but during the past several years a staff of young engineers has been developed in his department to supplement and reinforce the practical maintenance forces. Mr. O'Brien is a firm believer in eliminating all manufacturing activity from a maintenance shop, on the principle that home manufactured parts are false economy. As president of the Association of Equipment Men, Southern Properties, he may be expected to support the principle that since the manufacture of electric railway parts is work for specialists, the operating executive should concentrate on getting the best possible performance from equipment instead of going into competition with the manufacturer, who is trying to help reduce costs.

C. E. Mitten Goes to Philadelphia

Clarence E. Mitten has been transferred to Philadelphia, Pa., to take charge of the new business department of the Philadelphia Rapid Transit Company and associated companies. He has been passenger traffic manager of the International Railway at Buffalo since early last year. In that capacity he handled both electric and bus transportation and reported direct to President Yungbluth. Mr. Mitten went to the International Railway organization from the Chicago & Eastern Illinois Railroad where he had twenty years of experience. In that organization his last position was assistant superintendent of transportation.

Simon Glerum Is Advanced at Grand Rapids

At the annual meeting of the directors of the Grand Rapids Railroad, Grand Rapids, Mich., in January a new office was created, and in recognition of twelve years of faithful and efficient service Simon Glerum was chosen for the new place, assistant secretary and assistant treasurer.

Mr. Glerum has filled many positions with the Grand Rapids company. From stenographer in the general offices he advanced until he became private secretary to L. J. DeLamarter, vice-president and general manager. In all of these positions Mr. Glerum has proved his efficiency, loyalty and courtesy, says Mr. DeLamarter. He is well known in the industry.

Mr. Glerum was born in Grand Haven, Mich. He was graduated from the local public schools and was former

Simon Glerum

private secretary to Congressman Carl E. Mapes of Michigan. This early training gave him a good foundation on which to build and his application to his duties with the railway operating in Grand Rapids has commanded the regard of the directors.

East St. Louis Roads Elect

F. W. Doolittle, New York, was elected president of the East St. Louis & Suburban Railway, East St. Louis, Ill., Jan. 24 at the annual meeting of the board of directors in East St. Louis. Other officers elected or re-elected were: G. W. Welsh, vice-president; T. W. Gergory, vice-president and secretary; R. Sealy, New York, treasurer; Lieut.-Col. Frank L. Reardon, assistant-secretary and treasurer; F. H. Piske, New York, assistant secretary; Miss Eugenia E. Sunkel, assistant treasurer. The same officers were also named by the directors of the St. Louis & Belleville Electric Railway and the St. Louis & Alton Railway, subsidiaries.

Mr. Doolittle, for a long time vice-president of the North American Company, which controls the East St. Louis Company, succeeds W. H. Sawyer as president. Mr. Sawyer resigned as president on Oct. 14 to become president

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of Stevens & Wood, Inc., of New York. Following the resignation of Mr. Sawyer, Mr. Doolittle assumed the duties of president. A biography of Mr. Doolittle was published in the ELECTRIC RAILWAY JOURNAL, issue of Oct. 22, 1927, page 806.

The action taken by the directors of the railways at the annual meeting changes the status of T. W. Gregory, formerly vice-president and assistant secretary; Lieut.-Col. Frank L. Reardon, formerly assistant treasurer, and Miss Sunkel, formerly secretary to Vice-President Gregory.

Mr. Gregory, newly elected secretary, has been with the affiliated companies since 1902. He was appointed receiver of the Alton, Granite City & St. Louis Traction Company in December, 1925, and receiver of the Alton Gas & Electric Company on Dec. 22, 1925.

After his re-election as vice-president of the railways G. W. Welsh was appointed general manager by the president, giving him the title of vice-president and general manager. Mr. Welsh was with the General Electric Company from 1901 to 1905, in the testing department, specializing particularly in electric railway operation. From 1905 to 1909 he was with the New York Central Railroad in connection with the electrification of the Grand Central Terminal in New York City. Subsequently he worked with the Southern Pacific Company, San Francisco, on the electrification of suburban lines on the eastern side of San Francisco Bay, in Oakland and Berkeley. In this endeavor he was employed from 1909 to 1914.

Miss Sunkel was the first woman employee of the East St. Louis railways. She began as assistant cashier 24 years ago. Later she held various posts in the accounting department and has been secretary to Vice-President Gregory for ten years. She will be eligible next year to membership in the Twenty-five Year Club and will be the only woman member of that organization for several years to come.

William Stewart at Omaha

William Stewart has accepted the position of private secretary to J. N. Shannahan, president of the Omaha & Council Bluffs Street Railway, Omaha, Neb. Mr. Stewart entered the railway field in 1899 as chief clerk in the signal and maintenance of way departments of the New York Central & Hudson River Railroad at Albany, N. Y., in which capacity he served until 1901, when he accepted a position as purchasing agent and secretary to the general manager of the Fonda, Johnstown & Gloversville Railroad at Gloversville, N. Y. From 1907 to 1912 he was purchasing agent and secretary to the general manager of the Washington, Baltimore & Annapolis Electric Railroad, Baltimore, Md. On Jan. 12, 1912, he was elected secretary and treasurer, as well as purchasing agent of the Newport News & Hampton Railway Gas & Electric Company at Hampton, Va., now known as the Virginia Public Service Company.

Westinghouse Executives Promoted

W. J. Longmore has been transferred from the office of general purchasing agent of the Westinghouse Electric & Manufacturing Company to consulting supervisor of purchases; E. R. Norris, from director of works equipment to general works manager of all manufacturing operations; A. W. Bass, from director of works records and statistics to assistant to the vice-president; S. E. Marks, from director of traffic and shipping to director of traffic; and C. G. Taylor from director of purchases to general purchasing agent.

Mr. Longmore is a veteran of the company, being perhaps the oldest in continuous service. He entered the employ of the Westinghouse interests in 1881 as a laborer.

Mr. Norris began his connection with the company in 1892 as a general mechanist at the Newark works.

Mr. Bass has had a wide experience outside the company. In 1921 he was made director of works records, the position he held until his recent promotion.

Mr. Marks entered the employ of Westinghouse in 1891 in the purchasing department.

Mr. Taylor became connected with the Westinghouse Company in 1887.

D. F. Miner has recently been appointed manager of material and process enginering department of the Westinghouse Electric & Manufacturing Company. Mr. Miner was first employed by the company in 1919 as an assistant to the section engineer of the electrical section. Since 1920 he has served in the capacity of section engineer of the experimental section of the material and process engineering department.

Allyn B. Tunis Will Direct Virginia Information Bureau

Allyn B. Tunis will direct the recently organized Virginia Committee on Public Utility Information, with headquarters in Richmond, Va. Mr. Tunis knows the newspaper and publicity business. He first worked as a reporter on the *Ledger-Dispatch* at Norfolk. Later he became city editor of the *Times-Dispatch* at Richmond. For two years he was on the copy writing staff of Cecil, Barreto & Cecil, Inc., advertising agents of New York and Richmond. Mr. Tunis served for five years as agent of the Chesapeake & Ohio Railway public relations department.

It was from the copy desk of the Richmond *News Leader* that Mr. Tunis resigned to take up the duties of secretary of the Public Utilities Association of Virginia and to hold at the same time the position of director of the new information bureau in Richmond.

Mr. Tunis is a native of Maryland. He was born on July 4, 1888.

C. P. BILLINGS, after nine years' service in various capacities with the West Penn System, Pittsburgh, Pa., has severed his connection with that company to go with the Electric Bond & Share Company, New York City. During his connection with the West Penn Electric Company, Mr. Billings served as vice-president and general manager of the Wheeling Traction Company, vice-president of the West Penn Company and vice-president of the West Virginia Power & Transmission Company.

GEORGE GRANT PORTER, at one time connected with the New Jersey & Hudson River Railway & Ferry Company, Edgewater, N. J., is now mechanical engineer of the DeRemer-Blantchford Company, a railway supply concern at Chicago, Ill. Several years ago Mr. Porter was active in railway work. His first experience was with the Pullman Company where he remained for seven years. Later he was employed with the West Chicago Street Railway and subsequently went abroad where he worked for the George F. Milnes Company, Ltd., car builders, and later for the London Underground Railways. On his return to this country he became associated with the New Jersey & Hudson River Railway & Ferry Company as master mechanic. This property is now part of the Bergen division of the Public Service Railway of New Jersey. Mr. Porter's experience covers steam and electric railroading, bus projects in London and in the United States and public relations activities.

Obituary

F. G. Simmons

F. G. Simmons, former superintendent of the Denver Tramway, Denver, Col., died on Jan. 20 at Milwaukee, Wis. Mr. Simmons moved from Denver to Milwaukee many years ago and became prominent in utility enterprises and political movements. He served as superintendent of way of the Milwaukee Electric Railway & Light Company and assumed other positions with that property. Early in his career he was an apprentice in the shops of the Denver & Rio Grande Railway and later took a course in civil engineering. He was connected with the Denver City Tramway for nine years in charge of track.

Most of Mr. Simmons' boyhood was spent at Niagara Falls. He was educated at St. Catherines, Ont. He was vice-president of the American Electric Railway Engineering Association for three years and was president of the association for one year. In 1912 he was a member of the committee on standards of the American Electric Railway Association.

W. R. DAUM, president of the railway property in Ottumwa, Iowa, for many years, died on Jan. 25 in his home after a long illness. He was 77 years old. It was during his term of service with the company that the lines in Ottumwa were electrified.

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Manufactures and the Markets

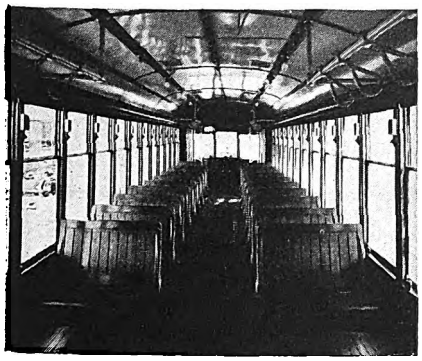
First of Twenty New Cars for New Orleans Arrive

The first of the twenty new cars for the New Orleans Public Service, Inc., were delivered on Jan. 23. Ten of the cars were built by the St. Louis Car Company, and ten by the Perley A. Thomas Car Company. Previous mention of the order was made in the JOURNAL for Aug. 20, Oct. 15, and Jan. 28. Each car has a seating capacity for 52 passengers, and a total weight of 40,000 lb.

The interior trim is in cherry. They are all-steel one-man, two-man, double-truck double-end cars and are equipped with four treadles per car—one in each corner on account of operating conditions in Canal Street in New Orleans. Ten of the units are equipped with four GE-265-G and ten with Westinghouse 510-E motors.

Complete specifications of these cars were published in the Oct. 15 issue of the JOURNAL.

These cars are merely a small part of the extensive plan of rehabilitation of the property at New Orleans entered upon since the company there passed to the group operated by the Electric Power & Light Corporation.



Interior view of one of the twenty cars for the New Orleans Public Service, Inc.

Twenty-five Articulated Units for Cleveland Railway

Twenty-five articulated units were ordered by the Cleveland Railway on Jan. 13 from the G. C. Kuhlman Car Company, Cleveland, at a contract price of approximately $450,000. One sample unit manufactured last summer and exhibited at the American Electric Railway Association convention in Cleveland last fall is included in the order.

The total cost of each unit will be approximately $29,000, according to Joseph H. Alexander, president of the Cleveland Railway. Motors, furnishings and all equipment except seats have been purchased.

Under the contract with the G. C. Kuhlman Car Company, deliveries on the articulated cars are to be made at the rate of five a week, starting 90 working days after the receipt of the order.

Purchase of the articulated cars was made under the authority of the Cleveland City Council. This is the first time that the Cleveland Railway has gone into the market to buy motor cars since 1923.

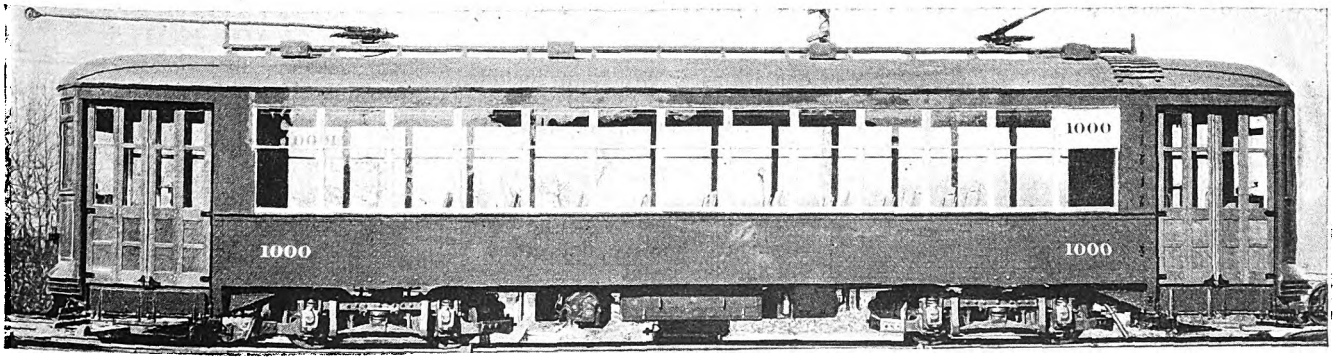
De Luxe Double-Deck Car Suggested by Peter Witt

Peter Witt, Cleveland, expects to exhibit a model of his projected double-deck street car at the American Electric Railway Association convention in Cleveland next September. He has asked twenty railways throughout the country to contribute $500 each for the construction of one of the cars, and has received favorable replies from six companies, so far. Parlor car seats and smoking privileges on the top deck are planned for the car, since Mr. Witt believes passengers will be glad to pay an extra fare for the luxury and comfort thus afforded.

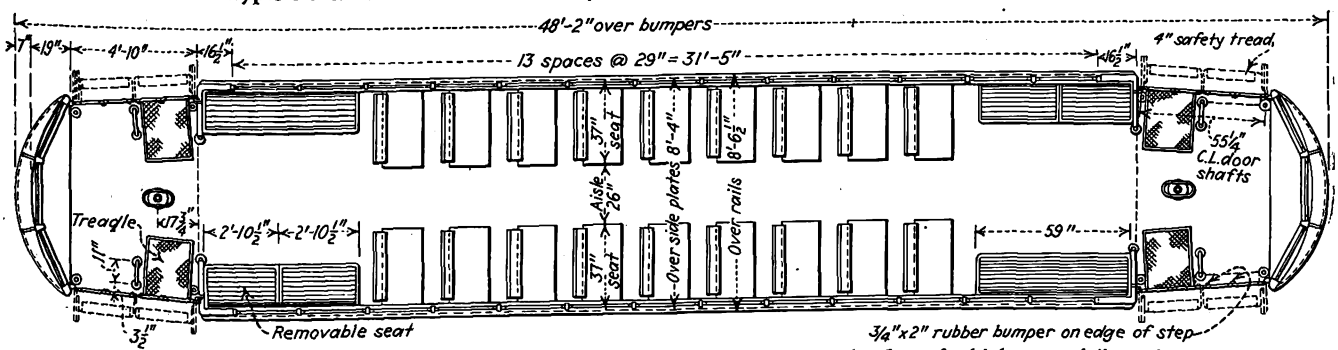
He has not approached the Cleveland Railway with a request to take part in the financing of the first car because any such expenditures would, under the service-at-cost plan in effect there, have to be approved by the City Council. He does, however, hope to have the Cleveland Railway operate the car in experimental service so as to provide data on which to judge its performance. If the model car proves to be a success, Mr. Witt expects to sell it at the convention and return the money advanced by the various railways. Some of the tentative specifications of the car were published in the JOURNAL for Feb. 26, 1927, page 370.

Motor Division Created by G. E.

Announcement of the creation of a motor division of its industrial department has been made by the General Electric Company. The new division will have general supervision of all policies, prices, etc., concerning all motors handled by this department.



Typical exterior of one of the twenty new cars for the New Orleans Public Service, Inc.



Seating plan of the twenty new units for the New Orleans Public Service, Inc., the first of which were delivered on Jan. 23. Note treadle in each of the four corners

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Metal Buying Moderate at Slight Price Concessions

The general tone of the metal market is quiet, with prices slightly easier on Feb. 8 than a week ago. The situation in copper and lead is practically unchanged since early in December; zinc has declined slightly in the two months; and tin is several cents lower, a condition that is beginning to stimulate sales.

Copper sales were very satisfactory on Feb. 1, 2, and 3, with the result that members of the producing group that has been holding for some time at 14⅛ cents delivered in the East and 14.25 cents in the Middle West were able to book several orders at those levels. A large buyer entered the market for prompt shipment, cleaning up much of the spot copper in sight at varying prices between 14.075 cents and 14.125 cents. The lower quotation mentioned has been made by one seller all week, and the market in the last two days has settled down to that level, so far as actual business is concerned, the 14⅛ cents, Valley, quotation of the large producing interests being largely nominal for the time being. The foreign market has been quiet so far this month, at unchanged quotations of 14½ cents, c.i.f.

Zinc quotations for the last two months have fluctuated within the narrow limits of 5.60@5.70 cents, with little zest in the market. Spot lots of High-Grade are nominally unchanged at 7¾ cents for Eastern deliveries.

A comparatively small quantity of lead changed hands during the week ended Feb. 8. Prevailing prices have been 6.50 cents, at which figure the American Smelting & Refining Company has maintained its contract price in New York, and 6.225 cents in St. Louis. Some metal has been available at 6.20 cents in the Middle West, but the tonnage is not large, and, on the other hand, 6.25 cents has been realized on a number of miscellaneous orders.

Tin continues its downward course, and prices are now lower than at any other time in the last three years. Since Jan. 2 Standard tin in London has declined £28 for spot and £24 for futures. Today a contango of £2 prevails, instead of a strong backwardation. Tin of 99 per cent grade is not plentiful, nor is it as scarce as it was a week ago, and the spread between the two grades is upward of ½ cent.

The afternoon of Feb. 8 buying became active and 800 to 1,000 tons was sold, the price for Straits advancing during the day from 52¾ to 53¼ cents.

METAL, COAL AND MATERIAL PRICES F. O. B. REFINERY

Metals—New York	Feb. 7, 1928
Copper, electrolytic, cents per lb.	13.85
Copper wire, cents per lb.	16.125
Lead, cents per lb.	6.50
Zinc, cents per lb.	5.988
Tin, Straits, cents per lb.	53.125
Bituminous Coal, f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	.....
Somerset mine run, Boston, net tons	.....
Pittsburgh mine run, Pittsburgh, net tons	.....
Franklin, Ill., screenings, Chicago, net tons	1.75
Central, Ill., screenings, Chicago, net tons	$1.50
Kansas screenings, Kansas City, net tons	2.125
Materials	
Rubber-covered wire, N. Y., No. 14, per 1,000 ft.	5.30
Weatherproof wire base, N.Y., cents per lb.	16.50
Cement, Chicago net prices, without bags	2.05
Linseed oil (5-bbl. lots), N. Y., cents per lb.	10.2
White lead in oil (100-lb. keg), N. Y., cents per lb.	13.25
Turpentine (bbl. lots), N. Y., per gal.	$0.645

Changes in Personnel of Yellow Truck Company

John Hertz, according to recent advices, resigned as chairman of the board of the Yellow Truck & Coach Manufacturing Company on Jan. 17 to accept the presidency of the Chicago Yellow Cab Company made vacant by the death of Charles W. Gray. He is now both president and chairman of the Cab Company. John A. Ritchie, vice-chairman of the Yellow Truck & Coach Manufacturing Company, it is reported, has been elected chairman of the board of that company.

Thomas B. Hogan has been made vice-president and manager of the Cab Company. He was assistant to Mr. Gray. Albert D. Lasker and Alfred Ettlinger have been elected to fill vacancies on the board of directors of the Cab Company.

$1,036,598 Net Profit for Brill Company

For the year 1927, the combined output of the J. G. Brill Company's four plants amounted in sales value to $11,876,669. The combined output for each of the past eight years follows:

1920	$17,537,293
1921	7,647,898
1922	10,177,582
1923	18,167,486
1924	8,721,726
1925	9,101,909
1926	10,416,381
1927	11,876,669

After deducting from earnings all cost of operations, in which are included maintenance and repairs and depreciation for the year amounting to $631,726, and after setting aside out of earnings reserve for federal and state income taxes, not yet due, of $167,048, the result of the operations of all the plants of the company shows a net profit of $1,036,598 for the year.

The consolidated profit and loss and earned surplus accounts of the J. G. Brill Company and subsidiary companies for the year 1927 follows:

Total net sales billed		$11,876,669
Cost of sales, including operating, selling, administration and general expenses and depreciation for the year, less miscellaneous income		10,673,842
Operating profit		$1,202,826
Federal income and state taxes		166,228
Net profit to earned surplus		$1,036,598
Earned surplus at Dec. 31, 1926		$5,120,015
Surplus adjustments		
		$5,120,015
Add profit as above		1,036,598
		$6,156,613
Less dividends paid—preferred	$320,600	
common	240,510	561,110
Earned surplus at Dec. 31, 1927		$5,595,503

Bids for Buses Advertised at Detroit

The Department of Street Railways of the city of Detroit is advertising for bids for furnishing buses to be used in the extension of services of the municipal system. Bids are to be opened on Feb. 23, 1928, at the department's main office at St. Jean and Shoemaker avenues.

Proposals are invited for supplying from 15 to 25 buses capable of carrying 29 to 31 passengers each, equipped either with straight mechanical equipment or gas-electric equipment.

From 25 to 50 buses are also specified of 37 to 41 passenger capacity with either straight mechanical or gas-electric equipment. All buses are to be of the street car type.

ROLLING STOCK

Northern Ohio Power & Light Company, Akron, Ohio, has recently ordered one 40-passenger A.C.F. all-steel metropolitan coach with gas-electric drive.

Oklahoma Railway, Oklahoma City, Okla., has purchased seven new 21-passenger buses for service in Oklahoma City.

SHOPS AND BUILDINGS

Chicago, North Shore & Milwaukee Railroad, Chicago, Ill., has opened a new ticket office and depot at National and First Avenues in Milwaukee. The office has been completely remodeled.

TRADE NOTES

Ohmer Fare Register Company, Dayton, Ohio, advises that it has completed final shipment of 559 No. 22 type Ohmer registers to the International Railway, Buffalo, N. Y., ordered for the accounting of revenue on city lines. The register company advises that with these machines going into service, the entire property, including the interurban and city cars, will be approximately 100 per cent Ohmer equipped.

ADVERTISING LITERATURE

Chausse Oil Burner Company, Elkhart, Ind., has issued an illustrated circular descriptive of its oil-burning tar kettles and torches.

Pyrometer Instrument Company, New York City, has issued a pamphlet "The Great Step Forward," emphasizing the advantages of its new simplified pyro optical pyrometer.

Crouse-Hinds Company, Syracuse, N. Y., is mailing Bulletin 2107, describing its pipe hangers, fixture hangers, unions and connectors.

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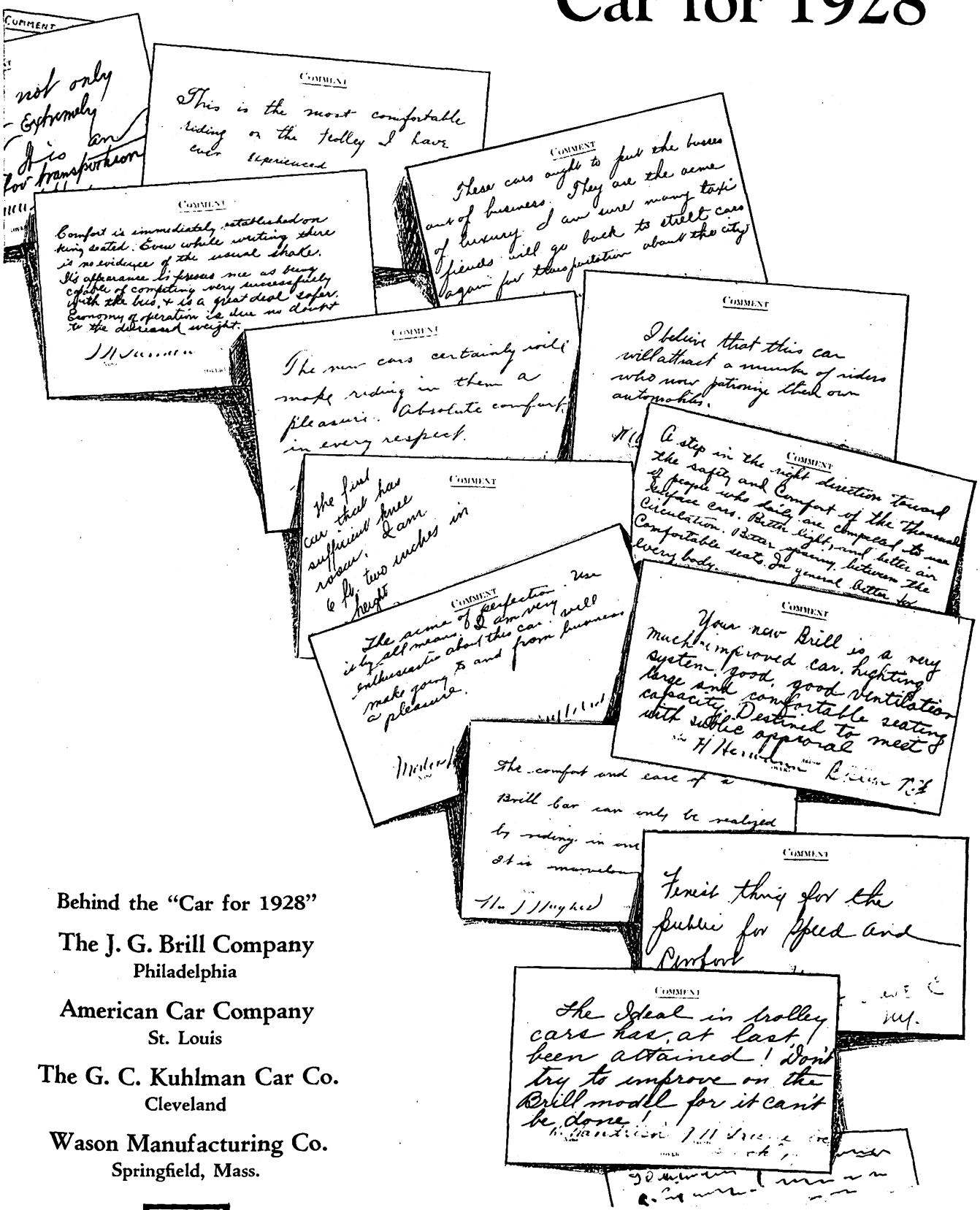
The public's endorsement of the "Car for 1928"



Behind the "Car for 1928"

The J. G. Brill Company
Philadelphia

American Car Company
St. Louis

The G. C. Kuhlman Car Co.
Cleveland

Wason Manufacturing Co.
Springfield, Mass.

BRILL

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Waukesha-Powered Walter Snow Fighter Turning Over Four-Foot Drift

a-749-LC

Snow Fighting with Gasoline

In our northern border states snow fighting is a terrifying problem to operating officials. Bus transportation must operate both summer and winter. The Colonial Coach Lines operate over 750 miles of road in New York State. During the winter their snow fighters keep 350 miles of road open, and they do it even though drifts from five to twelve feet deep are encountered.

In the illustration above a Walter Snow Fighter is shown plowing through four-foot snow drifts at twenty miles an hour. Such speed accounts for the unusual daily mileage obtained by these plows. To do this with their four-wheel drive requires a powerful, reliable engine that must run in blizzard weather for days without a stop. Waukesha "Ricardo Head" heavy-duty engines have a reputation for unrivalled reliability and economy as well as power.

A-806-LC

AUTOMOTIVE EQUIPMENT DIVISION

WAUKESHA MOTOR COMPANY

Waukesha Wisconsin

Eastern Sales Offices — *Eight W. 40th Street* — *New York City*

Exclusive Builders of Heavy Duty Automotive Type Engines for Over Twenty Years

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MAINTENANCE AND CONSTRUCTION ISSUE

ELECTRIC RAILWAY JOURNAL

McGraw-Hill Publishing Company, Inc. FEBRUARY 18, 1928 Twenty Cents per Copy

FASTER TRACK CONSTRUCTION

Is it reconstruction, or a new line? Wherever paved track is being built there's a cry for speed everywhere. The city authorities, the Transportation Department of the Railway, the car riders, the street users,—all say "speed up." Good will was never built by slow, long-drawn-out, wasteful, unnecessary methods of track construction.

There is a way—to "speed up" paved track construction:—Modern production methods, modern equipment and Steel Twin Ties.

And the surprising part of it is that modern methods and Steel Twin Ties make a better, cheaper, more lasting paved track construction!

Write today for delivered prices for your 1928 track program.

THE INTERNATIONAL STEEL TIE CO.
CLEVELAND, OHIO

STEEL TWIN TIE TRACK

The Base of Modernization

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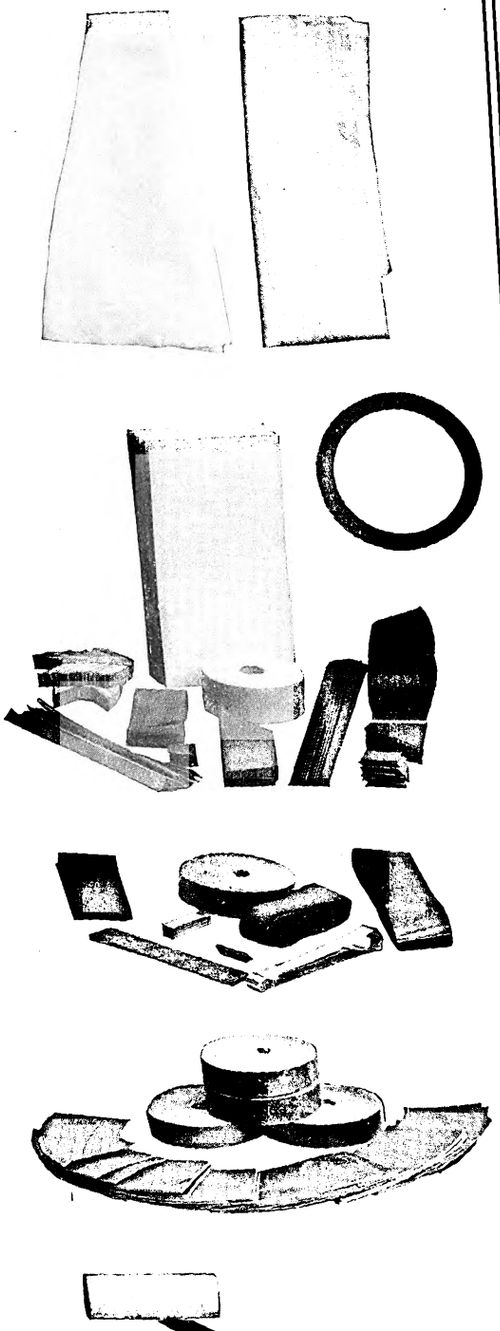
"Ready-To-Wear"



There is a suit of Armature-Insulation clothes for every Westinghouse Railway Motor.

These suits are machine cut to the original design dimensions, thereby producing a uniform product at a reasonable price.

Cutting Insulation by hand is expensive.

A chart, showing the position of each piece, can be obtained by writing to, or calling, our nearest office.

Westinghouse Electric & Manufacturing Company
East Pittsburgh Pennsylvania
Sales Offices in All Principal Cities of the United States and Foreign Countries

W WESTINGHOUSE ELECTRIC

MEMBER AMERICAN ELECTRIC RAILWAY ASSOCIATION AERA 1928

Westinghouse

X 85724

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Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review
Published by McGraw-Hill Publishing Company, Inc.
CHARLES GORDON, *Editor*

Volume 71 New York, Saturday, February 18, 1928 *Number 7*

Electric Railway Journal Wins National Award for Outstanding Service to Its Industry

THE award set up during the past year by the Associated Business Papers, Inc., to the business paper contributing the most definite and outstanding service to the field with which the publication is connected has been won by ELECTRIC RAILWAY JOURNAL. Announcement of this signal honor was made on Feb. 10 at a combined meeting of the National Conference of Business Paper Editors and the Educational Committee of the Associated Business Papers, Inc., held last Friday in Boston.

Briefs were submitted in this contest by 21 business publications serving as many different industries. The Associated Business Papers, Inc., which established the award, and under whose auspices the contest was conducted, includes in its membership 126 of the leading business papers published in the United States and Canada. The jury of award, consisting of Dr. Julius Klein, director of the Bureau of Foreign and Domestic Commerce, Department of Commerce, Washington, D. C.; James W. Brown, publisher *Editor and Publisher;* David Beecroft, vice-president Chilton Class Journal Company; William M. Richardson, chairman business paper committee American Association of Advertising Agencies, and W. A. Wolff, former president of the National Industrial Advertisers' Association, reached its decision unanimously.

IN announcing the award the committee directed attention particularly to the service rendered by the winning paper in assuming the responsibility of leadership and in campaigning courageously for practices and policies which were considered in the best interests of its industry. This campaign, the committee found, was carried out by articles, editorials and original investigations published in the paper, and by numerous speeches and talks made by members of the editorial staff. Through this activity the paper was instrumental in helping its industry to see in better perspective some of the conditions and practices which affect its welfare.

ELECTRIC RAILWAY JOURNAL is naturally gratified at being made the first recipient of this award which might be compared to the Coffin prize in the electric railway field. It is also pleased that it has been the means of drawing attention nationally, among business paper publishers, to the electric railway industry and to the heroic struggle which that industry has been making to overcome the seemingly insurmountable difficulties which all but overwhelmed it during the war and post-war periods. The story of the electric railway industry during the past decade is a story of industrial romance. It constitutes an epic of faith, courage and determination, maintained in the face of heavy and cumulative odds. The JOURNAL's part has been that of inspiring the industry to greater effort and broader vision as one difficulty after another threatened to overwhelm it. But after all, it is the industry itself which is winning the battle. It is the industry itself, and the men who constitute its executives and leaders that have encouraged the JOURNAL in its program of pointing out the road toward progress; that have counseled with the paper's editors and have contributed their best thought to its columns.

The A.B.P. Award is therefore not so much an honor for the JOURNAL as for the electric railway industry. It is for that reason that the result of the contest is particularly gratifying. In sharing this recognition with its industry it is ELECTRIC RAILWAY JOURNAL's hope that this may prove to be merely another milestone in the march of local transportation companies toward better public understanding of their problems and, in a measure, justification of the faith that inspired the industry's leaders to stick to their guns when the outlook was darkest.

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Short Cuts Are Dangerous

BUSINESS has better control of the economic, social and financial forces that are at work in its intensely complicated structure than ever before in the history of the world. There is no question but that its ethical plane has moved upward constantly and that it may be expected to move still higher. But every now and then the pressure for profit leads individuals or business enterprises to attempt short cuts and to follow the lure of expediency rather than the clearly designated road of sound business principles.

These are the things that John D. Rockefeller, Jr., undoubtedly had in mind in his remarks on the occasion of his appearance before the Senate hearing in the oil investigation. In a few words he expresses a creed to which all business men, and particularly big business, may well subscribe:

"I believe in the business of the country. I believe that business can be run only on a sound, high, fair basis. As a stockholder in any company, I want no profit derived from compromise with right. I want no officer in any company in which I own stock, whether he be high or low as an employee, to do anything that I would not myself be willing to do."

These and other things that Mr. Rockefeller said have been widely quoted. His statement did his associates and the country at large a real service. It reflects with credit his vision and his appreciation of the consequence of any course that appears to defy vested authority or public opinion, however well fortified by legal barriers the case may be.

These things are recited in terms of Mr. Rockefeller's remarks only because he is the vehicle that happens to have directed widespread national attention to this sane and healthy viewpoint. Business integrity exists only as business itself puts it there. The electric railway industry long ago learned the folly of short cuts from sound principles. Its aim today is to earn a fair profit only as it may do so through a just return for a useful service rendered to the public, with adequate wages to its employees and with insistence upon those relations between employer and employee which recognize the rights of both. The progress that has been made by many properties in establishing an entente cordiale with the public on the one hand and their employees upon whom the success of their operations depend, on the other, testifies eloquently to the sound business wisdom of building for the future upon the bedrock of faithful service and fair dealing.

Repair Work That Is Worth While

FAR too often railway repair work is done without thought of the morrow. On some roads, when a car comes in off the line for minor repairs, the one thought of the foreman is to get it patched up and out again. Naturally as little work as possible is done on it. When the time comes for general overhauling—and it comes all too soon—there may be a miscellaneous collection of patchwork jobs that have been accumulated over a period of months. To leave them in place, provided they are in working order, is the easiest procedure, so the car frequently goes out after the overhauling with a lot of nondescript elements. As this is repeated from year to year each car takes on its own individuality, and it is almost impossible to get uniformity of equipment on any line.

Contrast this with the procedure on one Middle Western property, where a new manager found a situation such as that just mentioned. He has taken as his criterion for repair work the question: Will we want this part a year from now? As a result, when an old car is being repaired, it is looked over to see if all the parts taken off should go back, or if they should be replaced by improved parts. As a result, it has been found possible to eliminate many detail parts that have become obsolete and use in their stead equipment that represents the latest development that is available. Of course, it is not possible by this means to make every old car thoroughly modern. It is, however, possible to prevent the usual kind of patchwork and to obtain a measure of standardization that makes for over-all economy.

A Traffic Institute in the Making

ORGANIZATION of the American Electric Railway Association committee on street traffic economics promises for the industry and for the country a broad study of the fundamentals of street design and use that may well be expected to have nation-wide consequences. This committee is undertaking a work which is second in importance to few subjects that confront American communities, and one which puts the electric railway industry in the position of taking leadership in the interest of sound community development.

There has been the suggestion that the country needs a traffic institute through which there may be brought together, in the interests of the nation, that small coterie of men who by training and experience have a real insight into the fundamentals of the traffic problem. Such men are in a position to work out for the guidance of the country the principles upon which economically sound solutions of present intolerable traffic conditions may be predicated.

The thought is a good one. Too many communities have jumped to conclusions in adopting traffic remedial measures, and few if any have any clearly defined policy of developing transit to meet their growing need. These problems depend for a sound solution on an understanding of many factors in city development that are fundamental and upon which there is little public knowledge or understanding. Even experts are not agreed on some of the basic principles upon which the development of a sound traffic plan depends.

In a few cities men have come into the limelight who have led the way toward distinct improvement in traffic conditions because they have had real knowledge of the problem on the one hand and public confidence on the other. In Chicago, these men were acting officials of the street railway company. But they approached the problem in the interest of the public and not the selfish interest of their own company. Only through that attitude were they able to obtain the public support necessary for application of their ideas. The results accomplished, from the standpoint of public welfare as well as that of the transportation companies, have more than demonstrated the ability of these men to guide the city's traffic policies.

That such men as these, together with a group of engineers and executives as well qualified as any men in the country to speak with authority on traffic matters, have been brought together in the committee on street traffic economics is in itself assurance that the electric

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railway industry is taking definite leadership in the solution of the baffling problems that the traffic situation presents. At the first meeting of the committee it was clearly indicated that its work is to be a distinct public contribution, and that the interests of the particular industry with which these men are identified will be secondary rather than primary in their consideration. Thus it may come about that the country will find itself provided with a traffic institute while the public at large is still thinking of how such an institution may be brought about.

Reaping the Reward of Good Work

FEW more striking evidences of the value of good will are to be found than the prompt response by the newspapers and the public of Baltimore to the record made by the United Railways & Electric Company during the recent severe snow storm in that city. The editorials were unstinted in their praise of the work of the company. Quite properly their appearance must have been most gratifying to the management. Regarded legally, this intangible, evanescent thing, good will, is premised upon the existence of competition, so it is considered not to exist as value in public service cases. It has no place in the rate base, but it is a big thing, an important thing. Judge Hough was correct technically when in passing upon the Consolidated Gas case in New York, he said that the company was required by law to furnish gas to all demanding it within certain distances of the mains. But there is another side to the picture.

Merely to run cars, merely to furnish gas, merely to sell electricity, is not enough. Long before the electric railways were confronted with the present competitive era, many of them recognized this. The companies have invariably done best which have kept up their properties and done the thousand and one other little things that make for satisfactory service. Instance upon instance could be cited, but it is only necessary to refer to the records of the roads that have won the Coffin Award and of other competitors in this contest.

Ingratitude is a very human trait, but it seldom is the reward of the man who does his very best and convinces others that he is doing all that may be expected with the talents that have been delivered into his hands. And the holder of the talent is not the judge and jury in passing upon his own acts. The court by which his acts are judged is the court of public opinion. It is not a perfect court, to be sure, but its verdict is usually just. No business, not even a non-competitive business, is a law unto itself. Legally, the matter of good will may not be taken into account in non-competitive business, but good will is nevertheless the factor that very often spells success or failure for a property.

Real Maintenance Anticipates Repairs

PAINSTAKING thoroughness is the price that must be paid if success is to be attained in any continuing enterprise. Nowhere is this more true than in the work of keeping a property in condition for providing the class of service that is demanded by the public today. It is not enough to make repairs after a failure has occurred in service. The incipient failure must be discovered and the cause removed if the public is to be impressed with reliability and excellence in the company and its organization.

In this connection, attention has been directed in the past few years to the outstanding record made by the maintenance forces in New Orleans, where failures of service are so rare that they are a matter of comment. The way this has been accomplished was told at the recent meeting of the Electric Railway Association of Equipment Men, Southern Properties, by Gus C. Kraus. His paper, which is abstracted in this issue, carries no hint of a magical method. Rather, the excellence of the performance is the story of consistent, intelligent, hard work.

The practices followed in New Orleans, while they are of the best, are known to every master mechanic the country over. The secret, if there be any, lies in the inspection and overhauling of the equipment before it is due to fail from ordinary wear and tear. This requires a definite program which is developed after long experience and is definitely held to. No easier road to good service exists.

The Changing Status of the Employee

APPROXIMATELY 2,000 men and women, veteran workers of the Westinghouse Electric & Manufacturing Company, attended the fifteenth annual banquet of the company's veteran employees' association a few days ago. This occasion was not only the largest affair ever held by the organization, but the largest banquet ever held in Pittsburgh. More than that, it served to focus attention on the changing status of the employee where proper direction is given to his activities with the recognition of the responsibility of the employer under the economic conditions that exist today.

The procedure followed by the Westinghouse Company in its dealings with employees is only one of many that might be cited. Other electrical manufacturers, notably the General Electric Company, have followed a similar progressive procedure. In the public utility field, participation by company managements on behalf of their employees extends in addition to pensions, to insurance, profit-sharing, building and loan activities, industrial loans, preventive medicine, doctoring, nursing, supervisory efforts and the planning and management of budgets.

While the theory still persists in some quarters that employers have no economic responsibility to old workers, it is much less pronounced than it was, even in business regarded as highly competitive. The idea of progressive managements now is to use men intelligently, particularly older men, by training them for work which they can do when they no longer are able to perform the exacting tasks which were theirs during their younger years. In this work especially have the utilities been in the forefront.

The case for the future was put succinctly by Secretary of Labor Davis at the Westinghouse Company banquet when he said that science has added years to the span of human life. Instead of becoming a liability at 50 or 60, the intelligent worker is all the more an asset to the concern that employs him. The veteran employee is always worthy of his hire—some hire. If that were not true, he never would have become a veteran in that particular service. Much still remains to be done in the realm of bettering employee relations, but in the progress so far made the great electrical manufacturing companies and the rank and file of the public utilities have played their part and played it well.

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James H. McGraw Wins Bok Award

Publisher of Electric Railway Journal Gets 1927 Medal for Distinguished Personal Service Rendered American Commerce and Industry Through Raising the Standards of Advertising

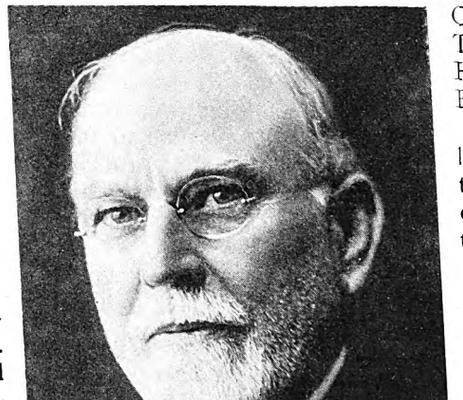
JAMES H. McGRAW, president of the McGraw-Hill Publishing Company, Inc., chairman of the McGraw-Shaw Company and chairman of the McGraw-Hill Book Company, was presented the Harvard Advertising Award for Distinguished Services to Advertising (in 1927), highest of ten awards established by Edward Bok, at a dinner held on Friday night, Feb. 17, under auspices of the Graduate School of Business Administration of Harvard University. The award takes the form of a gold medal given to the "individual or organization deemed by the jury of award to merit recognition for contemporary services to advertising." The medal bears the inscription: "To James H. McGraw — For distinguished personal service rendered American commerce and industry through raising the standards of advertising—1927."

The Bok Awards are administered by the Graduate School of Business Administration of Harvard University. They are offered in the conviction that advertising, wisely utilized, is a great economic power to broaden markets and decrease the cost of distributing goods; but, if unscientifically employed, is wasteful to the community. The prizes are given for the best work in advertising within the terms of the several awards in accordance with the decisions of a jury of award appointed by the dean of the Harvard Business School.

The following quotations from the Harvard University announcement of the award indicate the reasons for bestowal of the medal upon Mr. McGraw.

1. James H. McGraw, president of the McGraw-Hill Publishing Company, Inc., was awarded the Gold Medal for Distinguished Contemporary Service to Advertising because of his life-long service in the upbuilding of higher standards in advertising in the business press of the country.

2. In making the award of the gold medal, which is the greatest honor in the series of Harvard Advertising Awards, Professor Sprague spoke of Mr. McGraw's pioneering work in the recognition of advertising's relation to marketing, and of his constructive services in the upbuilding of the highest advertising practices among the organized business press.



James H. McGraw

Professor O. M. W. Sprague is acting dean of the Graduate School of Business Administration of Harvard University. He presented the awards in the absence in Europe of Dean Wallace B. Donham.

In the field of business publishing, Mr. McGraw has been a leader in securing adoption of the code of ethics and business practice which today governs the editorial, advertising, and business activities of the organized business press. He has been a pioneer in the recognition of the relation of advertising to marketing. Studies of industry's buying habits and the effective form of marketing organization for industrial products have done much to clarify industry's appreciation of the particular requirements of industrial marketing, as contrasted with the development of sales to the private consumer. Mr. McGraw's constructive service to the upbuilding of American industry has long been recognized and was formally acknowledged publicly at a dinner of industrial leaders, held in New York a year ago. The committee which arranged for that dinner included Secretary Herbert Hoover; Thomas A. Edison; Owen D. Young; the late Guy E. Tripp; Simon Guggenheim; John Hays Hammond; General William Barclay Parsons and Gerard Swope.

Mr. McGraw is president of the largest business publishing organization in the world, issuing fourteen engineering and industrial publications, twelve in New York, one in San Francisco, and one in London. The weekly and monthly journals over which he exercises executive control penetrate to every civilized country. They cover the fields of civil engineering and heavy engineering construction; the electrical, radio, electric railway and bus industries; the machine-using industries; the generation and application of power; the chemical industries, coal mining, and nonferrous metal mining. McGraw-Shaw publications serve industrial management and plant engineering through the broad sweep of industry as a whole.

In the electric railway and the electrical industries, Mr. McGraw has pioneered in development from the early days. His publications have been responsible for the adoption of co-operative movements in many industries. They have insisted upon the elimination of unethical practices, wasteful of the public good.

Mr. McGraw was born in Panama, Chautauqua County, New York, on Dec. 17, 1860. He came into publishing from the principalship of an upstate school. He is a member of many engineering, business and scientific organizations. Among these are the American Institute of Electrical Engineers, the American Society of Mechanical Engineers, National Electric Light Association, American Electric Railway Association, the Illuminating Engineering Society, Harvard Business Historical Society. He is the third person to be honored with the medal for distinguished services to advertising. The two men previously honored are Ernest Elmo Calkins, president of Calkins & Holden, and O. C. Harn, managing director of the Audit Bureau of Circulation.

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Advertising

And the Maintenance of Prosperity

By James H. McGraw
President The McGraw-Hill Publishing Company, Inc.

"The Part Which Advertising Plays in American Business Progress" was the subject of an address prepared by Mr. McGraw for delivery at a dinner held at the Faculty Club in Boston on Feb. 17, upon the occasion of the presentation to him of the 1927 Bok Award for distinguished service to advertising. His remarks dramatize the power and limitations of this modern business tool and voice the high ideals that must guide those who direct and use it

ADVERTISING has come to occupy an important position in the consciousness of the public and of business. Its potentiality—for good or for ill—in the distribution of both industrial and consumer goods, is recognized as tremendous. An abiding sense of responsibility to the public must be employed in directing this force. Assurance that advertising men recognize this responsibility is afforded by such organizations as The International Advertising Association and the Better Business Bureau. But a still more dramatic assurance has been called for, and this Mr. Bok has created in the Harvard Advertising Awards.

When, four years ago, these awards were announced, it was particularly gratifying to me that Mr. Bok, an outstanding editor and exponent of highest publishing standards, should have so clearly sensed the social responsibility involved in the creation, use and sale of advertising. At each stage of the business situation, advertising takes on new significance and new obligations. More and more, advertising becomes essential to the economical movement of goods, from industry to industry, from producer or merchant to consumer. More and more does advertising guide preference for commodities and services that, interwoven, form the very warp and woof of our civilization.

Advertising as a Business Force

At present the volume of trade is large. But competition is throttling; and profits, in some quarters, are declining. Some industries are despairing of customers. Has advertising, now so generally used, proved ineffective in maintaining full prosperity? Or have we as yet failed fully to appropriate the power of this great force? Lowered profits and idle capacity are not the concern of the stockholder alone. The public as a whole—employing and employed, as well as investor—suffers a set-back when profits are squeezed and wares go a-begging.

Primarily the function of advertising as a business force is to interpret or expand a personality, whether of a product or of a service or of an industry. Products and services vary greatly in personality or distinctiveness, and it has long been recognized that a distinctive product has a decided advantage and security in the market. Excessive competition, with the squeezing out of normal profits, results from a surplus of identical or alternate products, or a surplus of products believed to be alternate.

In considering the broader use of advertising as well as its more effective application, it may be questioned whether any product, however staple it may appear at first sight, is without elements of distinction. A product is endowed with the qualities of its makers, and no organization is entirely devoid of personality. The very fact of survival in a competitive market is proof that there is distinctiveness in product or service. There are such individual factors as company reliability; assurance of progressive product improvement through intelligent engineering or painstaking research; ability to assist buyers by prompt deliveries; competence of representatives to advise on use and application of the product and on the condition of the market. There are a hundred respects in which firms differ from each other. All these affect the willingness of the buyer to take one manufacturer's product rather than another's, even though the products appear to be similar.

Advertising Puts the Battle on the Seller's Ground

The very planning of advertising results in a most searching examination of products since the distinctive elements must be determined. If, perchance, there be no market distinction, then, at the very least, advertising may guarantee a continuance of quality. The market position of certain brands of flour, bread, soap, cement, brass, industrial belting—the prosperity attending their makers—is eloquent testimony of advertising's effectiveness in the staple field.

True, advertising does not confer full immunity from price considerations and consequent narrow profits and halting markets, but it does shift the competition to bases of quality and use. It puts the battle on the seller's rather than the buyer's ground, but at the same time it proves a boon to the buyer because of insistence on quality. "Quality is remembered long after price is forgotten" is a slogan already accepted as a principle by industrial consumers. It suggests distinct social advantages to consumers at large.

Advertising cannot create qualities. Advertising cannot give market standing to a product where market value does not exist. It is sheer folly to assume that a product will take on compelling qualities if only they be claimed in advertising. Advertising can express, develop and amplify what is already present. It can stimulate the seed of product or service personality to growth and vigor. It cannot create the seed.

How often, through widespread advertising, do we learn that some worthy product, unknown because unheralded, is now to step out and claim its rightful place in the market. Advertising, presumably, is to supply the vitality, lacking for long slumbering years; advertising,

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presumably, is to create overnight the effective producing organization that the years should have been developing; advertising, presumably, is to create marketing courage where timidity has calmly reigned. Invariably the effort fails. The newcomer, flashing meteor-like across the sky, fades quickly and leaves but black night. And often, all unjustly, the finger of accusation is pointed at advertising's failure.

Advertising is a challenge to soundness. It drags an institution into the limelight. It exposes it to examination and to criticism of its claims. Its defects are sure to be exposed. For businesses with productions that match the needs of the times, advertising is a beneficent instrument; for those with products that have no rightful claim to a market with the public, advertising is either corrective or it is fatal.

ADVERTISING cannot create qualities. Advertising cannot give market standing to a product where market value does not exist. It is sheer folly to assume that a product will take on compelling qualities if only they be claimed in advertising. Advertising can express, develop and amplify what is already present. It can stimulate the seed of product or service personality to growth and vigor. It cannot create the seed.

If advertising is to be an effective instrument of prosperity, soundness of marketing methods must be added to soundness of product or service. Distribution costs are being subpoenaed to appear before the court of public opinion. Too often advertising has had to bear the unjust odium of marketing's shortcomings. The logical markets may have been wrongly appraised. Distribution was attempted under conditions that made the cost prohibitive. Difference in buying habits, according to fields or industries, has been overlooked. Appeals to buyers have not been valid. Distribution channels have not been effectively organized. The sales force has been inadequate, ineffective or mishandled.

It is to their credit that many advertising men have been among the leaders in the adoption of modern marketing methods and that, in large number, they are competent counselors on marketing plans. We have a grave responsibility towards those to whom we offer advertising counsel. Effective advertising must be reared on two sturdy foundations; the first, a product or service which meets existent or unexpressed needs of the market; the second, a waste-free marketing plan for reaching responsible buyers.

A PRODUCT is endowed with the qualities of its makers, and no organization is entirely devoid of personality. The very fact of survival in a competitive market is proof that there is distinctiveness in product or service. There are such individual factors as company reliability; assurance of progressive product improvement through intelligent engineering or painstaking research; ability to assist buyers by prompt deliveries; competence of representatives to advise on use and application of the product and on the condition of the market.

In adapting advertising to its destined sphere of usefulness, we of the business press have endeavored to do our share. The consumer medium creates consumer demand and directs the consumer to the dealer. Our function is to move goods from industry to industry, and from maker to distributor. To no small degree, industry's profits are measured by economies in those many inter-industry and inter-merchant movements which lie back of the final sale.

The very essence of the business press is an intimate relationship with and understanding of the industry or trade served. The significance of its editorial counsel finds reflection in the use of its advertising pages. Over inter-industry transactions, the industrial paper throws an effective net, tapping in for every industry on its supply channels, and affording the supplier a direct contact with his market. The buyer uses the industrial paper as a tool of operation, making it the channel through which he selects the materials and equipment for the efficient manufacture of his product.

It is evident, therefore, that the industrial division of the business press has an important beneficial effect on the profit margin. Its reading pages are a text book of economy in manufacture; its advertising pages, a textbook of equipment for doing jobs at lower cost. Through the reading and the advertising pages, then, it conduces to the lowering of producers' costs on consumers' products. Thus it tends to widen the profit margin. At the same time, through stimulating economies in production, it gives the public continually greater values.

In its trade division, the business press is friend and counselor of distributor and dealer. It is a powerful instrument in developing producer-distribution relationships that smooth the flow of goods to the public. It transmits evidences of sustained demand, introduces new products quickly, demonstrates the power of quality. Through the trade paper is established a community of interest among manufacturer, distributor and dealer. They become co-operating elements by which consumer wants are filled with desired merchandise of known quality, with prices reflecting speedy turnover.

The award of this medal, this high honor, to a business paper publisher indicates to me that the advertising world is aware of the importance of the business paper in serving industry, trade and the public.

Advertising, proved an effective instrument in marketing specialties, is now entering the even larger arena where staples are battling before a price-obsessed public. It offers new weapons of quality and service in the struggle of business with meager profits. In this, advertising works for the public as well as for the advertiser. It helps to stabilize industry, and thus employment and dividends. It emphasizes quality and use, which, with price, are sounder criteria of value than price alone. It assures, through price stabilization, the continued improvement of and the development of products.

For myself and my colleagues in business paper advertising, I pledge you our best endeavors in a continuance of study, research and experiment, to correct misapplication of advertising, to make it a still more effective tool of business, and an agent in advancing the public welfare.

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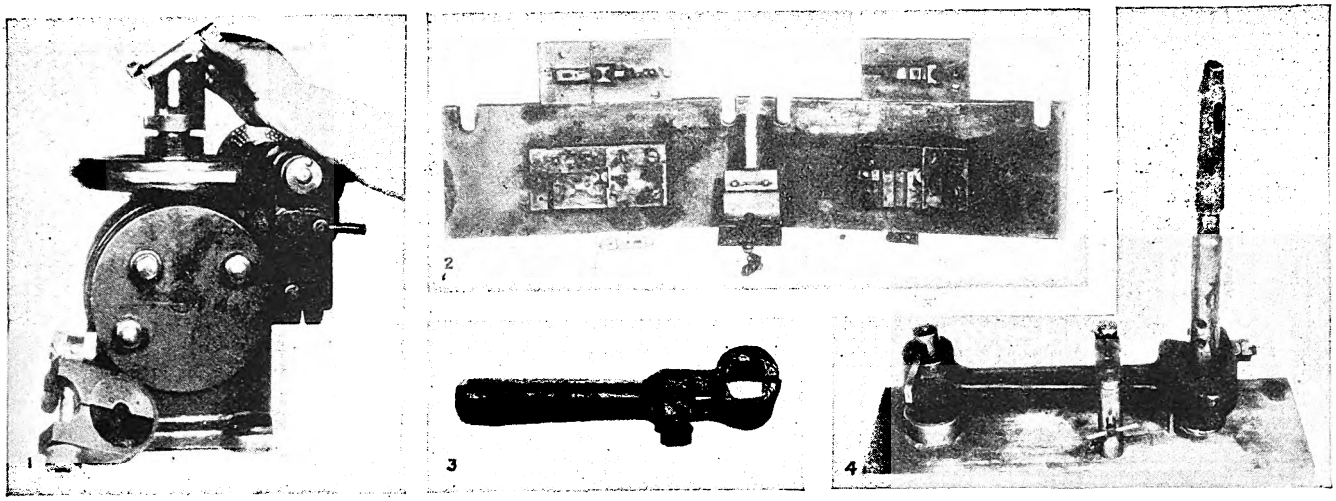


1. A special clamp combined with an ordinary indexing head is used in the milling of engineer's valve stems.
2. The punch and die at the left produces the larger half of display card clips. The punch and die in the center is used to bend the piece to its final right angle shape. The punch and die for producing the other half of the clip is shown at the right.
3. Hinged type engineer's valve handle.
4. Jig used for boring rebabbitted air compressor connecting rods.

Jigs and Dies Have Many Uses

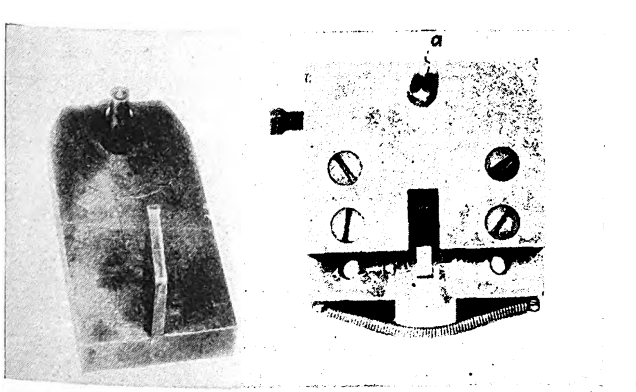
in Shops of Chicago Surface Lines

Small parts of various kinds are either partly or entirely made by punching processes in Chicago. Some of the work is automatic or semi-automatic and requires no finishing

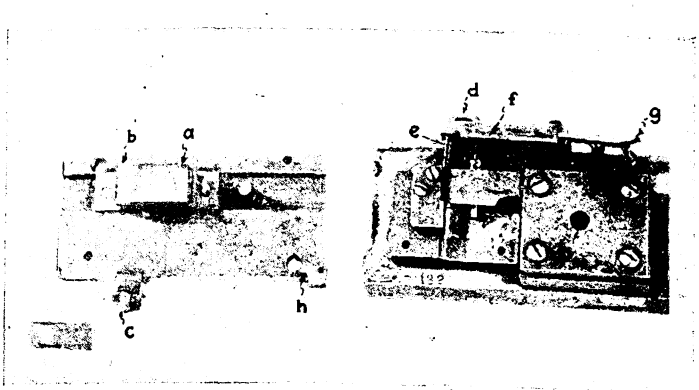
PRODUCTION of maintenance parts and special parts for various purposes about the Chicago Surface Lines is facilitated through the use of various jigs and dies. These insure uniformity and also accurate workmanship and hence save much time and trouble which would be necessary without them. A large number of these fixtures were described in an article in ELECTRIC RAILWAY JOURNAL for Dec. 20, 1924, page 1023. Some additional ones are given in the brief submitted for the 1927 Coffin Award. These are described below.

A form of die used for punching holes in small structural members which have been laid out with a center punch is arranged to locate the holes from the punch marks. When set up in the machine the end of the pointer marked *a* in the accompanying illustration corresponds exactly with the center line of the punch. When the work is moved so that the end of the pointer coincides with the center punch mark the hole to be made is located and the punch itself will descend in proper position. A wedge carried on an extension back of the punch enters the slot as the punch descends and forces the slide back so as to move the pointer out of the way while the hole is being made.

The distinctive feature of a semi-automatic punch and die used for forming contact fingers is its automatic ejector. Material of the proper size is fed continuously into the machine and the press is operated at top speed. As the punch descends the finger marked *c* in the accompanying illustration enters the opening *d* and forces the U-shaped ejector out of the way of the forming punch *b*.



Die which locates holes from center punch marks. The pointer is designated as "a" in the accompanying illustration



Semi-automatic punch and die for forming controller fingers. A feature is the automatic ejector

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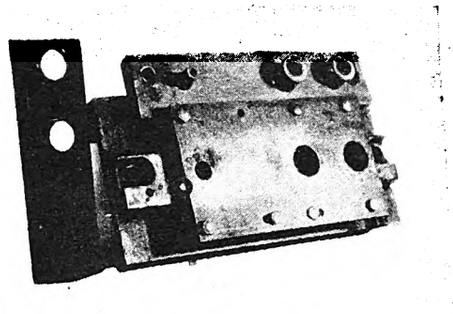
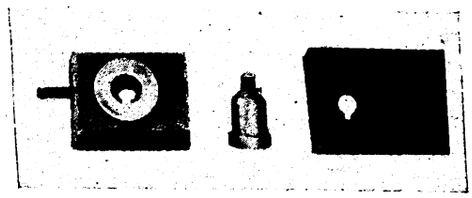
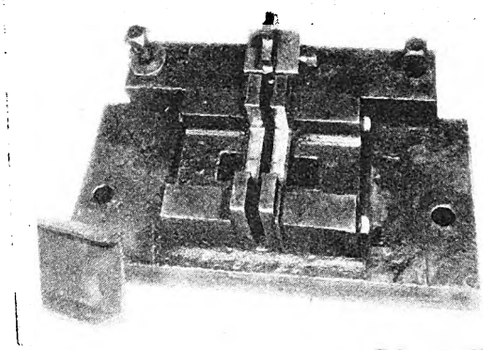


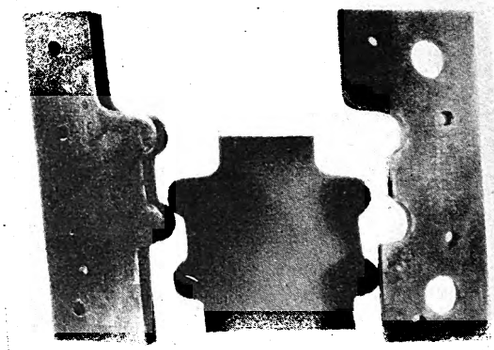
Multiple punch and die for punching large holes in channels



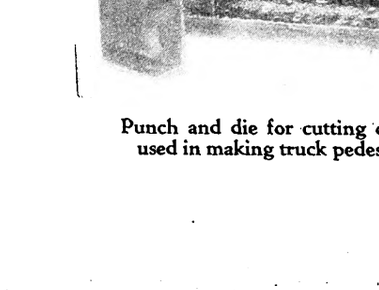
Punch die for making countersunk slotted holes in structural channel wear plates



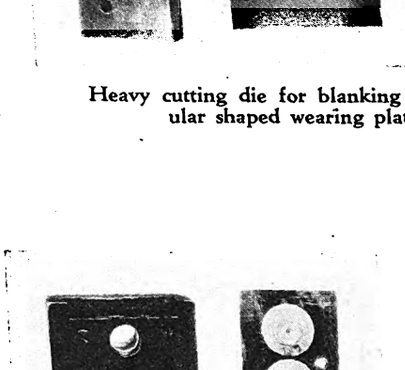
Punch and die for cutting off channel iron used in making truck pedestal wear plates



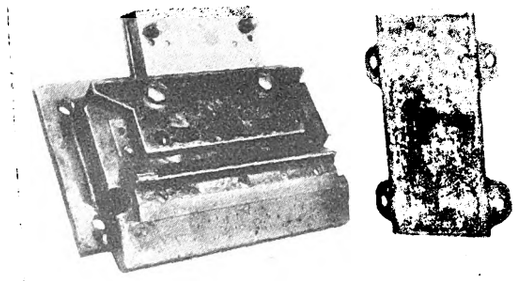
Heavy cutting die for blanking out irregular shaped wearing plates



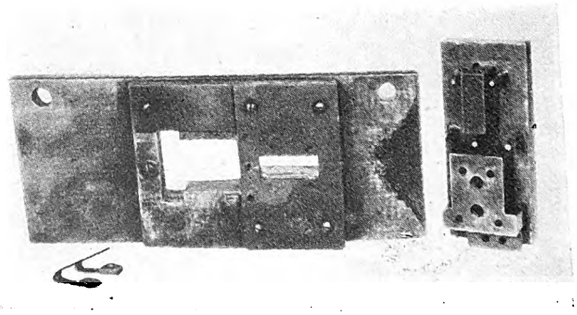
Fixture used for broaching brush-holders



Double die for punching trolley wheel washers



Jig for punching holes in wear plates



This punch and die is used in the production of contact springs as shown in the lower left-hand corner

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The ejecting spring *e* is compressed and the latch *f* drops into a notch, thus holding the ejector back in position. While this action is taking place the hook *h* slips below the secondary latch *g*. The piece in the meantime has been punched, formed and cut off and is lying in the bottom of the die. As the punch ascends the hook *h* trips in turn the secondary latch *g* and the latch *f*, releasing the ejector *d*, which under the action of the spring *e* snaps the completed piece out of the bottom of the die.

An excellent example of a die which substitutes punching for what would ordinarily be a drill press job is the one employed to make large holes in the channels that are used as wear plates on truck pedestals. In the illustration showing this multiple punch and die the block in the die supports the web of the channel so that it can be punched without distorting the flanges.

Another simple punch and die are used to make countersunk slotted holes in 4-in. structural channel wear plates for truck pedestals. These particular wear plates are held in place with countersunk head bolts with a lug at one side to prevent them from turning. As will be seen from the illustration the punch not only cuts and countersinks the hole but also forms the notch to take the projecting lug on the bolt.

Another illustration shows a heavy cutting die for blanking out the irregular-shaped box wearing plates. It is necessary to make two cuts to complete the work, the piece being turned around after the cut on one side has been made. For cutting off the channel iron used in making truck pedestal wear plates a special punch and die are used. The die acts as a support for the web and the flange of the channel, thereby preventing distortion of the member which is cut. For punching the holes in the ears after the pieces are formed a special jig is used. This is of interest chiefly because of the complicated shape of the piece to be punched. It will be seen from the illustration that several sets of holes in the jig permit it to be used for punching wear plates for different sizes of journal boxes.

A simple jig for holding brush-holders while the brush slide is being broached is shown in another illustration. The movable block, actuated by the hand screw, holds the brush-holder against the block. This block is pinned at one end, so that it can be raised out of the way, permitting insertion and removal of the brush-holder. The broach is shown in a position ready to be pushed through by a press.

Trolley wheel washers are made efficiently by a double die. The material from which the washers are punched is purchased in rolls, two thicknesses of which are fed to the die at one time. The ribbon is fed through at such a rate that four washers are formed at each stroke of the punch. In the illustration the punches for the holes are shown at the top and those for blanking out the washers are at the bottom.

Another interesting punch and die shown are used to form a special type of contact spring. Five small punches produce the holes which support the spring and fasten on the contact tips. A large punch cuts the material out to the desired shape. Punching and forming are done at one stroke of the press, so that a complete spring is blanked out each time, the spring being given its final form by another punch and die in a following operation.

Display card clips are made in a special die. One part, shown at the left of the illustration, produces the large half of the clip, a complete unit being punched, shaped and cut off at each stroke of the punch. Another punch and die, shown at the center, bend the piece to its final right-angle shape. The punch and die used to produce the other half of the clip are shown at the right. In both cases the material, furnished in the form of a ribbon, is fed to the die by hand, a stop allowing the proper amount to enter at each stroke of the press.

A simple jig facilitates the boring of rebabbitted air compressor connecting rods. The holding down strip is pinned at one end so that it can be swung out of the way, allowing the connecting rod to be placed in its proper position. The wristpin end of the connecting rod fits snugly over the plug and is held in place by a taper key. The wristpin end is supported by a plate and the crankpin end by pins. Side adjusting screws enable the operator to center the bore of the crankpin end with respect to the boring bar pilot hole in the base of the jig.

For milling engineer's valve stems a clamp combined with an ordinary indexing head is used. The clamping device consists of a split bushing which is tightened by a lever actuating a cam. Engineer's valve handles used on the system have special provision to compensate for wear of the stem and handle. The two main parts of the handle are hinged together at the stem end. The inner end of the smaller part is connected to the larger part by means of a screw and knurled adjusting nut. Tightening of this nut eliminates the backlash and the handle cannot be accidentally pulled off from the stem. As there is no movement between the handle and the stem in service there is no wear, and a saving in the bushing of handles results.

Berlin, N. H., Does Extensive Track Rehabilitation

5-in., 80-lb. T-rail laid on creosoted ties used with paving of concrete. Cost was paid from earnings

By Harry W. Noyes
Manager Berlin Street Railway, Berlin, N. H.

During the months of July and August, 1927, the Berlin Street Railway reconstructed 3,000 ft. of paved track in the city of Berlin, N. H. Although in these days of the automobile some railways are taking up their tracks and substituting buses, this company is taking up old rails and installing heavier rails, double bonded, with treated ties completely imbedded in concrete. Every dollar spent on this new construction was taken from money earned in the past seven years. It is interesting to note that this street railway has been able to pay dividends on all of its stock for the past six years.

In 1923, 1924 and 1925 this railway laid 1,750 ft. of new track with concrete paving and the past year's work has been a continuation of the same program. Most of the track to be replaced was installed in 1902, with 4-in., 60-lb. rail. The base and filler in some places were of sawdust and slabs, covered with about 4 ft. of stones and gravel. In the course of time this paved section gradually sank and became extremely costly to maintain.

Excavation work was done by two compressors operating four paving breakers. The crew consisted of two foremen and 40 men. Solid concrete had to be taken out in some places to a depth of 11 in., or 3 in. below the bottom of the city's 8-in. paving slab.

Special care was used to make the paving waterproof, particularly along the rail. After the excavation of every 200 ft. the trackmen laid and resurfaced the new track.

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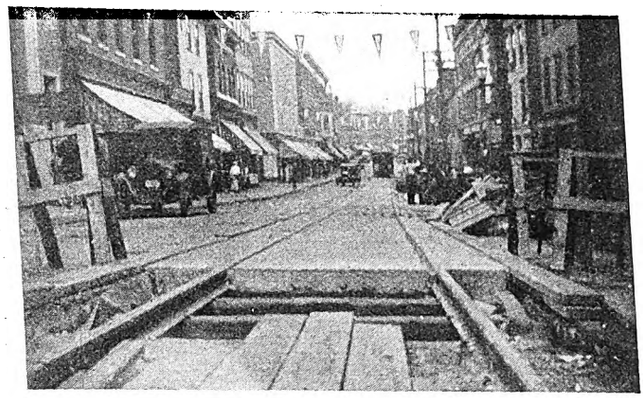


Track at Berlin, N. H., rebuilt with 5-in., 80-lb. T-rail and concrete paving

Standard A.S.C.E. 80-lb., 5-in. Carnegie open hearth T-rail, in 33-ft. lengths, with six-hole angle bars, was used. Spacing of drill holes was 2½ in., 5 in. and 6 in. Track bolts ⅞x4⅜ in. were used with U. S. Standard square nuts and ⅞x$\frac{5}{16}$x¼-in. heavy positive type D lock washers.

Rails are supported on creosoted Southern yellow pine and kyanized Northern spruce ties. In a railway the most important ties are under the joints, switches and frogs. At these points we used at these places only kyanized Northern spruce ties, manufactured by the Brown Company of Berlin, N. H. At other places we used the creosoted ties. These ties were laid with 30-in. centers, while the joint ties were spaced with 24-in. centers. The ties were laid on 2 to 4 in. of sand and gravel.

The rails were double bonded at each joint, using O-B rail bonds, type AW-8, 7 in. long and of No. 00 size. These were welded on the ball of the rail. On the base of the rail, at each joint, we also used the O-B rail bond, type AW-7, 44 in. long. At about every 500 ft. we used cross bonds, made of old trolley wire.

Carey expansion joints were used, with dimensions of ¼x9x7 in. After pouring a 1:2:4 mixture of concrete, it was allowed to cure for seven days. Great care was taken to tamp the wet mixture of cement, sand and stone thoroughly under the rails. The city then laid kyrock, a bituminous form of oily concrete from the edge of the cement to the curb of the sidewalk. When thoroughly compressed and properly laid this becomes hard and makes a good street surface.

At two places in this reconstruction bridges were encountered. Water formerly ran under these bridges and afterward they were filled in with various materials. Considerable sinking had occurred. At these locations a layer of concrete 8 in. deep was laid. On this old rails were placed covering an area of 8 ft. wide and 40 ft. long. Then the rails were covered with concrete. The ties were placed on this surface and covered with the regular paving, 11 in. between and 5 in. over the ties.

Special work had to be installed on one turnout. This consisted of two switch mates and two frogs. The two rigid mates were of manganese steel, iron bound, of 7-in. construction and having a tread clearance of 3 in. The two frogs were of hard center and were iron bound.

Since the completion of this reconstruction the Berlin Street Railway has received many compliments from its patrons.

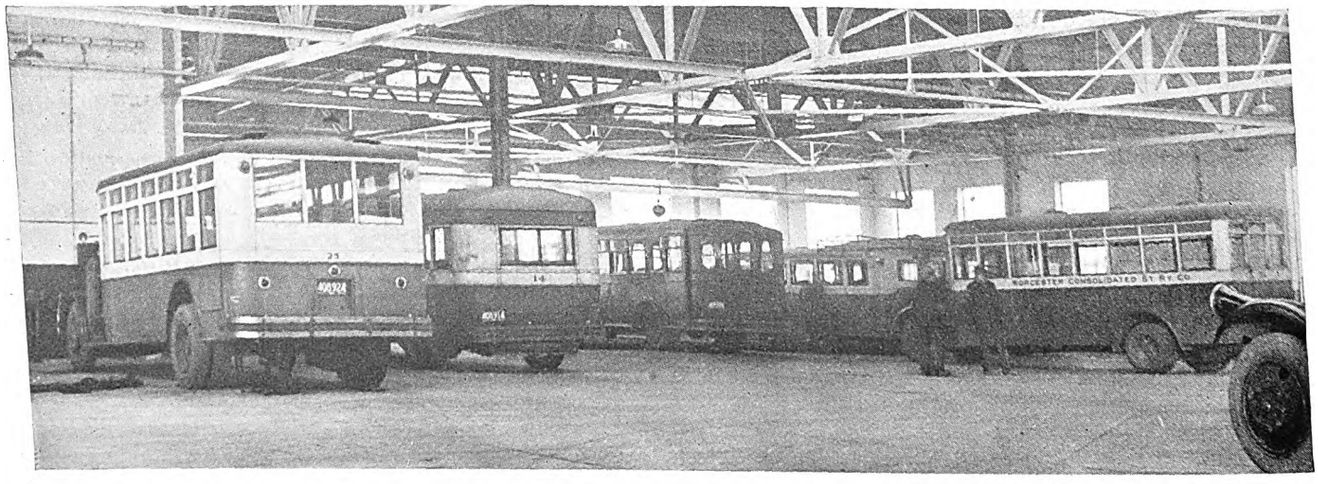
Increase in Assets of Milwaukee Loan Association

MORTGAGE loans amounting to $1,991,691 were made during 1927 by the Employees' Mutual Saving, Building and Loan Association, comprised of employees of the Milwaukee Electric Railway & Light Company, Milwaukee, Wis., according to the association's annual report. Assets on Dec. 31 are shown to be $9,154,556, an increase of 14 per cent. Outstanding loans number 3,077, an increase of 279 for the year.

New Bus Garage for Worcester

FIFTY buses can be accommodated in a garage recently completed by the Worcester Consolidated Street Railway, Worcester, Mass. The cost was about $120,000. The large floor space is free from obstruction and the roof is of the truss type. A large skylight provides daylight illumination. The garage is equipped with a large machine shop, repair pits and a battery-charging department.

A new carhouse has also been built at a cost of $235,000. It is of modern design, being modeled after the Hooker St. carhouse in Springfield, Mass. There is space for 40 cars inside the house, and an outside storage yard provides for 200 additional cars. The carhouse has facilities for inspection and washing. It also provides rest rooms for employees, lockers, offices and a restaurant. The garage and the carhouse are adjacent, both standing on the Grove St. property of the company, which previously was used largely for outdoor storage.



Interior of new bus garage

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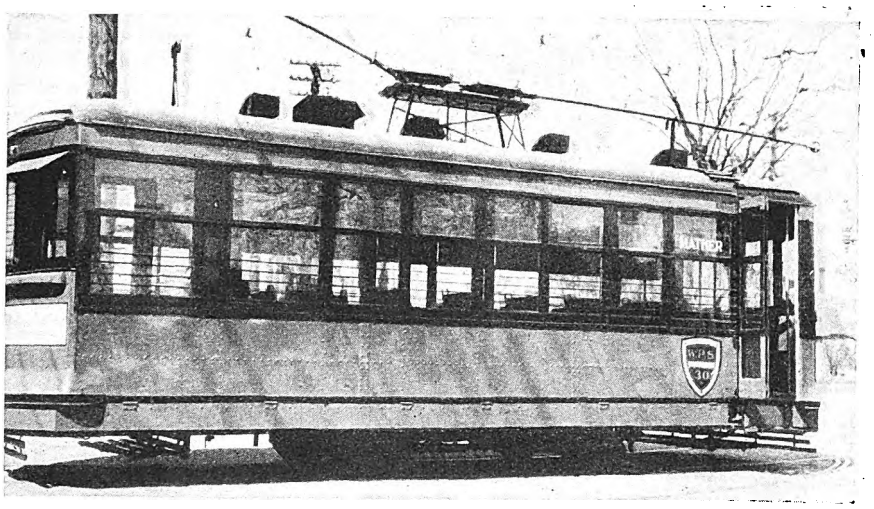
Making Old Cars Attractive

It is possible to do many things to improve the appearance of rolling stock so that it has greater rider appeal and earning power. Rubber insulation has reduced noise greatly

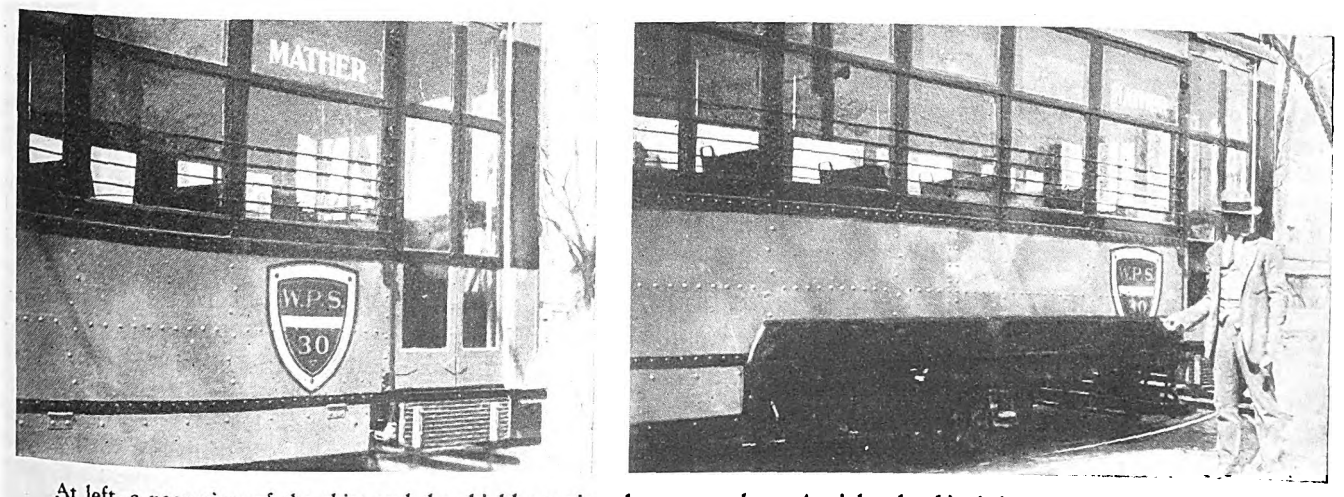
By Joseph E. Bodoh
Master Mechanic Wisconsin Public Service Corporation, Green Bay, Wis.



A gutter above the windows prevents rain from streaking the windows. Note the skirt which conceals the running gear and reduces noise

NOT only can new cars be designed so as to attract the eye of the riding public but to a considerable extent the existing rolling stock can be improved so that it also has an appeal. Along this line the Wisconsin Public Service Corporation at Green Bay made the Civic Safety Week held there recently the occasion of special significance with the first showing of a new idea in street car development. One of the regular Birney city cars was turned over to the master mechanic some time ago with permission to do just about anything that he cared to with it to improve its riding qualities, its appearance and safety features, at a minimum of expense, of course. The result, as first offered to the public during Safety Week, has received unstinted praise.

A careful study of the demands of the public and of the necessities of the present street car era brought forward three outstanding needs in new car development. It was felt that the people wanted a better-looking vehicle than they had in the past been accustomed to riding in, as their private conveyances were finished both inside and out with the best available materials and in attractive colors. Another factor, noise, has brought street cars into public disrepute during the past few years. The clatter and rumble of the older cars has lost both cus-



At left, a near view of the skirt and the shield carrying the car number. At right, the skirt is in sections which can be raised for ready inspection beneath. Rubber blocks reduce noise of the running gear

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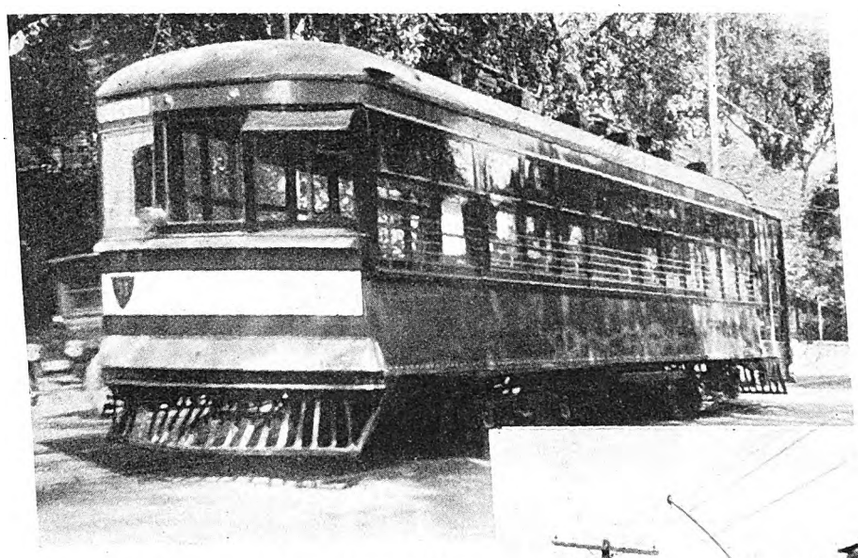
tomers for the railway and friends among those who do not habitually ride. A third factor, safety, is of special interest at the present time because of the national study of traffic problems.

Improvements were first determined on to make the car more attractive as a conveyance. A new color scheme was developed to take the place of the time-honored green and yellow that had been standard in Green Bay for many years. This necessitated a study of colors and of their effectiveness in traffic. A very recent French color in one of the new finishes was finally selected for the body of the car. This color borders between an olive and a rich tan and will not show mud or dust. The window sash and casings are of a deep orange, a color with exceptionally high visibility. The car was then striped in black, with extreme lines, giving it the appearance of extra length. The front of the car has been decorated with a 10-in. white stripe, as shown in the illustrations, adding to the neat appearance and acting also as a safety precaution. The roof of the car is black.



One of the large cars has been decorated like the Birney car. Note the white band on the dasher, the floodlighting and the motorman's visor

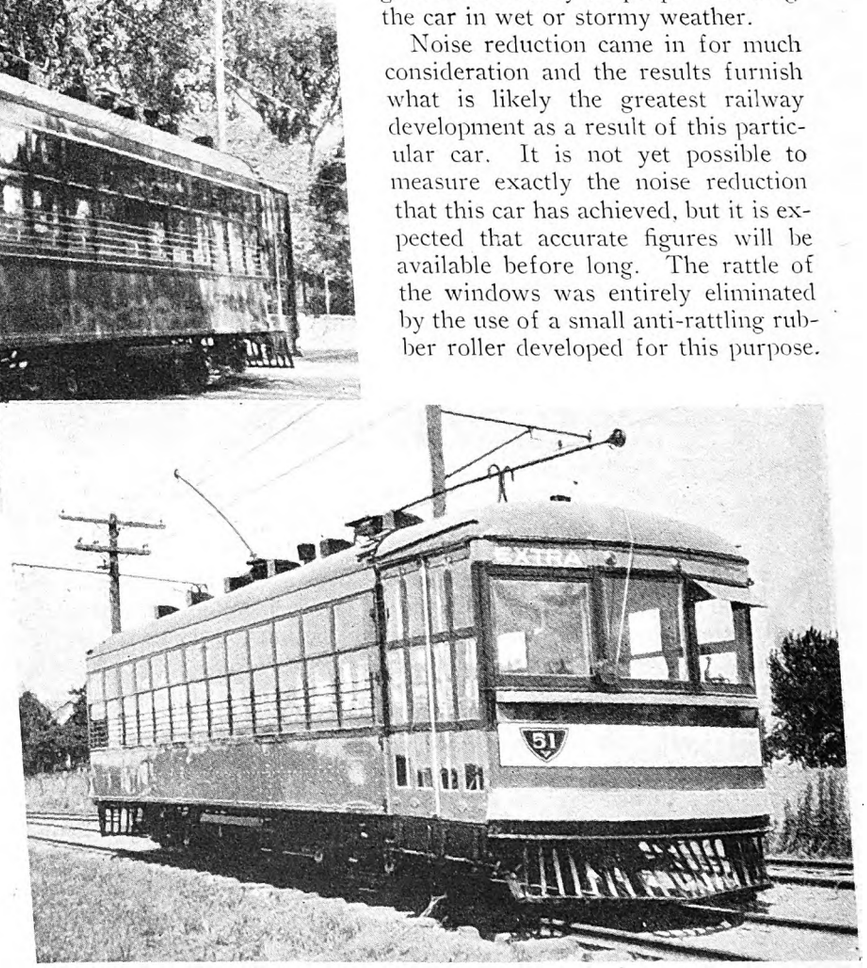
In order to eliminate somewhat the dirty appearance that a car has after it has been out in the rain for any length of time a gutter has been attached to the bottom of the letterboard just above the windows. Realizing that an ordinary gutter would not hold the water when the car was in motion, a good deal of time was spent in designing one that would not spill water except in unusually heavy rains.

The car has been numbered in an unusual manner with an adaptation of the Byllesby shield, the Wisconsin Public Service Corporation being a member of the Byllesby Engineering & Management Corporation system. This shield just to the left of each door carries the car number and the initials of the local company. A small shield on the front of the car also gives the number.

The interior of the car has been decorated in light tan enamel with a white enamel ceiling and a dark green floor with a tan section down the center, between the seats. The illumination in the car has been doubled, adding both to the appearance of the car interior and to the exterior when seen at night from the outside.

In order to promote traffic safety the strip of white mentioned before was placed on both ends of the car. At night this strip and the entire front of the car below the windows are illuminated by use of floodlights concealed below the window line by means of a shield. The contrast between the white section and the tan body of the car is pronounced and is a very definite warning to motorists of the car's presence. It defines the width of the car more effectively than if the front were of any one color, due to the contrast. Safkar steel steps replaced the former wooden steps, with an apparent gain in the safety of people boarding the car in wet or stormy weather.

Noise reduction came in for much consideration and the results furnish what is likely the greatest railway development as a result of this particular car. It is not yet possible to measure exactly the noise reduction that this car has achieved, but it is expected that accurate figures will be available before long. The rattle of the windows was entirely eliminated by the use of a small anti-rattling rubber roller developed for this purpose.



The attractive color scheme adopted for the Birney car was used on one of the larger cars also. The body color borders between an olive and a rich tan while the window sash and casings are a deep orange

The source of what seems to be 85 per cent of the street car noise, that rising from the trucks, wheels and gears, was next given consideration. The wheels and gears have been lined on both sides of the web with eight rubber blocks, bolted through holes in the web. Rubber, as the best known noise absorbent, has been used extensively, following the trend of the bus industry. These rubber blocks reduce the shrill noises of the gears and of the wheels when brakes are applied or when the car is rounding a curve. Large blocks of rubber have been bolted to the journal boxes, journal box covers and gear cases. Long strips have been bolted to the main truck members. The idea has been to absorb or deaden the

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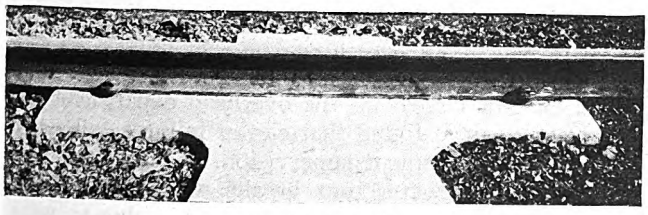
noises as they travel along the metal of the car frame. The side springs are carried on fiber washers and the gear cases are cushioned on rubber pads. In every other place where rubber or fiber could be used to separate metal from metal it has been used. This insulation has eliminated all frictional noises caused by truck members moving against each other.

The car marks an inexpensive attempt to provide more attractive transportation and seems to have accomplished its aim in large measure. Certainly it has evinced many favorable comments.

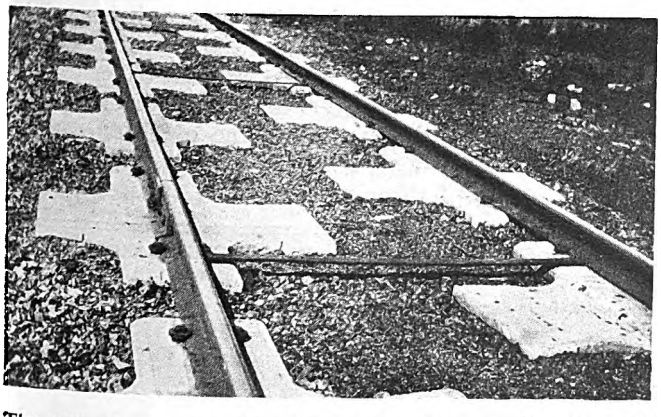
Harmony Line Tests Cruciform Rail Supports

SEVERAL forms of tieless track for interurban use have been tried in the last six years by the Pittsburgh, Harmony, Butler & New Castle Railway, under the supervision of Harry Etheridge, vice-president and general manager. A form has finally been developed which it is believed will meet the requirements of a permanent resilient track subject to the movement of cars weighing 90,000 lb. loaded, and traveling at 10 to 50 m.p.h.

The first stretch of tieless track, laid at Harmony Junction in 1921, was made up of plain concrete blocks composed of one part cement, two parts sand and four parts slag. The blocks were 16 in. wide, 30 in. long and 10 in. thick, with spaces of 10 in. between the supports to allow for jacking up the track. To obtain resiliency, and to avoid grinding away of the concrete by rail movement, each block was recessed for a piece of wood 5 in. wide, 20 in. long and 1 in. thick. The blocks projected ¼ in. above the face of the concrete.



Close-up view of inside leg of the rail support

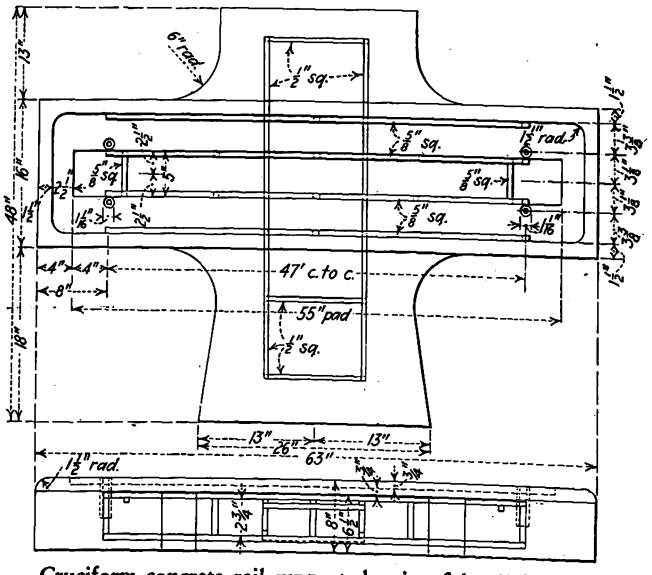


The supports are staggered with respect to the two rails. Tie rods spaced every 16½ ft. hold the rails to gage

A year's experience showed that the wood was not resilient enough to give the desired elastic support for the rails, so a pad of the general consistency of hard rubber tires was designed. This pad was 5 in. wide, 20 in. long and ½ in. thick and was made up of roofing-sheet material, laminated under pressure. Unfortunately, there was not enough bond between these laminations to prevent them from squeezing out with the weight of passing rolling stock. The manufacturer of Carey "Elastite" track filler supplied a material for trial, but this, too, proved too soft. Pads of scrap leather, made up in vertical laminations tied together with end plates and a pair of through bolts, were supplied by shoe manufacturers and given a trial. This combination, however, was too hard for use.

The Carey company produced another combination and this seems to be a permanent cushion for the rail blocks. This cushion is made up with a very flexible "Elastite" pad measuring 55x5x½ in., over which there is placed a harder "Elastite" composition ½ in. thick. This combination has shown extrusion in only five out of twenty blocks and in these cases it has not been serious. The ballast gives both elasticity and permanence and should prove superior to either rubber or leather.

Despite their lack of reinforcement, the original concrete row of blocks gave much better service than might have been expected. Most of them are still free of serious fractures. However, it was realized that for permanence reinforced concrete was essential and in building a ten-block, 60-ft. stretch at Zeigler in October, 1926, the concrete was reinforced with ½-in. square and ⅝-in. square rods, spaced as shown in the accompanying diagram. A mixture of one part cement, two parts sand and three parts slag was used in this construction. An inside stabilizing leg 22x24x7 in. was added to overcome any tendency toward rocking or teetering of the blocks. Since the car wheel pressure is greater near the gage line, rather than at the rail center, it was necessary to offset forces that would turn the block aslant.



Cruciform concrete rail support showing fish-tail form of stabilizing leg and location of reinforcing rods

This construction proved satisfactory, but observation suggested further improvements to keep all forces in equilibrium permanently. Accordingly, when a 25-block, 150-ft. stretch was put down in October, 1927, a counterweighting shoulder was added on the outer side of the rail. The inside stabilizing leg was also changed from a straight-sided to a fish-tail form to secure better anchorage in the center of the ballast. This is the design shown in the accompanying illustration. The cost of this type of construction is placed at about 25 per cent more than construction with untreated oak or chestnut ties which are good for a life of only eight years.

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Analyzing Trolley Line Failures

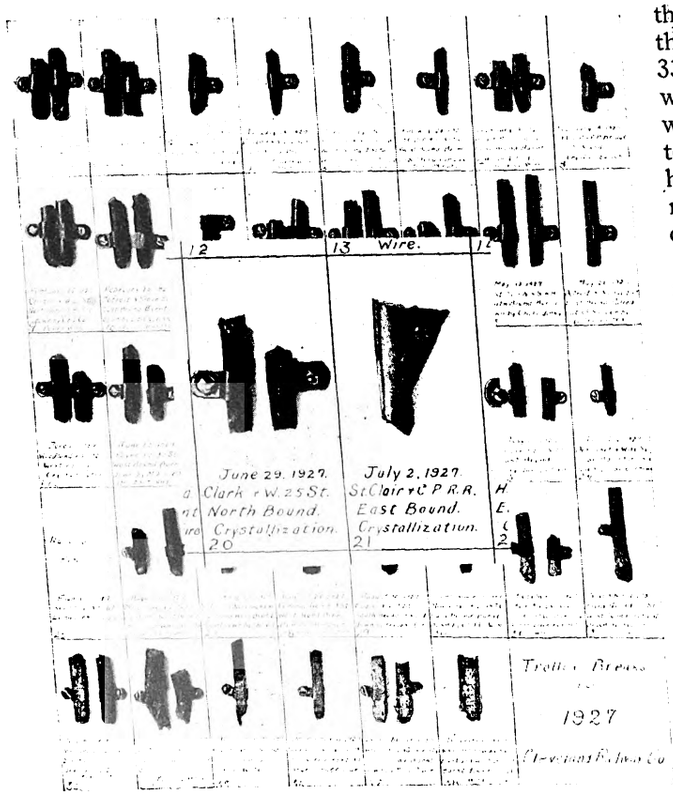
Systematic study of trolley wire breaks, with a visual record formed by the actual broken ends, has made possible a reduction in a year from 70 to 38 total breaks

By Angus G. Scott
Assistant Superintendent of Overhead Lines Cleveland Railway

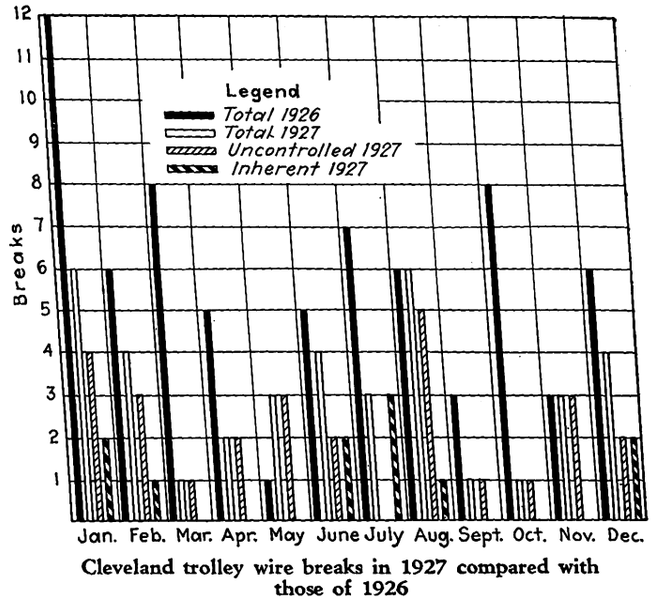
STUDY of trolley wire failures on the lines of the Cleveland Railway has been facilitated by clipping off and saving the ends of each wire break. The pieces, which are 1 to 2 in. long, are mounted on a board as shown in the accompanying picture and then are properly classified as to the cause of breakage. The ends where the failure occurred are always placed downward. Various public utilities the equipment of which was responsible for burndowns are designated by symbols. It is to be noted that the total breaks for the year 1927 numbered 38.

The saving of the ends serves several purposes. The vertical diameter of the wires at the various wire failures can be taken. This gives a check on the carrying out of work and causes for breaks. For instance, crystallization and the effect where it occurs on fittings can be shown to the linemen by a study of the actual wire ends. In this manner the correct classification of the cause of failure is made clear to them.

The samples are mounted on the employees' bulletin board together with the record of total failures and monthly totals of the breaks for the previous year. A visual demonstration is thus given to the men instead of an abstract statement of the number of wire failures and their causes. This has inspired a united effort to eliminate preventable breaks.



Actual broken ends of trolley wires are mounted on a board by the Cleveland Railway to study causes of failure. These represent all the breaks for 1927



Cleveland trolley wire breaks in 1927 compared with those of 1926

A graph of the breaks from all causes, which is self-explanatory, was prepared as shown. The causes are further analyzed in the table. It is interesting to note that trolley wire failures for 1927 show a marked decrease from those of the year 1926. The total fell from 70 breaks in 1926 to 38 in 1927. The total breaks from all causes is now on an average one for every 1,000,000 car-miles traveled, or 0.097 break per single-track mile. The suggested A.E.R.A. measure of efficiency lies between 0.450 and 0.5 break per single-track mile.

Separating the failures into two divisions—namely, those under the control of the overhead department and those beyond—it is found that eleven failures fall under the overhead department supervision, as compared with 33 in 1926. Of these, four breaks were due to worn wire and seven to crystallization. Breaks due to worn wire were 8 per cent less than in 1926. The failures due to crystallization were all of such a nature that it would have been impossible to detect the weakness before occurrence of the failure. No wire that failed due to this cause measured less than 0.300 in. vertical diameter.

Failures beyond the control of the overhead department were 27, as compared with 37 in 1926. The highest single factor in producing trolley wire failures for the

ANALYSIS OF TROLLEY BREAKS IN 1927, CLEVELAND RAILWAY

Trolley Breaks from All Causes

	1927	1926
Uncontrolled:		
Burnt down by foreign shovel	2	
Burnt down by Cleveland Railway wires	1	
Burnt down by foreign wires	13	
Burnt down by foreign cars	3	
Burnt down by Cleveland Railway cars	4	
Pulled out of splices by Cleveland Railway cars	1	
Building	1	
Fire	1	
Unknown	1	
	27	37
Inherent:		
Worn wire	4	
Crystalization	7	
	11	33
Total breaks from all causes	38	70

Location of Trolley Wire Breaks

Due to worn wire:		Due to crystallization:	
In section	0	At end of section insulator	4
At end of ear	0	At end of crossing	1
Under ear	4	In curve	0
Under structure	0	Bridge structure approach	2
At end of splice	0		
Total	4	Total	7

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year was that of burndowns by foreign lines. These totaled thirteen, which was 34 per cent of the entire number of breaks on our lines.

Upon analysis of the various seasonal peaks it was found that they follow certain trends year after year. A high peak is reached in the summer months due to burndowns, and another comes in December and January.

A matter of interest is that between June 29 and July 17, 1927, four of the seven crystallization breaks occurred. This has been attributed to several causes, such as the weather and expansion of the wire. None of these reasons satisfactorily explains the phenomena.

The board for 1928 has been prepared with only 30 spaces for breaks. Unless unforeseen contingencies arise, such as sleet or wind storms, we expect to stay within this limit. Nevertheless there is plenty of room on the back.

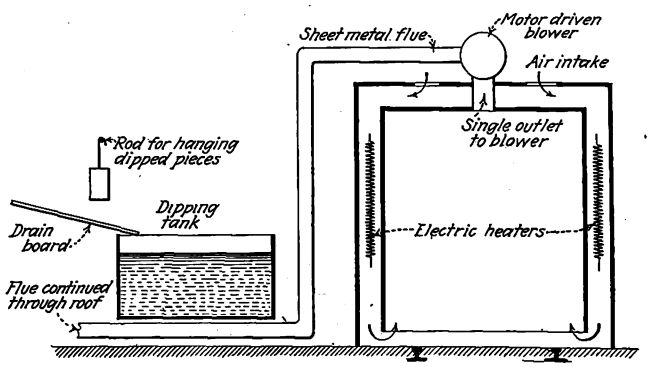
Baking Enamel Used for Many Parts in Twin Cities

ENAMELING of many parts used on electric railway cars, such as window guards, car steps, stanchions, fare boxes and the like, is standard practice of the Twin City Rapid Transit Company. Baking enamels are used, and in almost every instance the parts are dipped, so that all brush work is eliminated. This results in a considerable saving of labor, according to Joseph Gabler, foreman of the paint shop.

As the air temperatures in St. Paul, Minn., in which city the shop is located, are very low in winter some difficulty was experienced with the dipping process, as the enamel would become so stiff that it failed to drain satisfactorily. Accordingly a combination of dipping tank and oven was devised that provided sufficient heat to make the dipping process satisfactory.

The baking oven is 9 ft. wide by 12 ft. long and 7 ft. high. It was made by the Despatch Manufacturing Company of Minneapolis. It is similar to armature baking ovens except that it is somewhat larger. The walls are of heat-insulating material and are double. Air is admitted between the outer and the inner walls, as shown in the line drawing. It passes downward through resistance heaters, controlled by a thermostat, and enters the interior of the oven at the bottom. After passing over the pieces being baked the heated air is exhausted through a motor-driven blower on top of the oven. From here it passes through a rectangular sheet-metal flue, downward and beneath the dipping tank, which is placed close to the oven. After circulating beneath the tank the exhaust air is carried in a flue upward through the roof, so that the fumes from the evaporated solvents are kept out of the shop. This was found particularly necessary in the wintertime, since heating the shop is difficult at best.

Small pieces, such as fare boxes, are suspended from S hooks and dipped by hand. They are then hung to drain on a rod above a drainboard, so that the surplus enamel runs back into the dipping tank. Larger pieces, such as the rear step assembly shown in the illustration, are hung on a hand crane. They may be lowered into the tank, lifted for drainage and then swung out of the way while thus suspended.

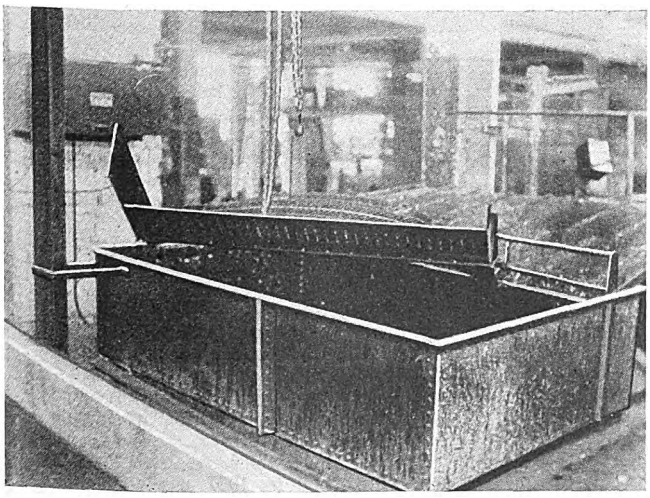


Section of dipping tank and baking oven, showing method of warming tank with waste heat from the oven

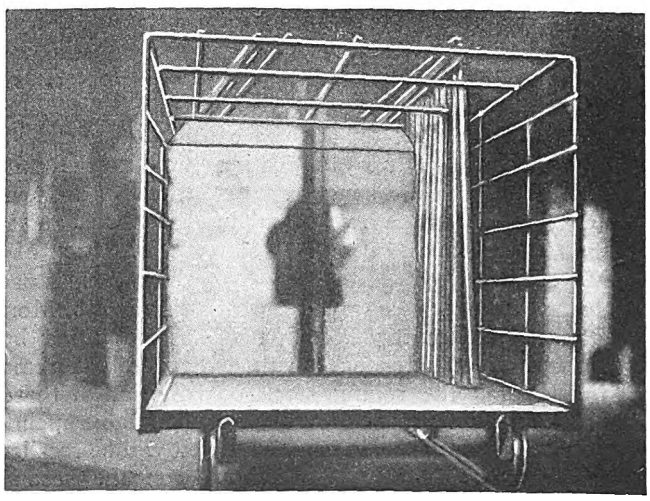
After dipping and draining, all of the parts to be baked are placed on a truck which caries a framework for suspending the small pieces and supporting the large ones. This is shown in another illustration. When the truck is filled it is run through the opened doors of the oven, the doors are closed and the baking takes place.

Enameling is done in a variety of colors, as desired. The blacks are baked at a temperature of 450 to 500 deg. F. for about one hour. Lighter colors cannot stand such a high temperature, being baked at 250 to 300 deg. F. for 2½ hours. The parts are then completely dry and ready for use.

The enameling has been found a very satisfactory method of finishing miscellaneous parts. It is durable and readily cleaned. When pieces are dipped in any considerable quantity, as they are in this shop, there is a distinct economy over other finishes ordinarily used.



One of the dipping tanks. An entire rear step assembly is suspended over the tank for draining



All pieces are placed on this truck for baking, which takes place in the oven at the rear

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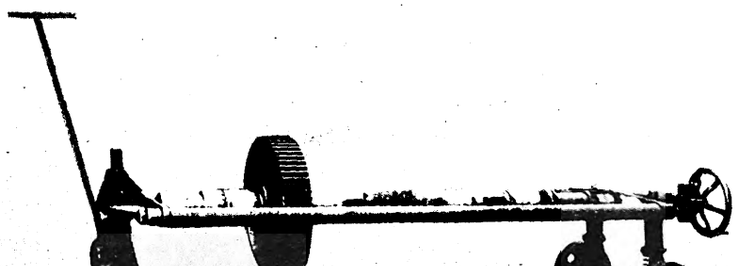
Second Monthly Prize Won by A. Taurman

A truck with centers for testing axles that may be bent also used in the straightening process was awarded the $25 monthly prize for January in "Electric Railway Journal's" Maintenance Competition. A convenient attachment for pulling spikes submitted by Joseph Mercier receives honorable mention



Truck for testing axles, and for straightening them at the shops of the Birmingham Electric Company

STRAIGHTENING of bent axles by heating them, and then putting them in a lathe has been improved on by a method used in the shop of the Birmingham Electric Company, Birmingham, Ala. A truck with convenient centers for testing the axles, and on which they are straightened by means of a vertical hydraulic press, was described in the Maintenance Data Sheet Section of ELECTRIC RAILWAY JOURNAL for Jan. 21, 1928. This was awarded the monthly prize of $25 by the judges. A description of the device was submitted by A. Taurman, superintendent of equipment, way and structures, for the Birmingham Electric Company. This is the second monthly prize that has been won by Mr. Taurman, as his article on the use of Alemite fittings for lubricating half-ball brake hangers was awarded the monthly prize in the Maintenance Contest for May, 1927.

Mr. Taurman is giving great attention to improved equipment and better maintenance methods for keeping the rolling stock on his progressive property in the best possible condition. He is active in the Electric Railway Association of Equipment Men, Southern Properties, and was chosen vice-president at its recent meeting in New Orleans, Jan. 25-27, after having served as secretary. Biographical notes of Mr. Taurman's experience were published in the June 18, 1927, issue of ELECTRIC RAILWAY JOURNAL.

The truck described has a threefold function. First, it provides a convenient means for testing eccentricity. Second, it provides a vehicle for transporting axles about the shop, and third, the axle can be straightened cold without removing it from the truck. A material saving in time and labor has resulted from its use.

Tie plates or cramped quarters sometimes interfere with effective removal of spikes, and prevent the use of a claw bar. The adaptation of the common form of ice tongs in a device for attaching to the spike, and for providing for the insertion of a lever to remove the spikes, as used by the Montreal Tramways, Montreal, Canada, and as submitted by Joseph Mercier, general foreman track service division of that company, received honorable mention by the judges. It will be recalled that Mr. Mercier won the second capital prize in the Maintenance Contest, which was awarded at the Cleveland Convention last October. A short biography of Mr. Mercier was published in the Annual Convention Number of ELECTRIC RAILWAY JOURNAL, dated Sept. 17, 1927.

TIME FOR SUBMITTING CONTEST ITEMS BECOMING SHORT

ACCORDING to the rules of the competition, manuscripts to be eligible for one of the monthly prizes must be submitted before April 30, 1928. This leaves but 2½ months remaining for those interested to get in their material. Many of those who have already submitted items in the contest have advised that they intend to submit additional items. A certain advantage will be gained by sending these in early, since space limitations prevent the publication of out a limited number in each group. It is evident that the articles published so far in the maintenance competition treat of only a few of those advanced practices which can be found in every maintenance department. In a visit to a moderate sized shop, the maintenance editor secured more than 50 items, all of a nature similar to those which are now being published in the competition.

The Maintenance Data Sheet Section in this issue contains another group of articles which were submitted in the competition. One of these will be awarded the $25 monthly prize for February. Results of the contest each month are published in the next issue devoted to maintenance and construction, which is the third issue each month.

* * *

The prizes offered are $25 for each monthly winner, to be selected from the articles published in the maintenance data sheet section. A minimum of $5 will be paid for each article accepted for publication.

Any employee of an electric railway or bus subsidiary may compete. The subject may be any maintenance practice or device for electric railway or bus repairs. Articles should be 100 to 200 words long with one illustration, and in no event longer than 400 words with two illustrations. Manuscripts should be mailed to the editor of ELECTRIC RAILWAY JOURNAL, Tenth Avenue at 36th Street, New York City, on or before April 30, 1928.

Additional details were given in this paper for April 16, 1927, pages 700-701.

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Electric Railway Journal Maintenance Data Sheet

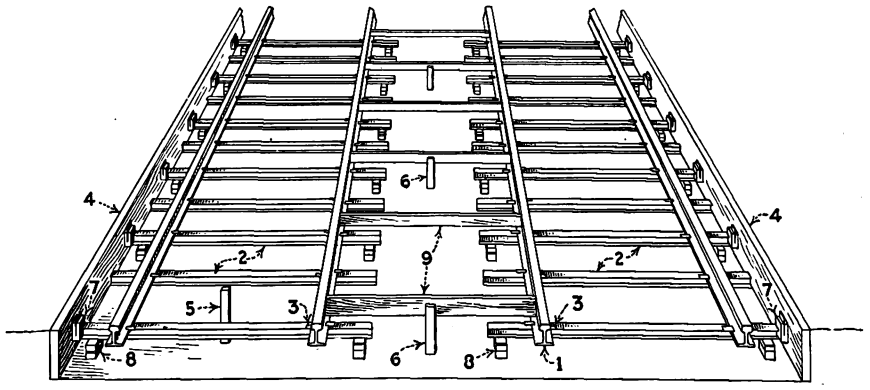
TRACK AND WAY DEPARTMENT—17

Conditioning Double Track for Concreting*

By Louis T. Botto
Superintendent Maintenance of Way Department,
San Antonio Public Service Company, San Antonio, Tex.

IN THE work of preparing double-track lines for concreting as carried out by the San Antonio Public Service Company, the tracks are left on the subgrade until a sufficient quantity of material has been hauled in and placed at suitable intervals to supply the mixer for at least a day's run. The hauling of materials then continues ahead of the work as it progresses.

Three crews of men are employed in conditioning the tracks for concreting. The first is the leveling crew which consists of a leveler and three men. Grade stakes are placed on 30-ft. centers in the center of the track not used by the work trains, and the actual leveling is carried out in two operations. Tracks are first raised to approximate grade by blocking under every other tie for about 100 ft. ahead of the mixer.



1- 60 lb. tee-rail
2- Standard 6 ft. Carnegie steel tie, 30" on center
3- Special 3/4"x2" bolts and clips
4- 2"x12" boards used as concrete form
5- Grade stakes 30-ft. apart. Red tops. Green tops indicate break in grade.
6- Line stakes 10-ft. apart, Plane tops. With tack on center line
7- Wood blocks and wedges used to line track and hold it stationary while pouring concrete
8- Bricks, blocks and shingles used to grade track
9- 2"x4" braces to hold dummy gage

Track conditioned for concreting

The process is then repeated and the tracks are brought to a true grade as indicated by the grade stakes. This is accomplished by the use of cypress shingles wedged on top of the blocking placed previously. On tangent tracks the two inside rails are made level with the grade

*Submitted in Electric Railway Journal Prize Contest.

(OVER)

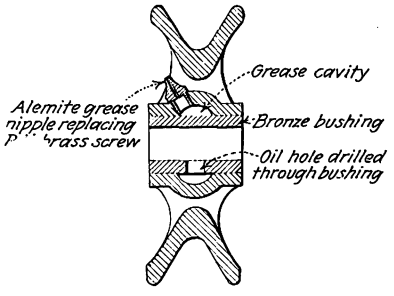
Electric Railway Journal Maintenance Data Sheet

ROLLING STOCK—MISCELLANEOUS—22

Grease Lubrication for Trolley Wheels*

By L. A. Brammer
Shop Superintendent Jamaica Public Service Company, Kingston, Jamaica, B. W. I.

FOR a long time the maintenance of trolley wheels has been a large item of expense on cars of the Jamaica Public Service Company. The wheel bushing, which is of the usual type of bronze filled with graphite, is lubricated with oil through an oil hole closed by a small brass screw, 1/4 in. in diameter. Oiling was carried out on cars every night after a run of about 120 car-miles. The service obtained did not exceed 1,500 miles before chattering of the bushing and screeching of the wheel would occur. Ordinarily one wheel would wear out about four bushings before scrapping. A messy condition of the rope and roof was sure to result.



Alemite grease fitting applied to trolley wheel

To improve this condition the screws in the trolley wheels were replaced with Alemite fittings for grease lubrication and a regular grease gun with No. 00 density grease was used. Since the installation of these fittings lubrication is done but once every two weeks and the life of bushings has increased so that but two per wheel are now used. Rope and roofs remain clean, and to add to the appearance the roofs have been painted with aluminum paint. One pound of grease is now used every two weeks where originally two quarts of oil were consumed each night. The accompanying illustration shows the method of installing the Alemite fittings.

*Submitted in Electric Railway Journal Prize Contest

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Electric Railway Journal Maintenance Data Sheet

TRACK AND WAY DEPARTMENT—17

Conditioning Double Track for Concreting—Continued

stakes and the two outside rails are depressed a half inch.

A second crew sets the forms which are usually made of 2 in. x 12 in. boards in 16-ft. lengths. Two men work on each side of the tracks, place the forms and make them secure for the liners who follow them. The top of the forms is usually made to conform to the grade of the outside rails.

The third crew, which lines the tracks, is composed of five men. They work from a line of stakes placed on 10-ft. centers in the center of the dummy strip. Two of this crew key the tracks and secure them to exact line at each center stake by means of 2-in. x 4-in. spacers cut to exact length and placed between the heads of the two dummy rails to hold the exact gage, using blocks and wedges. The other three men follow the first two and complete the lining. One, by sighting down the rail, directs the other two in placing additional wedges, spacers or blocks to work the tracks between the stakes to exact alignment. After the concrete has set for about two hours, the spacers and any wedges that stick up out of the concrete are removed and are reused in the work ahead.

The crews employed on this work in San Antonio have had many years of experience and have become expert in their respective lines. They can condition for concreting 500 lineal feet of double track in eight hours. A great advantage in lining and surfacing tracks is obtained by placing the grade and line stakes, as outlined, close together, thus permitting the instrument man to do a very great part of the work.

Electric Railway Journal Maintenance Data Sheet

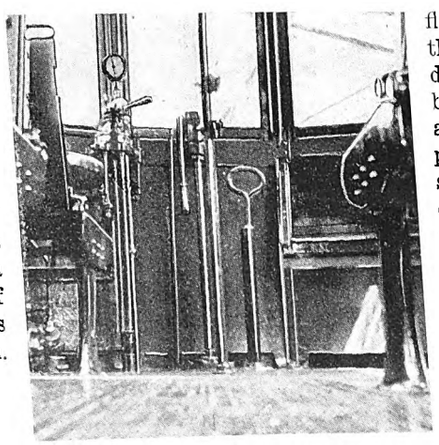
ROLLING STOCK—MISCELLANEOUS—23

Convenient Receptacle for Switch Irons*

By R. T. Chiles

Master Mechanic Cumberland County Power & Light Company, Portland, Me.

Considerable trouble was experienced on cars of the Cumberland County Power & Light Company in keeping switch irons in place, due to not having a regular position. When they were hung on a support the inside trim of the car was damaged by the swinging of the switch iron. To overcome this trouble the company now uses a pipe receptacle. This is made of 1½-in. pipe 20 in. long. One end is threaded and is screwed to a 1½-in. floor flange. A round steel plate ⅛ in. thick of the same diameter and drilling as the floor flange is placed between the car floor and the flange and the receptacle is screwed in place. The steel plate prevents the switch iron from cutting holes in the car floor. Every car is equipped with two switch irons, each made of ¾-in. round soft steel, 28 in. over all in length and with a D-shaped handle. Receptacles for the switch irons are provided at each end of the car.



Handy type of switch iron receptacle used by the Cumberland County Power & Light Company

*Submitted in Electric Railway Journal Prize Contest.

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Electric Railway Journal Maintenance Data Sheet

TRACK AND WAY DEPARTMENT—18

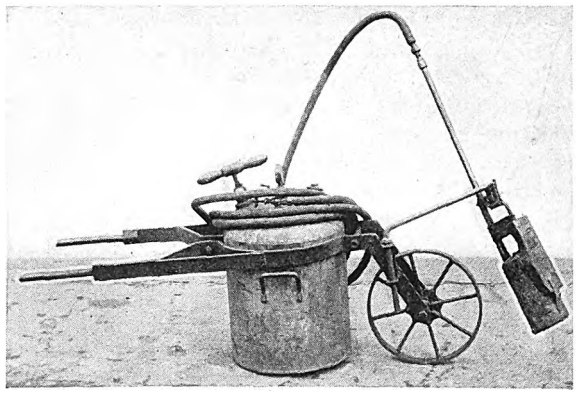
Oil Heaters for Thawing Frozen Switches*

By R. J. Fennell
Assistant Road Master Way Department
Toronto Transportation Commission, Toronto, Canada

PORTABLE type oil heaters are used during cold weather to overcome ice and frost when making paving repairs, to thaw out frozen switches and derails and to preheat rails for welding. Economy and flexibility have been gained through the use of a barrow type tank holder.

These heaters are of the high-pressure oil-burner type. They consist of a burner, a rubber hose and a 15-gal. fuel storage steel tank. Previous heaters of similar general type required two and frequently three men, depending on the class of work.

The barrow type tank holder has an adjustable arm that allows the burner to be set to any desired position. Meanwhile the operator manipulates the flame by movement of the barrow. The equipment is compact, which is of advantage for rapid clearing of track where work is done under traffic. Only two men are required for operation.



Barrow type tank holder for portable track heater

*Submitted in Electric Railway Journal Prize Contest.

Electric Railway Journal Maintenance Data Sheet

ROLLING STOCK—MISCELLANEOUS—24

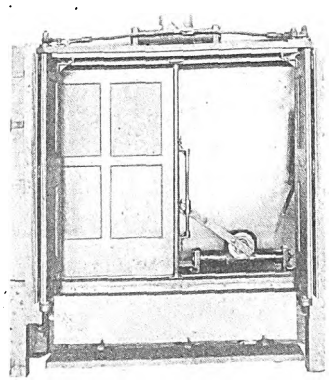
Test Equipment for Door Engines*

By G. R. Fanning
Foreman Pneumatic Section Hillcrest Shops,
Toronto Transportation Commission, Toronto, Canada

FOR testing door engines for leaks, speed and amount of cushioning, a platform with a heavy wooden frame, on which doors and a step are hung, is used in the shops of the Toronto Transportation Commission. The folding doors on this testing set are reduced in size to 4 ft. high x 4 ft. 9 in. wide over all, so that the engine can be handled easily. To compensate for this the panels of the doors are filled in with iron plates so that they have exactly the same weight as the doors used on cars in service.

Door engines, after being overhauled, are placed on a bed and are held there by two solid pins in the bedplate. The arms are left in position on the door adjusting screws and when the pin is placed through the gear shaft and arms, the door is immediately ready for test. While a door is being operated, leaks are found readily and are repaired. Also the speed of the doors and the amount of cushioning can be adjusted easily so that, when the engine is installed on the car, continuous service is assured and no time is lost through faulty operation.

The sliding doors are hung under the bedplate of the folding doors and weighted to correspond with doors in operation on cars, being reduced in size to 3 ft. 9 in. by 3 ft.



Door engine test equipment

*Submitted in Electric Railway Journal Prize Contest.

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Electric Railway Journal Maintenance Data Sheet

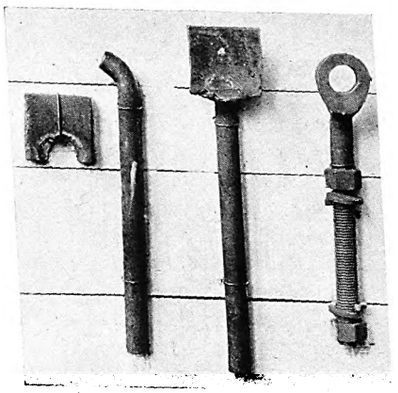
TRACK AND WAY DEPARTMENT—19

Connecting Rod for Electric Track Switches*

BY P. F. GERHART
Superintendent Line Department, Harrisburg Railways, Harrisburg, Pa.

DUE to increased weight of track switch tongues, difficulty has been experienced by the Harrisburg Railways from the usual type of connecting rod used with switches when electrically operated. To overcome the difficulty, rods are now made in the company's shops. A piece of 1-in. round soft steel is cut to the required length. By clamping it to the welding table the protruding end is shaped by being heated with a torch and bent to the proper angle with a piece of 1-in. pipe.

For forming the end which is to contain the eye, a piece of 1-in. flat soft steel 3 in. square is notched out on one side by the acetylene torch. This is welded to the round rod. In the welding the rod is raised 1 in. above the welding table, the square piece resting on the table. This makes an offset of 1 in., which is just right for use on this property. The outside of the eye is dressed up with an acetylene torch and the hole for the connecting link is drilled. The rod is then threaded for 1-in. nuts. In some places the standard 1-in. nuts are too large on the outside, and to meet this condition $\frac{7}{8}$-in. nuts are tapped out with 1-in. threads, and used.



The finished rod for the connecting links of electrically-operated switches is shown at the extreme right. The small square piece of iron on the left is welded to the bent arm of the rod shown next to the right. The finished rod, before machining, is shown in the third illustration

Submitted in ELECTRIC RAILWAY JOURNAL Prize Contest.

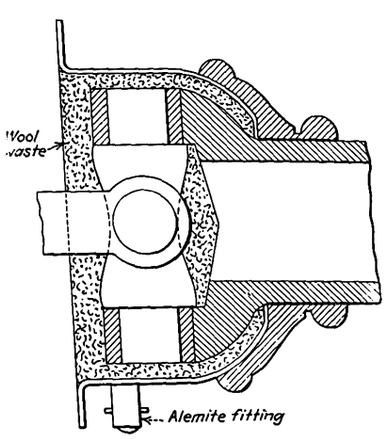
Electric Railway Journal Maintenance Data Sheet

ROLLING STOCK—MISCELLANEOUS—25

Wool-Waste Packed Universal Joints*

BY CHARLIE HERMS
General Foreman San Diego Electric Railway, San Diego, Cal.

THE accompanying sketch shows a wool waste packed universal joint as used by the San Diego Electric Railway. When packing this joint, a good grade of long-yarn wool waste is used and this is soaked not less than 72 hours in a good grade of transmission grease, preferably one having a fiber base. The universal joint should be opened enough so as to permit free insertion of the waste and this should be packed tightly. Strands of waste should be just as long as possible as results will be better with long-yarn waste. After the joint is packed and assembled it should be filled with a good grade of universal joint grease by means of forced lubrication. Heavy transmission grease has been found most satisfactory by the San Diego Electric Railway.



Wool waste lubricated universal joint

By use of waste packed universal joints the throwing of the grease is eliminated, which is common with most all makes of joints due to centrifugal force. The replacement of worn-out universal joints is reduced since more perfect lubrication is obtained. The time and labor of lubrication is considerably less with the wool waste packed joints since there is very little lubricant used and there is no danger of the joint running dry if inspected at reasonable intervals.

Submitted in ELECTRIC RAILWAY JOURNAL Prize Contest.

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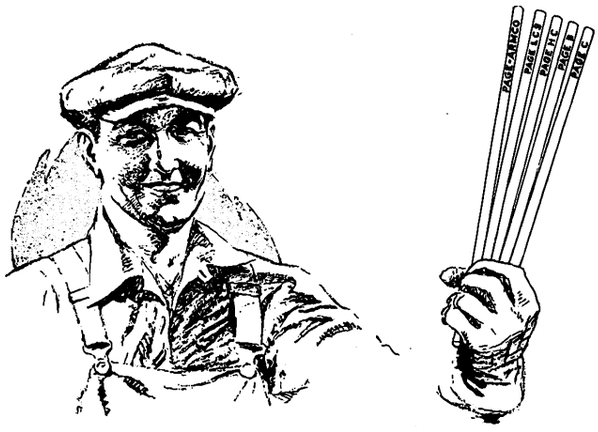

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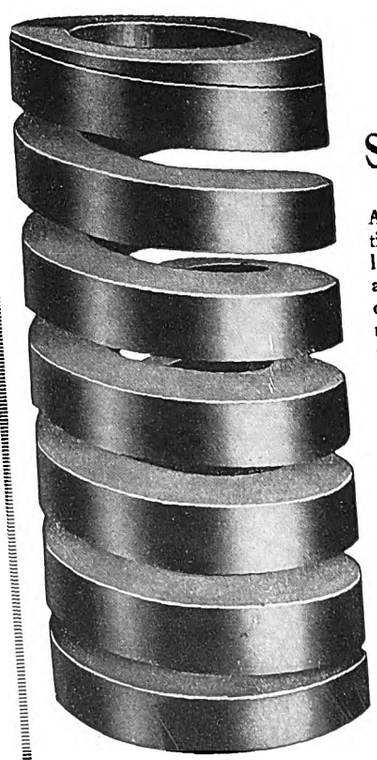

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Electric Railway Journal Maintenance Data Sheet

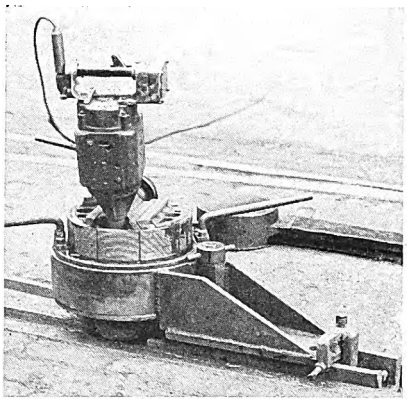
TRACK AND WAY DEPARTMENT—20

Machine for Grinding Heel Recess in Switch Castings*

By W. J. McCallum
Foreman Frog Shop Way Department, Toronto Transportation Commission, Toronto, Canada

SWITCH castings worn oversize at the heel recess are rehabilitated by the way department of the Toronto Transportation Commission, Toronto, Canada, which has developed the grinding machine shown in the accompanying illustration. When the tongue and casting are worn beyond allowable limits, the heel recess is built up first by welding, using manganese rods, and then is ground out to standard diameter by the grinding machine. All of this work is done at night.

The machine has a bracket to hold and control a portable electric hand grinder which is provided with vertical and horizontal feeds. By means of an annular guide, the grinder is capable of being swung through a complete circle. It is held in position by clamping the extension arm into the recess left by the switch tongue. The arm is made reversible for right- and left-hand castings. Car passes are permitted during the progress of the work by removing the grinder and dropping in a temporary tongue with a small heel. In this way oversized recess castings are made standard and undersized tongues are taken to the shop where repairs are carried out in a similar manner.



Equipment used for grinding the heel recess in switch castings

*Submitted in Electric Railway Journal Prize Contest.

Electric Railway Journal Maintenance Data Sheet

ROLLING STOCK—ELECTRICAL—40

Automatic Test for Control Jumpers*

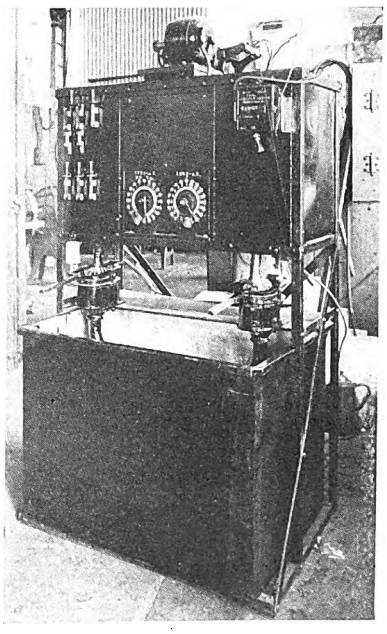
By Harvey L. Bullock
General Foreman of Electrical Equipment North Station, New York Central Railroad, White Plains, N. Y.

FOR testing electric car jumpers to comply with the I.C.C. rules for inspecting and testing locomotives other than steam, a machine has been designed and built in the electric shops at the White Plains, north station of the New York Central Railroad. The rule provides that jumpers used between units carrying a potential of 600 volts or over shall be tested by immersing the cable portion in water and subjecting each conductor, one with the other, and with the water, to a difference in potential of not less than 1¼ times the normal working voltage for a period of not less than one minute.

With the equipment provided, all that is necessary is to start the machine. If a conductor is defective, the machine comes to a stop, cuts off the high-tension current and rings a bell to call the attendant, the defective wire being indicated on a dial. The machine stops automatically when the test is completed.

A timing element is provided in the equipment which energizes a magnet valve, which in turn allows compressed air to operate a small air cylinder connected to a series of star wheels, levers and cams. Connections are interlocked with the contacts on the dial to allow exact timing. The dial at the right as shown in the accompanying illustration moves every minute, and the dial on the left moves every twenty minutes. When this latter dial has made one complete revolution, the test is complete, there being twenty wires in the jumpers used on the New York Central locomotives.

This device not only saves the time of an operator several hours per day but is also a safety measure on account of obviating the handling of the high-tension current.



Machine for testing jumpers used between electric locomotives and cars by the New York Central Railroad

*Submitted in Electric Railway Journal Prize Contest.

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Electric Railway Journal Maintenance Data Sheet

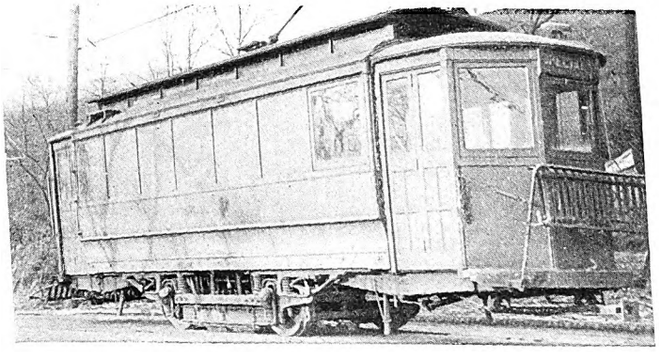
TRACK AND WAY DEPARTMENT—21

Grinding Out Rail Corrugations*

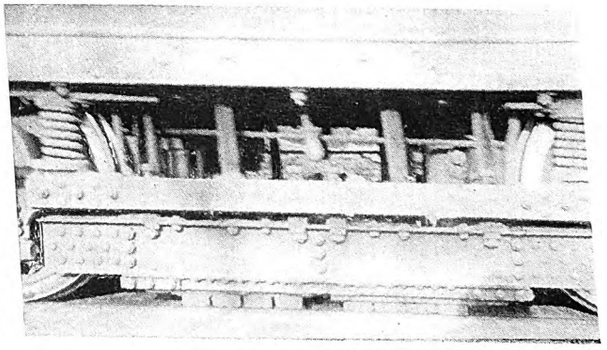
By F. J. Martin
Superintendent of Maintenance Pittsburgh Railways, Pittsburgh, Pa.

Rail corrugations are ground out with two shop-constructed cars on the Pittsburgh Railways, Pittsburgh, Pa. Obsolete single-truck cars were rebuilt to house the air cylinders and grinding block-adjusting mechanism. A 25-ft. compressor supplies the air for the cylinders, which furnish the pressure to the grinding blocks. Two 16x60-in. air reservoirs and a 275-gal. water tank are housed inside the car body.

The air cylinders that furnish the pressure for the grinding blocks are controlled by modified Westinghouse M-20 brake valves. They can be operated by the motorman from either end of the car. The grinding bricks used are of standard material 2½x4x10 in. They are held in a cast-iron box 24x3 in. There are two boxes on each side of the car, each box holding four bricks separated by standard spacers.



Exterior view of rail grinding car



Support for grinding blocks

*Submitted in Electric Railway Journal Prize Contest.

Electric Railway Journal Maintenance Data Sheet

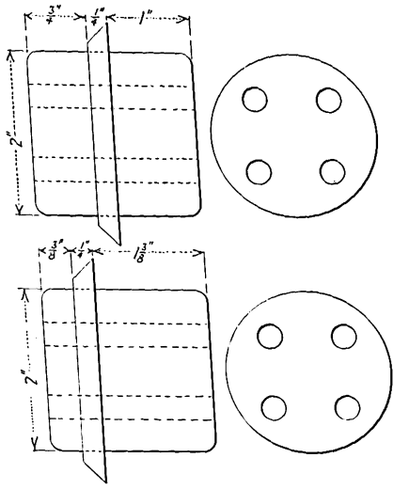
ROLLING STOCK—ELECTRICAL—41

Bushing for Carrying Motor Leads Through Frame*

By Benjamin H. Hall
Shop Foreman West Penn Railways, McKeesport, Pa.

Insulating bushings of the type illustrated are used by the West Penn Railways for carrying motor leads of Westinghouse No. 56 motors through the cast-steel motor shell. All armatures and field leads which connect to the main car cables pass through this bushing. It is made from ash and then dipped and baked in insulating varnish to insure more perfect insulation. After the wires are put through the bushing they are taped with a couple of layers of heavy tape and a layer of canvas. This provides good insulation and protection against water and mud.

A similar type of bushing but of different dimensions was used previously. With the old-style bushing, the extension on the outside of the motor case was but ⅜ in. and the tape and canvas would not stay on. Splashing of water caused considerable trouble. The old bushing also did not support the wire sufficiently to prevent vibration of the leads while cars were rounding curves. The leads would work back and forth and twist off the strands. The new-style bushing is made with a ¾-in. extension outside of the motor case. This additional amount is satisfactory for taping so as to hold the leads more rigid. It is held in place by a brass collar that fits over a shoulder on the bushing and is fastened to the motor case by 2½-in. No. 14-24 round head machine screws.



Insulating bushings for Westinghouse 56 motor. At top, new style of bushing; at bottom, old style which has given trouble

*Submitted in Electric Railway Journal Prize Contest.

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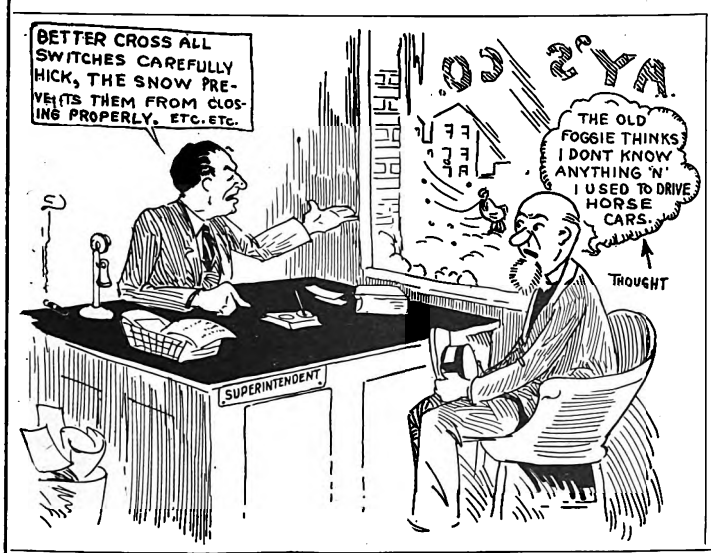
Adventures of

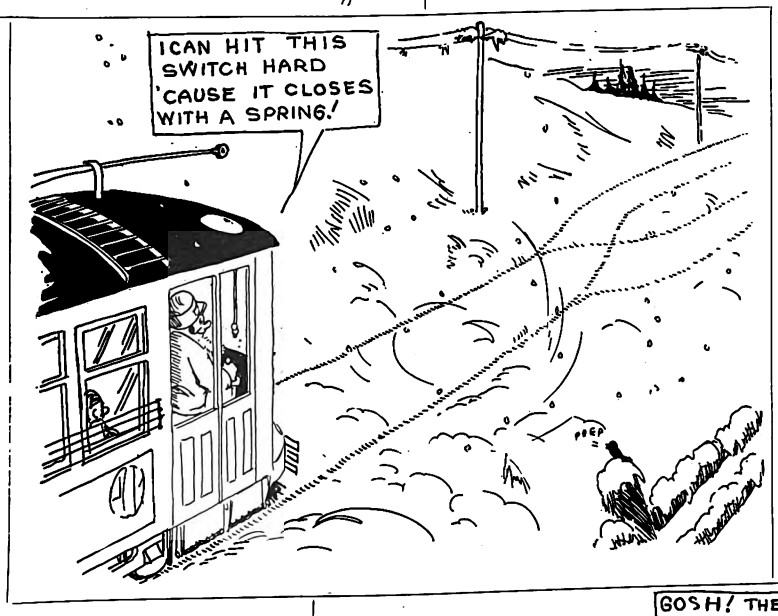
Old Man Trouble

on the

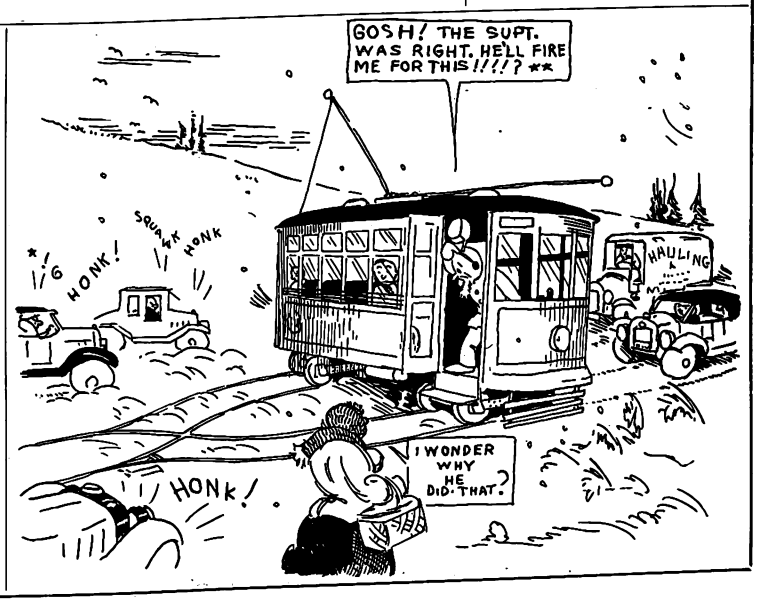
Hicksville Railway



Because switches are operated by electric power or a spring is not sufficient reason to assume that they are closed



SNOW, ice, sand and dirt prevent mechanically operated switches from fulfilling their duty during snow and rain storms. Time and repairs are saved by stopping the car before pulling across a switch point which cannot be seen. If a fast-moving car splits a switch, the brakes cannot be relied upon to stop the car before the motor leads and brake riggings are stripped.



ELECTRIC RAILWAY JOURNAL will be glad to furnish press proofs of this page for posting on bulletin boards and will supply electrotypes of this series at cost for use in company publications.

J. M. Zimmerman and E. L. Proctor, West. Elec. & Mfg. Co.

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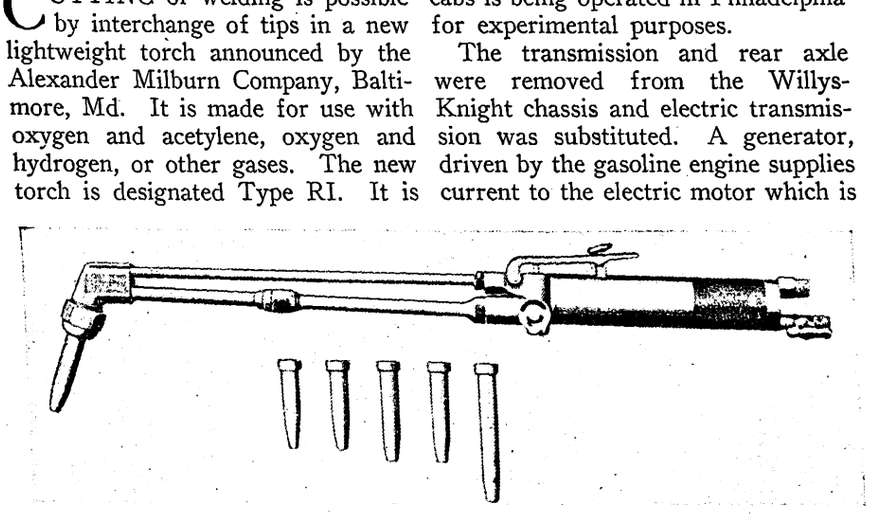
New Equipment Available

Combination Cutting and Welding Torch

CUTTING or welding is possible by interchange of tips in a new lightweight torch announced by the Alexander Milburn Company, Baltimore, Md. It is made for use with oxygen and acetylene, oxygen and hydrogen, or other gases. The new torch is designated Type RI. It is extremely light for the range of work it performs, weighing 40 ounces. Only two gas tubes are used instead of three, as is common in other torches. The high-pressure cutting oxygen thumb button, which remains fixed in either open or closed position without sustained pressure, and the bronze forged torch head and valves having a tensile strength of 60,000 lb. per square inch are additional features.



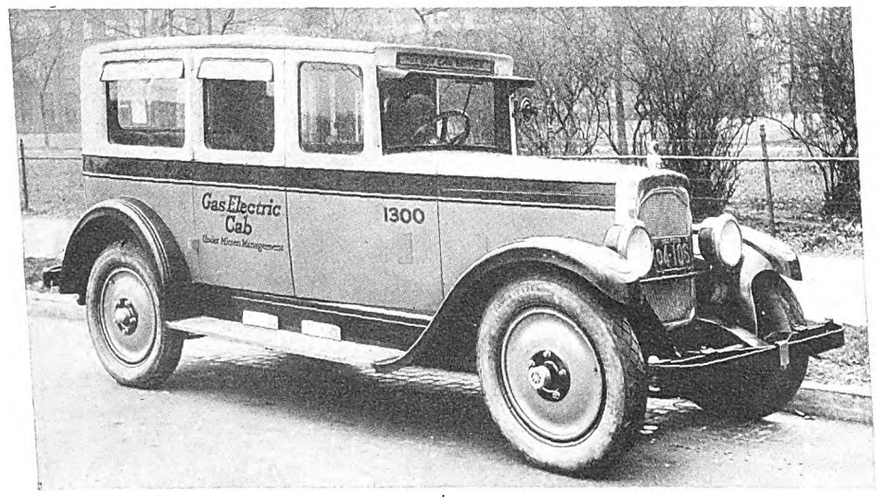
Combination cutting and welding torch

Gas-Electric Cab

GAS-ELECTRIC drive for taxicabs is the latest development in the transportation field. The drive has been designed by Mitten Management engineers, and constructed under their supervision, with General Electric Company equipment, on a Willys-Knight chassis. One of these cabs is being operated in Philadelphia for experimental purposes.

The transmission and rear axle were removed from the Willys-Knight chassis and electric transmission was substituted. A generator, driven by the gasoline engine supplies current to the electric motor which is attached to the frame, and which drives the propeller shaft. There is no gear lever or clutch, the accelerator increasing or decreasing the speed in accordance with the pressure exerted by the foot. The only other foot lever is the brake pedal. The cab is placed in reverse by a small switch attached to the driver's seat.

Smoother and quicker acceleration, especially desirable in taxicabs which operate in heavy traffic, as well as lower maintenance cost and longer life, are outstanding advantages claimed for the gas-electric cab. A feature is the right-hand door to the back compartment which is controlled by the driver and which can be opened only from the driver's seat. This precaution was taken as a safety measure for passengers who might possibly attempt to alight with the cab in motion or with an obstacle in the way. The interior of the cab is upholstered in mohair and has been designed to provide ample seating room for five passengers.

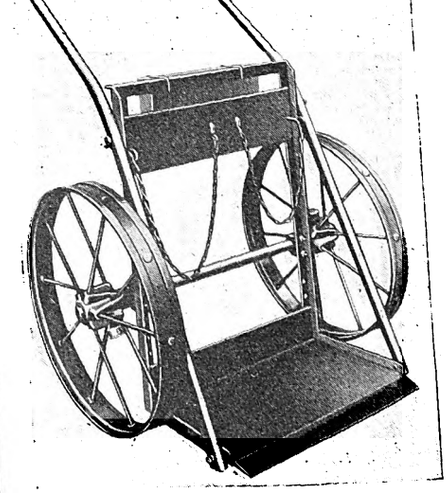


New type of gas-electric taxicab being tested in Philadelphia

Large Wheel Truck for Oxy-Acetylene Equipment

LARGER wheel size was a primary consideration in the design of a two-wheel truck put on the market by the Oxweld Acetylene Company, New York, N. Y. Larger wheels make the truck much easier to handle. The illustration shows the new truck equipped with 24-in. steel wheels, having 3-in. x $\frac{3}{8}$-in. grooved tires and a cast-iron hub. The hub is bored to fit the cold-rolled steel axle and a grease cup is provided. Lubrication is of particular importance where the truck may be hauled long distances at fairly high speed behind a motor truck.

Among other improvements, the handle is continuous and the upper portion is bent back about 8 in. so that the truck can be handled easily by an operator of small stature. The tool box is large and is provided with a cover and a holder for extra blowpipe tips.



Truck with 24-in. wheels

Where 24-in. wheels are not required, 14-in. wheels may be used instead merely by changing the position of the axle to the lower set of holes which are already drilled in the frame. The same frame and axle can be used with either size wheels. No grease cups are necessary with the smaller wheels.

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Small Blow Torch Outfit

FOR operations such as soldering and brazing where a low-flame temperature can be used to advantage, an inexpensive outfit has been developed by the Prest-O-Lite Company, Inc., New York, N. Y. It consists of a light blowpipe handle and a set of special tips to give flames suitable for a wide range of work. The outfit is most conveniently used with a small gas tank such as those standard for motorcycles or trucks and a 6-ft. length of hose. Small furnaces for heating lead, paraffin and the like can also be heated with the same outfit.

It is claimed that acetylene has advantages over other means of heating

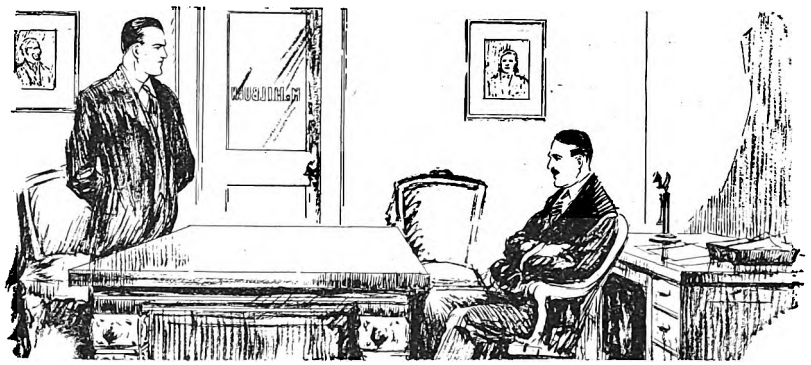
Using the blow pipe for soldering

for this class of work, as it produces a high flame temperature and the flame is non-oxidizing and non-carbonizing. No preheating is required and in operation it is necessary only to turn on the gas, light the torch and the job is under way. Soldering may be done either with one of the tips or the blowpipe may be converted into a soldering iron by slipping the soldering copper over the end of the blow torch tip and tightening a single set screw.

The outfit is particularly convenient for electric work on poles or underground in inaccessible places. Painters use it for burning off paint. New uses in the shop are being found constantly.

Dick Prescott Gets a Surprise

And a Promotion



ON THE appointed morning, following Mr. Milburn's inspection of the newly painted car in the Consolidated Railway & Light Company's shop, Dick Prescott, young assistant superintendent, reported at the general manager's office.

When Dick was ushered in, he found Mr. Milburn in no hurry to get into the subject of their conference.

"How long have you been with the company, Dick?" suddenly asked Mr. Milburn.

"Just about four years."

"That's right, I remember now, you joined the company just a few weeks before I came on the property.

"Yes, sir, and I think the company has been making some real progress during that period."

"Tom Mullaney speaks very highly of you, Dick, and gives you credit for much of the progress that has been made in the shop."

"He's very considerate, Mr. Milburn, for after all Mr. Mullaney has backed up my work and has carried the responsibility for the success of any suggestions I may have made."

"You're not afraid of responsibility yourself, are you Dick?"

"No, sir, I don't think I am. Fortunately, I've had the co-operation of all the foremen in the shop. We thrash things out pretty thoroughly before making any important change in practice, and when we decide to go ahead, I'm pretty sure of my ground."

"Fine, Dick! That kills two birds with one stone; it wins you the co-operation of your foremen and at the same time enables you to check your own judgment with their experience. That's my idea of developing team work in an organization."

"I believe, Mr. Milburn, that this business of ours requires a lot of team work all the way up and down the line.

"Right again, Dick. I've noticed that you seem to have sensed the thrill that comes from this game of rendering transportation service to the public, and that you have succeeded in transmitting your own spirit to those around you."

"Thank you, Mr. Milburn."

"That isn't all, Dick. I've got some real news for you. Tom Mullaney is going to retire. He hasn't been very well lately and so he's going to move out to that farm of his. I have therefore decided to make you superintendent of equipment in full charge of the department, effective immediately. That was Mullaney's suggestion as well as my own idea."

This momentous news came as a complete surprise to Dick. There flashed through his mind the memory of his keen disappointment at having to leave college and of his humiliation upon being forced by necessity to seek an humble job in the Consolidated shop. For a moment he was overwhelmed by his feelings and struggled valiantly to recover himself.

"Gee! Mr. Milburn," he finally managed to stammer. "I—I hardly know what to say."

"Don't say a thing, Dick. Your record speaks for itself. You have earned the promotion by your spirit and your work. I have great confidence in your ability to carry this increased responsibility with credit to yourself and the company."

The general manager chatted cordially for awhile, outlining some of his hopes for the property. He suggested that Dick take a few days to adjust himself to the new conditions before endeavoring to discuss the work of his department.

As Dick started back toward the shop he could scarcely believe that it was all true and that he was actually to be in charge of the equipment department. After he had boarded a car and settled down in his seat, his mind reverted again to his early days in the Consolidated shop. Thoughts crowded in upon him until he was hardly conscious of his surroundings. Thus deep in reverie, he suddenly realized that he had reached his destination.

"Gee!" thought Dick as he arose to alight; "I wonder what the gang will think about this when they get the news."

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Association Activities

Maintenance vs. Repairs*

By Gus C. Kraus
Assistant to Superintendent of Rolling Stock and Shops, New Orleans Public Service, Inc.

SUCCESS attained with any program for keeping cars in serviceable condition depends almost entirely on the organization that is behind it. Our organization in New Orleans is divided into three departments—practical, engineering and statistical. The assistant to the superintendent is the head of the practical department, and is in charge of all shops and carhouses. He is responsible for all work done on the cars. The equipment engineer is responsible for all engineering work. The chief clerk is responsible for the keeping of all mileage, material and cost data. These three heads report directly to the superintendent of rolling stock and shops.

The overhauling of all equipment is done at our Carrollton shops, where cars are received after completing 40,000 car-miles of service, or on an average of once every twelve months. From mileage reports of the statistical department, cars are sent to this shop by orders from the office of the superintendent of rolling stock and shops.

Briefly, overhauling consists of removing motors, line breakers, circuit breakers and air compressors from the car; replacing them with tested units that have previously been placed in as near their new condition as possible. At the same time, trucks, brake rigging, air piping, door mechanism, controllers, car wiring and minor units (such as trolley poles, harps and wheels) are carefully checked and overhauled as required, so that they may safely give 40,000 more car-miles of service without the threat of an equipment failure.

All overhauling, with the exception of armatures, is done under the supervision of the shop foreman, but overhauled units must be tested by the shop engineer and have his o.k. before they may be placed on a car. This engineer also has charge of all armature work, since this work requires almost continuous electrical testing. Electrical tests, such as resistance measurements, high-potential tests, motor running-in and load tests, etc., are made by the engineer, or under his direction. A detailed outline of motor overhauling and testing procedure used in New Orleans appears at the end of this paper.

We do not permit any "jumping" or "cutting-out" of armature coils. It has been our experience that due to the localized heating which is set up, a cut-out coil will cause flat spots on commutators, weak brush-holder springs, rapid brush wear, commutator flashing and undue destruction of coil insulation. Furthermore, the rating of the motor with jumped armature coils is necessarily changed.

The overhauling and painting of car bodies is done at our Magazine shops. Cars are received there on an average of once every eighteen months, the work done depending entirely upon the condition of the car. For example, paint work may be either a "cut-in" job or the old paint may be burned off completely and the surface brought up new. The latter process requires about fourteen days. Cars have their paint burned off on an average of once every nine years.

In addition to overhauling and painting car bodies, the only other work done at the Magazine shops is maintenance work for the car stations. This consists of boring and fitting wheels, repairing doors and sash frames, and such forging and machine work as may be required between the 40,000-mile overhauls.

No Parts Are Made in Shops

Every effort has been made to eliminate manufacturing of any kind, since we feel that without a fully equipped laboratory and the services of a metallurgist we could not compete with those manufacturers who continually improve the quality of their products by experiment and research. Toward this end, we have closed our foundry and have noted a saving of between $9,000 and $10,000 per year in the cost of car material. Our present outlay for all castings, brasses, brakeshoes, etc., is 80.3 cents per 1,000 car-miles. This cost is based on the material used during the twelve-months period ending Oct. 31, 1927, which amounted to $11,395,98. The total mileage during this same period was 14,188,380.

Reducing manufacturing activity in a railway shop saves valuable floor space and makes it available for maintenance work. For example, with our shops becoming more and more cramped for room, we contemplated the erection of new shops, at an estimated cost of $1,500,000. The yearly fixed charges, including interest, depreciation, taxes, etc., which amount to 15 per cent of the above, sum, would total $225,000. This is within $60,000 of the total maintenance cost on our cars. Now, at a cost of only $20,000 we have changed over our present shops into better-arranged, better-lighted and better-ventilated shops that afford us sufficient room for our present needs after manufacturing work had been eliminated. We have provided a complete equipment of modern tools and the proposed new shops have been placed in the 1932 budget.

The amount of work done at the car station in New Orleans has been reduced to a minimum. For example, in case of a motor failure, the motor is not removed at the station. Instead, the car is sent to the overhauling shop for an exchange of motor equipment. In this way the car can be completely checked to study the cause of the failure and prevent recurrence. The principal work at the car stations consists of making a regular 1,000-mile car inspection. Brakeshoes and wheels are changed as required, and all stations are provided with wheel grinders for grinding both new and old wheels.

It is the aim of our organization to standardize equipment to the greatest extent possible. Changes in standardization can be made only by an order of the superintendent, which is issued after an agreement has been reached by department heads. A continuous check is being made of material that is out of date and may be obsolete. Old tools are scrapped when it can be shown that new equipment can do the work better, and at the same time earn the interest on the necessary investment. New tools and equipment are being devised continually to facilitate overhauling work. Experimental material is placed on test and records are carefully kept to find how serviceable this material proves to be.

Department head meetings are held once a week in the superintendent's office, at which routine matters are handled. A meeting of department heads, station and shop foremen and engineers is held once a month. At this meeting the organization is furnished with detailed costs for each station and shop.

In order to provide for the training of its men along lines which will be helpful to them in their work, the company has created an educational department, which conducts night classes in practical electricity, shop arithmetic and accounting. In the practical electricity class a particular effort is made to tie in theory with actual street railway operation.

Our practice is based on the principle that proper overhaul of cars at definite periods reduces maintenance costs to a minimum. This reduction in costs

**Abstract of a paper presented at the meeting of the Electric Railway Association of Equipment Men, Southern Properties New Orleans, La., Jan. 25-27, 1928.*

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is secured by the elimination of repairs between overhauls. At the same time the value of having cars in such condition that they will operate without a failure is worth more than the money saved through the elimination of these failures, since it secures the good will of the public.

Method of Overhauling and Testing Railway Motors

Railway motors are overhauled on a 40,000-mile basis. This overhauling is done at the Carrollton shops, under the personal supervision of the shop foreman and the engineer in charge of tests.

After 40,000 miles of service each car is sent to the Carrollton shops for overhaul. No motors are removed from cars at any time at any of the five carhouses. When the car is received at the shops the trucks are run out from under the car body, the motors removed from the trucks and the armature is removed from each motor.

In regard to the armatures, the term "dipped and baked" refers only to armatures out of overhauled motors. The armatures out of motors which fail in service are known as "rewound" armatures.

If dipping and baking is all that is required for an armature, the procedure is as follows:

1. A "bar-to-bar" test is given to determine if there are any loose connections, open circuited coils, or short circuited bars.
2. A high-potential test of 1,300 volts (at a frequency of 60 cycles) is made for one minute to determine if there are any grounded bars or coils.
3. Core and end bands are removed.
4. Dressings on both ends of the armature are removed.
5. All low coils have fillers placed on top of them in order to get pressure on top of the coil when the armature is rebanded.
6. Core bands are replaced.
7. The armature is preheated at least four hours at an oven temperature between 220-225 deg. F.
8. The armature is dipped, remaining in the dipping varnish a sufficient time to allow the varnish to fill all crevices so that air bubbles cease rising to the surface of the varnish. Specific gravity of the varnish is maintained between 0.835 and 0.845.
9. The armature is returned to the baking oven and remains there for 36 hours. The oven temperature is maintained between 200-225 deg. F.
10. The armature is redressed.
11. End bands are replaced.
12. The commutator is turned, taking the lightest possible cut across its face, and then polished with No. 00 sand paper.
13. The commutator is slotted, if necessary.
14. A second bar-to-bar test is given the armature to check up, as in item 1.
15. A second high-potential test of 1,300 volts for one minute is given the armature.
16. Armature bearings are properly fitted to the shaft.
17. The armature is returned to the motor assembly floor to be replaced in an overhauled frame.

Rewound armatures are handled as follows:

1. Armatures are stripped of old coils, core slots are cleaned and commutator necks are prepared for new coils.
2. The armature is rewound.
3. The armature is preheated in oven at least fifteen hours at a temperature ranging between 220-225 deg. F.
4. Temporary bands are placed on armature.
5. The armature is dipped in the manner previously described.
6. The armature is returned to the oven and baked for 48 hours at a temperature ranging between 220-225 deg. F.
7. Temporary bands are removed from the armature, fillers are placed on top of low coils, the armature is redressed and then banded.
8. The commutator is turned up.
9. The commutator is slotted, if necessary.
10. A bar-to-bar test is made.
11. A high-potential test of 1,800 volts for one minute is given the armature.
12. Armature bearings are properly fitted to the shaft.
13. The armature is returned to the motor assembly floor to be replaced in an overhauled frame.

After an armature is removed from the motor frame the latter is thoroughly cleaned of all dirt or other foreign material. The fields are then tested as follows: (1) A "hammer" test is made to determine if the insulation is apparently in good physical condition, and if any of the coils are loose in the shell; (2) the resistance of the field coils is measured to see if it checks with the standard; (3) a high-potential test of 1,750 volts for one minute is given to determine if the coils show sufficient insulation strength; (4) polarity of any new fields which may be used is checked.

The following general work is done on motor shells: (1) The interior of the motor shell is sprayed with air-drying insulating varnish; (2) the motor leads are carefully examined and defective leads are replaced. All motor leads are then treated with a flexible insulating paint; (3) brush-holders are removed, put in first-class condition and replaced; (4) armature bearings are pressed into end housings.

After complete overhauling, the motor armature and frame are reassembled. The resistance of the motor armature is then secured, and the brush pressure checked. A running-in bearing test is then given the assembled motor by operating the motor at no load for at least fifteen minutes to see if any hot bearings develop.

The load test is the last test given a motor before it is replaced under the car. This load test has only been given recently, and is used on only a certain proportion of the overhauled motors. The present load test practice is to operate the motor under 150 per cent of its hourly rating for 7½ minutes in each direction of rotation.

COMING MEETINGS OF *Electric Railway and Allied Associations*

March 2 — **Metropolitan Section, American Electric Railway Association, Engineering Societies Building, New York, N. Y.**

March 13-15 — **Oklahoma Utilities Association, annual convention, Tulsa, Okla.**

March 14-15 — **Illinois Electric Railway Association, Springfield, Ill.**

March 21-22 — **Central Electric Traffic Association, Seelbach Hotel, Louisville, Ky.**

March 23 — **Maryland Utilities Association, annual meeting, Emerson Hotel, Baltimore, Md.**

March 30 — **Executive Committee American Electric Railway Association, 292 Madison Avenue, New York, N. Y.**

May 2-5 — **Southwestern Public Service Association, Dallas, Texas.**

May 6-12 — **Union Internationale de Tramways, de Chemins de Fer d'Interet Local et de Transports Publics Automobiles, biennial meeting, Rome, Italy.**

June 6-8 — **Canadian Electric Railway Association, annual convention and exhibits, Toronto, Canada.**

June 20-27 — **American Railway Association, Div. 5—Mechanical (including former activities of the Master Car Builders' Association and the American Railway Master Mechanics' Association), annual convention and exhibit, Atlantic City, N. J.**

June 21-22 — **American Railway Association, Motor Transport Division, Atlantic City, N. J.**

June 28-29 — **Central Electric Railway Association, Cedar Point, Ohio.**

July 8-12 — **Public Utilities Advertising Association and International Advertising Exposition. Detroit, Mich.**

July 25-27 — **Electric Railway Association of Equipment Men, Southern Properties, Cincinnati, Ohio.**

SEPT. 22-28, 1928

American Electric Railway Association, 47th annual convention and exhibit, Cleveland, Ohio.

New Officers for Wisconsin Motor Association

NEW officers were elected at the annual meeting of the Wisconsin Motor Coach Association held in Milwaukee on Jan. 20. These will hold office during the present year.

President, H. G. Monger, Milwaukee Electric Railway & Light Company, Milwaukee; vice-president, F. L. Neilson, La Crosse & Southeastern Transportation Company, La Crosse; treasurer, M. H. Frank, Wisconsin Power & Light Company, Fond du Lac.

Executive committee: Above officers and A. M. Schrum, Gray Transportation Company, Milwaukee; W. J. Kay, Northland Transportation Company, Minneapolis; B. W. Arnold, Chicago, North Shore & Milwaukee Railroad, Milwaukee; and N. C. Rasmussen, Wisconsin Valley Electric Company, Wausau.

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Illinois Utilities Announce Joint Meeting

ON MARCH 14 and 15, the Illinois Electric Railways Association will hold a joint meeting with the Illinois State Electric Association and the Illinois Gas Association in Springfield, Ill. The program will be announced later.

Southwestern Transportation Men Meet

PUBLIC relations, traffic regulation, traffic congestion, de luxe equipment as a means of increasing rides, and the increase of car speed as a means of obtaining increased passengers, were the principal subjects discussed at a meeting of the transportation and public relations division, railway section, Southwestern Public Service Association, at the meeting held in Fort Worth, Tex., early this month. The meeting was conducted by L. E. Thorn, chairman of the transportation division, and A. B. Paterson, chairman of the railway section, together with Secretary E. N. Willis of the association. The attendance was good. Companies from San Antonio, Fort Worth, Dallas, Houston, Waco, Shreveport and New Orleans were represented.

The next meeting of the association will be held in Dallas, Tex., May 2-5.

Publicity Representative Proposed for C.E.R.A.

EMPLOYMENT of a joint representative for the purpose of delivering addresses before the various clubs and civic organizations, chambers of commerce, etc., in the territory served by the Central Electric Railway Association, was proposed by the publicity committee at the Cincinnati meeting. It was also proposed that such representative deliver similar talks in territories outside the immediate association territory, such as the Southern states to which new joint through-rates have been established.

Secretary L. E. Earlywine has addressed a circular letter to the members of the C.E.R.A. requesting their views on the desirability of the plan and whether they will subscribe to the expense of employing such a representative.

New Central Association Groups Proposed

MEMBERS of the Central Electric Railway Association have been sent a circular letter by President W. S. Rodger relative to the proposal made at the annual meeting held in Cincinnati to the effect that two new associations be formed. These, which would be similar to the Traffic Association and the Master Mechanics Association, would handle the work of the power distribution and track and roadway committees, which were authorized last year following the summer meeting.

The executive committee, to which the matter was referred for disposal, decided to solicit the views of the member companies regarding the advisability of organizing these two subsidiary associations. It was the feeling of the members of the executive committee that the same necessity does not prevail for associations to handle power and roadway questions that exist in connection with matters being handled by the present subsidiary associations, as neither track nor overhead power equipment is interchangeable between the railways. The executive committee is asking members to give their views on the subject.

American Association News

Standing Committee on Power Assembles

SPECIAL committee chairmen of the power division met at Cincinnati on Jan. 25, to report the work of their respective committees. Reports were made for all committees except numbers 3 and 13.

D. L. Smith, chairman special committee No. 5, proposed a division of the catenary specifications into light and heavy construction, and further, a segregation of materials for direct suspension, light catenary and heavy catenary construction, as a basis for this year's work of his committee. H. S. Murphy reported for committee No. 6 that the main line mileage will be separated this year from the yard and siding mileage in the tabulation of data on trolley wire wear. Also, that statistics will be prepared on a basis of 100,000 or 1,000,000 car-miles.

The preliminary report of committee No. 2 was read by H. W. Codding, on the subject of mercury arc rectifiers. All sections of the report except one were approved by the standing committee. John Leisenring reported that committee No. 11 was uncertain of the purpose of its assignment. A discussion of overhead versus underground distribution cables followed. It was generally agreed that for the purpose of comparison the committee should undertake to obtain data on initial costs of installation including fixed charges, maintenance costs and maintenance problems; also, the reliability and length of life of the two types of construction.

J. W. Allen, reporting for committee No. 1, stated that eighteen of the 30 sections of the Manual to be checked, had been reviewed and that few changes had been made. J. F. Neild submitted a statement of the activities of committee No. 8 and a drawing showing a proposed series of standard reels. W. J. Quinn reported for committee No. 7 that there had been no recent activities of the American committee on inductive coordination. He stated also that sufficient information on radio interference was available to warrant its assemblage in one report.

Manufacturers' representatives, according to C. E. Bennett of committee No. 4, are preparing a preliminary report outlining the advantages and disadvantages of the segregation of control apparatus and power apparatus. Mr. Bennett reported also for committee No. 10 and stated that various schemes for protecting both line and cars have been discussed. The committee decided that it was preferable to ground the arresters to the rail rather than to install separate ground rods; and also, that the committee was not in favor of connecting rails and ground rods together. A general discussion developed with differences of opinion among the members present as to the proper method of grounding lightning arresters.

Committee No. 9, represented by A. J. Klatte, was requested to compare the conduit specifications in the Manual with those of the American Railway Association. It was also suggested that manufacturer members be asked to offer their suggestions as to desirable revisions. H. S. Murphy reported that his committee, No. 12, was gathering data on the use of non-ferrous materials for overhead construction on electrified railroads.

H. E. Bachman was appointed the Association's representative on technical committees 5 and 10 of the A.E.S.C. sectional committee on insulated wires and cable, to replace M. B. Rosevear, who resigned.

Those present at the meeting were W. E. Bryan, chairman; C. E. Bennett, C. A. Butcher, A. J. Klatte, A. Schlessinger, L. W. Birch, John Leisenring, J. F. Neild, W. J. Quinn, D. L. Smith, H. W. Codding, H. S. Murphy, C. S. Anderson, representing W. H. Bassett; J. W. Allen, and G. C. Hecker. H. L. Swift, Cincinnati Street Railway and J. C. Bailey, Columbia Engineering & Management Corporation were guests.

A.E.R.A. Joins in Better Copy Contest

THREE great national utility associations have now joined the Public Utilities Advertising Association in conducting the Better Copy Contest. The entry of the American Electric Railway Association followed the entry of the National Electric Light Association and the American Gas Association.

The electric railway group will act jointly with the Advertising Association in the competition which covers the electric railway and bus transportation fields. The three awards for the best public utility advertisement in this group will be presented under the auspices of the A.E.R.A. in conjunction with a joint committee of judges representing both sides. The contest in this division is open to all public utility operating companies providing electric railway or bus transportation service.

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News of the Industry

Prospects Dim for Legislation

Committees entrusted with shaping future policy of state toward Boston Elevated agree to disagree

IT IS beginning to look on Beacon Hill as if the Massachusetts Legislature again would get into such a hopeless tangle over the Boston Elevated situation that it will be unable to extricate itself during the pending session. Its two committees, the metropolitan affairs and the street railway committees, which are handling the matter, are torn by internal dissentions over developments. The vote to reject a motion to invite the Boston Elevated directors to appear and offer some plan for the future in the interest of the stockholders is regarded as a blunder. They have voted to hear counsel Frederick E. Snow, in executive session instead. Some of the minority members of the committees are so bitter over this move that they declare they will bolt the executive session if Mr. Snow appears to discuss the Elevated behind closed doors.

The Voice of the Stockholder Should Be Heard

The move to invite the directors was made by Representative Eliot Wadsworth, who is opposed to the Harriman plan for the extension of public control. He argues that thus far Elevated stockholders have declined to accept plans put forth by the Legislature. Since it has been reported to the committees that the Elevated directors will advise the stockholders to reject the Harriman plan now pending, Mr. Wadsworth says the time has arrived for a reversal of that policy. Stockholders should be permitted to advance plans to which the Legislature may say "yes" or "no."

The trend of the discussion mostly concerns the return of the property to the owners, and the extreme opposite—purchase by the Commonwealth and public ownership. Prof. Philip Cabot of Harvard University, advocated return of the property to the owners. James F. Jackson, former chairman of the Elevated Board of Public Trustees, recommended adherence in the main to the Harriman plan for extending public control for fifteen years. Frank A. Goodwin, registrar of motor vehicles, is urging state ownership and Representative Martin Hays would turn the property back to the stockholders. Public sentiment is swayed and changing. Hardly two leaders who appear in public seem to think alike on the subject today. The most likely eventuality is that the lawmakers will not pass any legislation favored by Governor Fuller.

A line of attack is being laid intended to show that so many legislators own Boston Elevated stock in their own rights, or are related to people who own such stock, that many of them would be disqualified from voting on any Boston Elevated legislation this year. It is not understood that the law forbids voting under such circumstances, but there are rules and precedents to cite against it.

Joseph B. Eastman of the Interstate Commerce Commission has agreed to address the committees on Feb. 23 on the situation.

Safety Record in Kansas City

In all 437 employees of the Kansas City Public Service Company, Kansas City, Mo., finished the year 1927 with clear accident records. The company is now driving for a similar record for the current year. Names and individual records were published in the February issue of the *Railwayan*, the official paper of the company.

Nine-Cent Fare in Baltimore

Service supplied by United Railways declared indispensable. Many improvements to be effected. Commission denounces park tax. Reorganization of financial structure desirable

AN INCREASE in fare from 8 cents cash or two tokens for 15 cents to 9 cents cash or three tokens for 25 cents has been granted the United Railways & Electric Company, Baltimore, by the Maryland Public Service Commission. At the same time the children's fare rate was increased from 4 cents to 5 cents. No change was made in school commutation or other rates. By the same order the company is to extend the first fare zone on the Halethorpe line to the terminus of the line, making one fare to and from that place instead of two. The change in fare rates became effective at midnight Feb. 12. Whether the rate will be accepted by the United has not been determined and will not be decided upon until officials hold a series of conferences with their legal representatives. The company's application was for a flat 10-cent rate. In handing down the decision the Public Service Commission said officially that with the increased rate it would expect the company to improve its service forthwith, to decrease the headway between the cars and to effect as rapidly as possible other improvements necessary for proper service to the public.

The position of the commission in the matter was set down as follows:

So long as the company is performing a necessary service it is entitled to be compensated for that service by an amount which will cover its costs, and will yield a fair profit on the use of its property, and this commission will authorize the company to collect a rate which will yield that cost and profit, so long as it is reasonable and no more than the commission feels the service is worth to the public. But the company cannot depend upon regulation and increasing rates to save it from ultimate disaster, if, because of the automobile, or any other new agency of transportation, its service becomes obsolete, and the use of that service is confined to comparatively few people. The company has been protected from jitney competition and its rates have heretofore been raised to meet increasing costs of rendering service, but there is a limit beyond which the commission cannot go in permitting higher rates to meet, not increasing costs of doing business, but failure to earn a sufficient return, due to the falling off of business.

In a lengthy opinion handed down with the order, the commission set forth an estimated return for 1928 under the new fare rate, allowing for a 2 per cent falling off in full fares. The rate of return was given as 6.26 per cent.

The commission recently reduced the value of the United's easements from $7,000,000 to $5,000,000, bringing the value of the company's property to $75,000,000, and it was this last-named figure that was used as the base for calculating the return.

It was said by the commission that it believed the falling off in riding was due, not to the amount of the fare, but in part to the slump in business and in still larger part to the more general use of automobiles. This automobile competition, the commission said, promised to be greater this year than it was last. "Much has been said about the loss of the short rider and this is often attributed to the price of the car ride," said the commission. "This may be true in some cases, but it does not appear to be so with a great many. To the extent that the short rider has been lost, this loss is due, it seems to the commission, not so much to the cost of the ride but to the length of time the ride itself takes. This is due to the congestion in the streets, caused by the automobile which not only cuts into the revenues of the company but slows up the operation of the street cars, so that an ordinarily vigorous person frequently can walk through the congested business section in less time than he can make the journey on a street car. With automobiles parked on each side of a street all traffic is forced on the car tracks, slowing up the cars and making street car operation more costly, for the slower the cars run,

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the more expensive it is to operate them."

A controversy between Mayor William F. Broening and Harold S. West, chairman of the commission, was brought about by the commission's discussion of the park tax paid to the city by the United. The Mayor contended that the part of the opinion dealing with this subject was gratuitious criticism and difficult to understand. According to the opinion an element in the railway situation which resulted in higher fares was the park tax. It was purely and simply a tax on the street car riders for the support of the city parks. The company did not pay it. It was paid by the riders and the company simply acted as a collector, receiving approximately one-half cent on each fare the rider paid and turning the money over to the city quarterly. It was, perhaps, a tax on the company in former years, but now it was an expense which must be deducted before any rate of return is calculated. The result was that for the maintenance of parks, stadium, swimming pools, tennis courts, golf courses, baseball fields and park roads, maintained for automobilists, car riders have contributed since 1910, when the company was put under Public Service Commission regulation, the sum of $15,406,794. This, of course, is in addition to the general taxes and such special charges as those made for street paving and for maintaining the paving between the tracks and for two feet on each side.

The opinion stated that an arrangement might be made by which the city would consent to the passage of an act reducing the amount of the tax 1 per cent a year, which would gradually relieve the street car riders of this burden and wipe it out entirely in a period of nine years.

Significant in the opinion was the statement that the service rendered by the company was a necessary and vital thing to the people of Baltimore. This was indicated by the fact that the demand upon the system during morning and evening rush hours was almost greater than the company could meet. Time was when the service was used for pleasure. The motor car has largely taken the place of the street car for pleasure riding. The street cars are used only by those who find them necessary or convenient to get to and from places of employment, or for other trips about the city. It would be practically impossible for all the people who use the street cars to reach their places of business or employment, and return to their homes, by any other means of transportation now available. And if the service is necessary to them they cannot expect to be transported for less than the cost of transporting them, plus a fair return for the use of the agency of transportation. Even at somewhat increased cost it still would be the *cheapest* form of transportation the people could get.

That the extension of the railway system into the suburbs has resulted in the development of the sections which the lines serve is beyond question. Even in these days of almost universal use of the automobile, property values, except perhaps in that part of the city as it existed prior to the annexation of 1888, are dependent largely upon street railway transportation. Withdrawal or material curtailment of service would be felt immediately in the lowering of real estate values, for there is no transportation agency which would give so comprehensive a service at such low cost.

Moreover, the development of property and the creation of higher values along the outlying lines of the company often have been largely at the *expense* of the company. While creating increased values in land by the extension of its lines and service, thus benefiting immediately the property owner (and the city and county by increasing the taxable basis), the company has no way of sharing in the increased values it creates until the time comes when there is sufficient development in new territory to produce enough traffic to make the operation of the lines compensatory. Until that time is reached, the company is compelled to give service to new territory at a loss.

One reason for the company's plight today the commission believed was the fact that following annexation in 1918, the city zones on the street car system were extended to the new city line, this line for nearly the entire distance around the city having been extended about two miles. Annexation, while a desirable thing for the city, did not benefit the railways. It imposed additional obligations upon it, and when extensions of fare zones were made it caused extensive loss of revenue which had to be made up through rate increases. In fact, taking all things into consideration including auxiliary bus lines and the like, the commission believed that car riders as a whole today received relatively much more for the fare they paid than they ever received for a 5-cent fare.

In the opinion of the commission Counsel Toole's theory that the company should be forced into a receivership where a proper reorganization could be effected would mean no good but much harm to the car rider and the whole community.

The commission does not believe that the company's credit can be permanently bolstered up or maintained by the payment of dividends as long as its financial set up remains as at present. It says the structure is top heavy. There are too many bonds outstanding in proportion to the stock. The stockholders have too small an equity in the property. Including its notes, the company has outstanding $67,176,200 in securities representing funded debt and $20,461,200 in stock. Not only is the par value of these securities $12,637,400 in excess of the value of the property as fixed by the commission, but the ratio of funded debt to total capitalization is approximately 76 per cent. The ratio of funded debt to value of the property found by the commission is approximately 90 per cent. The commission believes that the ratio of debt to stock ought not to be greater in a company of this sort than 67 to 33, and does not believe its credit can be permanently established and maintained until approximately this ratio is created. It is of the opinion that the par value of the securities ought not to exceed the value of the property as found by the commission, and, for safety, should be even less than the value found. The commission says:

> It must be remembered that the value of this property was established largely on present-day costs, which had increased very much in the years immediately preceding the valuation. The time may come when reduced costs of reproduction may necessitate a lower valuation, in which event, if the par value of securities is now scaled down only to the commission value, the company again may find itself in the position it now is in; that is, with securities outstanding exceeding in par value the then value of the property.

According to the commission there

ESTIMATE OF RESULT UNDER NEW RATES IN BALTIMORE

		Number of Passengers		Revenues
Cash Fare	@ 9 cents	7,180,730		$646,226
Token Fare	8⅓ cents	191,753,540		15,979,461
Total full fares		198,934,270		$16,625,727
First county zone	@ 4½ cents	2,600,000		117,000
Second county zone	5 cents	270,000		13,500
Third county zone	5 cents	45,000		2,250
Bethlehem steel tickets	5 cents	1,600,000		80,000
Miscellaneous		8,000		400
Half fares	5 cents	8,080,000		404,000
School	5 cents	3,860,000		193,000
Total		215,397,270		$17,435,877
Other revenue				235,000
Total operating revenue				$17,670,877
Operating expenses			$10,303,944	
Depreciation			883,544	
Taxes				
Property			487,110	
Park tax			1,168,204	
Income tax			138,469	12,981,271
Operating income				$4,689,606
Non-operating income				171,000
Gross income				$4,860,606
Deductions from gross income				3,445,000
Net income				$1,415,606
Amount available for return				$4,731,606
Per cent of return on base of $75,000,000.00, per cent				6.31
Deduct $40,000 from gross revenues for Halethorpe zone extension, giving a rate of return of, per cent				6.26

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are other defects in the company's financial structure in addition to the disproportionate ratio of bonds to stock. It is admitted that under present conditions the company cannot sell junior securities, such as preferred and common stock, to obtain money for capital expenditures. Nor can it issue bonds on the property of The United Railways & Electric Company of Baltimore in order to secure new capital, because the company has a closed mortgage and any new property obtained is immediately covered by that mortgage. For such new capital as it may obtain and for which it must issue bonds it must adopt the expedient of issuing these bonds in the name of a subsidiary, The Maryland Electric Railways, procuring property with that money, and then leasing the property to the United for a sufficient sum to pay the interest on the bonds and provide for their retirement at maturity. The commission says:

A reorganization of the financial structure of the company would naturally result in the substitution of a more flexible mortgage for the old closed mortgage. This would enable the company to provide for its capital requirements by the issuance of new securities as new property is required, on the basis, perhaps, of 67 per cent of bonds and 33 per cent of stock.

While the commission recognizes it has not the authority to order any such reorganization as is here outlined, it trusts that the company will take the problem under earnest consideration and work out a plan of financial reorganization that will help solve its difficulties concerning credits. The commission said:

In every rate hearing in which an increase has been asked, emphasis has been laid upon the importance of establishing a rate which would sustain the company's credit, and which would enable it to borrow money for its capital expenditures at lower rates. Recently emphasis has been laid upon the paying of dividends in order to maintain credit, and increase the borrowing capacity of the company. The commission did not believe credit was helped by paying dividends out of surplus when they have not been earned, and by distributing the money held in the surplus account to the stockholders, from which it cannot be recovered, rather than retaining it in the surplus account where it is, at least, an actual, tangible basis for credit. The commission has no comment to make upon the statement that money in the surplus account actually belongs to the stockholders, and that it is the right of the stockholders to have it paid to them in dividends. So does the surplus actually paid in by the stockholders of a bank belong to such security holders, but it is not paid back to them in dividends, particularly when earnings are low, as a means of maintaining the bank's credit.

In any rate of fare allowed, out of which dividends may be paid, it is not allowing that amount for the payment of dividends for the sake of maintaining the company's credit, but because the company is entitled to that amount of surplus as a matter of right; and the company, in the exercise of its own discretion can pay it out in dividends or retain it in its surplus account.

Of the value on which the return is computed the commission said:

In Case No. 533, decided on Feb. 1, 1928, the commission fixed the value of the company's property at $75,000,000 as of Dec. 31, 1923, of which sum $5,000,000 was for easements. The company claimed that, subsequent to the date of the valuation, net additions had been made which would add $1,005,270 to the above value. People's counsel, questioning the amount of increased valued claimed by the company, attacked the bookkeeping methods of accounting for additions where old trackwork is replaced and declared that the $1,005,270 should be nearer $200,000. His witnesses also pointed out that a decrease in construction costs had taken place between 1923 and 1927 and that this factor, if given the same weight as was given the cost of reproduction by the commission in fixing its value, would tend to indicate a decrease rather than an increase in the 1923 value. In considering all facts which to it seem relevant and particularly, as the relatively small amount in dispute might easily be offset by a slight fluctuation in price levels, the commission is of the opinion that the proper value to be used, at the present time, as a test of the reasonableness of the rates to be fixed in this proceeding, is $75,000,000.

The new fare rate created chaos for the first two days it was in effect. Almost all the 2,500,000 tokens the company has, had been hoarded by the riders, who had purchased them for 7½ cents. It was expected that when the new rate became effective these would come back immediately. But they did not.

Almost all persons boarding the cars offered to buy tokens but the conductors were unable to supply them. Under the circumstances the Public Service Commission ordered that 8 cents be paid as the cash fare. But in many instances the conductors were unable to make change and the patrons in many cases paid fare of only 5 cents.

In order to meet the situation the United wired an order for an additional 1,000,000 tokens, to be supplied in lots of 100,000. But two days later the old tokens began to return to the company and there were few cases where conductors were unable to supply them. The entire situation is now becoming straightened out.

Weather Bureau in Gary Run by Railway

A new and unusual service to the public was recently started by the Gary Railways in the form of an official weather bureau for the city of Gary, Ind. Several weeks ago the company purchased a complete set of weather recording instruments in order to obtain accurate information in advance of storms, thus being able to muster its track forces in time to keep snow and ice from interferring with operations and incidentally to anticipate a considerable saving on storm-fighting equipment.

Conceiving the idea of making the information available to the public, the company made an agreement with the Gary *Post-Tribune*, the local daily newspaper, to furnish local temperature and barometer readings each day on the front page of the paper in a "weather column." The name of the company appears in a credit line at the top of the column.

Paving Exemption Included in East St. Louis Franchise

A petition presented to the East St. Louis, Ill., City Council on Feb. 7 by the East St. Louis & Suburban Railway asking for a twenty-year franchise for its State Street line contained a clause exempting the company from paving between the tracks from 20th to 21st Streets. The company also asked that the franchise be transferred to the East St. Louis Railway. This follows the plan for the construction of a reinforced concrete viaduct to carry the terminal railroad belt line tracks over State Street. The steam railroad would pay for the viaduct, the city for depressing the street and the electric railway would defray cost of relaying its tracks. The main carhouse of the East St. Louis & Suburban Railway is near by and the cost to that company would be about $60,000. If the City Council passes the new franchise it will be submitted to a vote of the citizens.

More Moves to Restore Service in Columbia

Several legal moves have been made in the transportation muddle in Columbia, S. C., within the past few days, but no street cars have moved, nor buses, and, except for the unregulated 10-cent jitney, the city is without any system of public transportation. The street cars, operated by the Columbia Railway Gas & Electric Company, were withdrawn in March, 1927, and the buses were in operation until midnight, Dec. 31, 1927, when they too were withdrawn, leaving the field entirely to the jitneys.

The Columbia City Council passed an ordinance directing the Broad River Power Company—the concern which furnishes power, light and gas to the city—to operate the cars. The Broad River Power Company disclaimed any responsibility in the matter and the Columbia Railway Gas & Electric Company then went into bankruptcy. A federal judge granted a stay of all proceedings involving in any way the property of the Columbia Railway Gas & Electric Company, which owns the lines, rails and equipment. Attorneys for the state and city have filed a petition to have the bankruptcy order vacated. Arguments on this matter will be heard in March.

Meanwhile a bill has been introduced in the General Assembly, now in session, to give the Columbia City Council full control over the city streets—a bill which, it is believed, will drive the jitneys off the principal streets. The jitney union wants the bill killed. Labor leaders contend that no public transportation system can be successful unless it has the support of labor. They want union men put in charge of buses or street cars or whatever may be put on the streets.

And so the people look to the jitney, at present, for transportation.

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Chicago Rapid Transit Petitions for 10-Cent Fare

Evidence bearing on the application filed by the Chicago Rapid Transit Company for an increase in fare to a flat 10-cent rate was heard by the Illinois Commerce Commission in Chicago on Feb. 14. The company is asking for the abolition of the three-for-a-quarter tickets and the $1.25 weekly pass in Chicago, Oak Park, Forest Park, Cicero and Berwyn. The existing fares of 3 cents for children more than seven and under twelve and of 5 cents for school children under seventeen years as well as the 25-cent round trip rates to Evanston, Niles Center and Westchester will remain the same. The new cash fare of ten cents which would increase the company's gross revenue about $3,845,000 annually, will automatically become effective within 30 days unless the commission orders a public hearing on the reasonableness of the new rate.

Formal announcement of the application for a higher fare was made by vice-president Bernard J. Fallon, coincident with the issuance of the company's annual report to stockholders. The additional revenue is needed by the company Mr. Fallon said for the purpose of acquiring additional equipment, renewing present equipment, making necessary improvements and to provide a reasonable return on the capital investment of the company.

He maintained that although traffic had increased from 204,000,000 passengers in 1923 to 226,000,000 in 1927, the return on the appraised value had been only 3.5 per cent last year. In that period the company put more than $6,000,000 of new capital into the property.

The hourly wage increase of 1 cent which was granted elevated trainmen last month as a result of prolonged arbitration was also set forth by Mr. Fallon as an additional expense.

Commenting on the proposed fight to be waged by the city, David H. Jackson, chairman of the Illinois Commerce Commission, declared that the rate would not be allowed for at least 120 days in order to give interested parties time to make investigations. He added that there might be a second suspension of six months if the case were not concluded during the first four months.

Bon Voyage to Engineers!

A vacation in Europe, combined with the study of engineering and industrial problems under the direction of experts, is an attraction for this summer under the direction of Prof. N. C. Miller, director of University Extension Division, Rutgers University, State University of New Jersey and of the School of Foreign Travel, New York City. The tour is designed for factory and public utility executives, instructors and students in engineering colleges, and others interested in business, industrial and engineering problems, who wish to study these subjects and at the same time have the opportunity of seeing the various problems treated in Europe. The itinerary has been planned to give the widest contact possible to the leading industrial sections of England, Belgium, Germany and France. College credit can be gained in industrial engineering and mechanical engineering if desired.

The price is $570, which covers a period from July 14, the sailing date, to Aug. 24, when the tour is expected back in New York. Detailed information regarding the specific outlines of the courses and arrangements for University credits may be had by writing to N. C. Miller, Rutgers University, New Brunswick, N. J., or to School of Foreign Travel, Inc., 110 East 42d Street, New York City.

Interborough Case in Courts

State Supreme Court, at instance of city and Transit Commission, issues injunctions against fare increase as railway starts federal action

BOTH sides in the 5-cent fare controversy in New York City appealed to the courts on Feb. 14. In doing this the Interborough Rapid Transit Company, which has filed a new 7-cent schedule effective March 3, next, made good its threat to go to the federal courts for relief. The company sets forth that the 5-cent fare is in violation of the federal constitution in that it is confiscatory. It asked the court for a decree enjoining the city from enforcing the 5-cent fare provision.

City and Commission Make Move

The city and the New York Transit Commission, later in the day, went into the Supreme Court of the state and were granted three temporary injunctions, all returnable on Feb. 20, designed to prevent the Interborough from charging more than a 5-cent fare. The State Transit Commission, at a special meeting, rejected the Interborough's new 7-cent fare tariff and dismissed the application for the higher rate.

No injunction was asked by the Interborough because none was needed until such time as the new rate of fare becomes effective on March 3 and then, if the city seeks to restrain the company from putting the fare in effect, the Interborough will seek intervention of the federal court through an injunction. If granted this would permit exercising of the new rate schedule until such time as the equity of the situation, reasonableness of the fare and company's claim of confiscation under the 5-cent schedule, is settled by the federal court. If the injunction is granted the company, a procedure similar to that of the gas rate cases would apply. This would involve naming a master to hear testimony and report back to the court. Then, if the company proves its case before the master and the court approves the master's report a permanent injunction would follow. After this, if the city desired, it would appeal on up to the United States Supreme Court.

As to the effectiveness of the state court's injunctions, presuming they are made permanent after the Feb. 20 hearing, legal opinion is that this will be a matter for the federal court to decide, i.e., whether the state court's injunction is valid in view of the equity bill placed before the federal courts on the ground of the 5-cent rate being in violation of the federal constitution.

The injunction orders were issued in the Supreme Court of New York County by Supreme Court Justice Edward J. Glennon. Three suits are filed, one by the city asking the court to compel the Interborough Rapid Transit Company to observe the rights of the city under the dual contract and to enjoin the company from raising the present rate of fare. The second action, which covers approximately the same points, was filed by the Transit Commission in behalf of the city. The third action is a special action brought under the public service laws designed to prevent violations of the law when threatened.

The Interborough filed suit in the federal court against the Transit Commission and the city of New York in its fight to obtain a 7-cent fare. The company asks the federal court for a decree enjoining the city from enforcing the 5-cent fare provision of the dual contract on the ground it is confiscatory.

It asks similar decrees against the order of the Transit Commission providing for the lengthening of station platforms at the company's expense and directing the purchase of 432 new cars. A further decree is asked to prevent the city from moving to seize or operate the company's lines.

By this move the Interborough Rapid Transit Company is believed to have brought the entire mass of transit litigation into the jurisdiction of the federal courts. The normal procedure will be for a motion date to be set on which the court will hear argument on the motion of the company for a temporary restraining order.

Senator Philip M. Kleinfield has introduced a bill at Albany providing for a transit authority to take over and operate existing rapid transit lines and build new ones. It would have power to issue bonds for construction of new transit facilities, and the only restriction placed upon it requires that a fare not to exceed 5 cents could be charged. No jurisdiction over existing transportation facilities or those under construction is given the proposed organization, but it would have control over future facilities.

Hearing in Ottawa Set

Hearing on the petition of the Ottawa Electric Railway, Ottawa, Ont., for an 8-cent fare or seven tickets for 50 cents will be held before the Board of Railway Commissioners on March 21. The case for the city of Ottawa, which is opposing the application, will be presented later. The present fare is 5 cents.

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For Distribution on Rochester Cars

The *Trolley Riders' News,* a tiny newspaper issued bi-weekly by the New York State Railways, Rochester lines, made its appearance on the street cars of Rochester on Feb. 1. The aims of the new publication, which is along the lines of similar organs in other large cities, are told in the following paragraph in the initial issue:

This is the first number of a new publication dedicated to our trolley patrons in Rochester. In addition to being published in the interest of public safety, it will bring before you interesting news of the trolley world and acquaint you with important facts about the street car.

Leon R. Brown, safety director of the railways in Rochester, is editor of the new sheet. Mr. Brown is also editor of the railways' house organ, *Transportation.*

A Challenge to Stone & Webster Employees

A design and slogan are wanted by Stone & Webster, Inc., which with appropriate wording might be used as a standard trademark for advertising purposes.

Its letter runs in part as follows:

The wording used in our present advertising is "Design, Build, Operate, Finance." Perhaps some one can suggest something else. It must consist of very few words, must be in keeping with best traditions of an organization of our size, and should tell a big story in a brief, forceful manner.

It is probable that this want can be supplied by the members of our own family and suggestions from everybody will be welcomed.

Action on Chicago Bills Awaited

Drafts of legislative bills providing for the consolidation of the traction companies of Chicago and the establishment of the terminable permit now pending before the Chicago City Council local transportation committee have been approved by representatives of the companies. The committee has begun discussion of the new drafts of these bills and also of the other bills pending for the proposed settlement of the traction situation. Action is expected within a short time. Mayor William Hale Thompson and Governor Len Small have reached an agreement whereby the Mayor will support the Governor in the coming April primary as the result of an understanding on several things Chicago wants. One of these is traction legislation and the Governor has agreed to call a special session of the Legislature soon after the primary in case the city and the companies reach an agreement on the terms of the proposed legislation.

Parking Areas in Philadelphia Declared Popular

The auto-parking areas of the Philadelphia Rapid Transit Company at the suburban terminals of the Market-Frankford elevated line in Philadelphia, Pa., have proved popular. A fee of 25 cents is charged for all-day parking, which includes a ride downtown and back. Thus 209,000 automobiles were kept out of the downtown streets during 1927. This proves beyond question, according to the company officials, the usefulness of this service to the individual motorists living tributary to the high-speed lines.

Red Apparel in Richmond Means Danger

Brilliant red suits will soon become the regulation attire of employees of the Virginia Electric & Power Company, Richmond, Va., who work on tracks in the streets. The decision to dress the men conspicuously was reached following a series of accidents in which track employees were struck by automobiles.

In an attempt to reduce the number of accidents on the Richmond-Petersburg Turnpike, which is traversed by the Richmond-Petersburg interurban electric railway, the fronts of interurban cars will be illuminated by floodlights. It has been found that automobilists, seeing the one headlight of an approaching electric car, mistake it for the light of a motorcycle, and assume they can cross the tracks safely.

In Michigan Transporting Furniture Becomes a Science

An unusual consignment in the transportation of furniture was accomplished recently by the Michigan Railroad. Fifteen carloads of furniture loaded at Saginaw, Mich., and destined for Battle Creek, Mich., were transported as a single shipment via the company's lines.

Railway Matter Reopened in Toledo

Efforts are being made to bring together the members of the Board of Street Railway Control, representatives of the Community Traction Company, and Mayor W. T. Jackson and cabinet members at a meeting in the near future to discuss the railway situation in Toledo, Ohio, with a special view to a solution of the power rate issue, determining a program of repaving of car-track streets, and also discussing the possibilities of a revision of the Milner service-at-cost franchise.

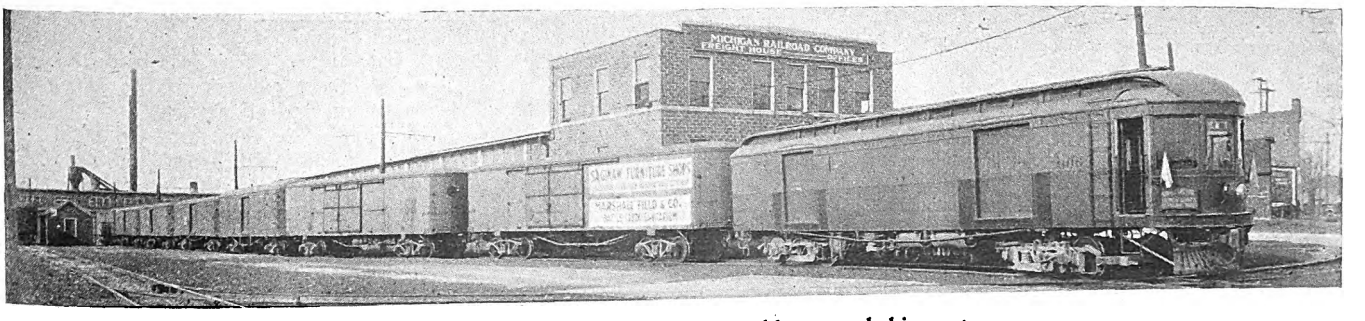
Incidentally it is expected the railway situation in Toledo will assume a different character the first week in March when under the terms of the present franchise ordinance the sinking fund payments will cease.

Through the operation of the sinking fund, 20 per cent of the capital value will have been retired. Under this plan, during the little more than six years' operation under the franchise approximately $1,800,000 of the 6 per cent bonds of the company have been retired and an equivalent par amount of common stock issued to the city of Toledo.

But the noteworthy feature of the suspension of the sinking fund will be the effect on income and outgo of the company. A difference of nearly $28,000 a month will result and this is almost enough to throw operations from red into black as regards the stabilizing fund.

In view of this fact and the results obtained in recent months in the cutting of expenses of operation to the minimum by the management, the railway board members have asked Mayor Jackson to look into the power situation. A power rate has never been definitely established and agreed upon since the operation of the ordinance. It is pointed out that company officials agreed to a revision of the rate in recent franchise negotiations. The power problem will probably be a means of opening up negotiations with the new city administration on the whole franchise matter. The possibility still exists that if the power rate matter can be adjusted the board may favor working along under the present ordinance to ascertain the results of operation without the burden of the sinking fund.

While more than $1,800,000 has been set aside for sinking fund purposes the company has gone in red on its stabilizing fund $1,272,369.



Fifteen carloads of furniture made up this unusual shipment

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Bay City May Walk Again

After having lost its railways in 1921, Bay City, Mich., now is threatened with the loss of the bus service, upon which it has depended since that time. Allen B. Doran, bus line operator, refused to comply with a recommendation to have nothing but new buses on the streets. Bus line operators appeared before the City Commission and stated they could not afford to operate the buses on a 5-cent fare. Mr. Doran asked the commission to allow him to operate his buses as long as they were in good condition. City officials told him that with no franchise they could put him off the streets at any time. He predicted that all city bus lines would fail.

Fare Schedule at Poughkeepsie Changed

The Poughkeepsie & Wappingers Falls Railway, Poughkeepsie, N. Y., has, with the approval of the Public Service Commission, arranged to sell a weekly commutation ticket book with coupons attached equivalent to 12 rides in and between the city of Poughkeepsie and the village of Wappingers Falls for $1.75. Tickets will be honored during the week for which sold (Sundays excluded). The sale of monthly commutation ticket book (52 rides for $7.80), for transportation in and between city of Poughkeepsie and village of Wappingers Falls, has been discontinued.

Chicago Judge Denies Injunction Against Parking Ban

Under a ruling of Municipal Court Judge Oscar Hebel on Feb. 11, opponents of the no-parking ordinance in the downtown loop district of Chicago, were denied a temporary injunction against the regulation. Attorneys for the petitioners, who for the most part consist of small shop owners and restaurant proprietors, immediately asked permission to file an amended bill, arguing that the parking ban is a detriment to "loop" business. One week was granted by Judge Hebel for an amended petition to be filed. It was said by court representatives that the taking of testimony on the new petition will require about 60 days, during which time the ordinance will remain in effect, thus giving it more than the three months' tests which were urged by proponents at the time the law was enforced on Jan. 10.

Boost Railway Idea in McAlester

An organization of employees formed to put the Pittsburg County Railway before the public is the talk of the hour in McAlester, Okla. Regular monthly meetings are held at which plans for promoting the welfare of the company are discussed. The slogan adopted by the organization is "ask any Pittsburg County railway employee." W. H. Goodner, promoter of the club, said that the organization desired the public to know that whatever information it wanted, especially if it were something pertaining to transportation, the information was to be had for the asking.

Madison's Future Uncertain

The City Council of Madison, Wis., has voted 16 to 4 to submit a referendum to the people at the election in April on the question of the city's taking over the Madison Railways. This action is the outgrowth of an increase in fares allowed by the Wisconsin Railroad Commission and also the charge by the commission that the financial statement of the company contained an incorrect entry.

Since the charge was made, F. W. Montgomery, president of the company, explains that in 1921 he canceled an advance of $73,951 which he made to the company, and that in 1924 the board of directors felt he was too liberal in foregoing the payment of this amount and voted that the company should repay the sum. Mr. Montgomery said:

Neither I nor other officers regarded this action as creating a liability in such a way as to make it necessary to enter this item on the books of account.

Learning that the Railroad Commission construed this transaction as a liability which should have been entered on the books, the board of directors at my request has rescinded and annulled the resolution of 1924 and has canceled said item of $73,951 and I have returned to the treasury of the company everything which I have received pursuant to the resolution of 1924.

Something New in Free Rides in Buffalo

Members of the Rotary Club of Buffalo, N. Y., and the Greater Buffalo Advertising Club received a poetic token and an actual token from the International Railway during the past Christmas season. The street car token was glued or stapled to a card 6½ in. x 4 in., with a poem printed in green and signed "I.R.C. Men and Management."

The poem ran as follows:

Here is a token of warmest good will
From those at your service, good weather or ill;
They'll carry you quickly, at any old time,
To business or pleasure, for less than a dime;
And whether your purpose be labor or lark,
There's this great advantage—you don't have to park.
Through mazes of traffic your way we will wend,
While you read your paper, or chat with a friend.
Man, it's even a cure-all for family strife—
You can leave your car home for your good friend, the wife.
As for service—we'll tell you what everyone knows—
The more that you use it, the better it grows!

Courtesy in Dallas

A courtesy campaign among its trainmen has been launched by the Dallas Railway & Terminal Company, Dallas, Tex. "The passenger is always right" is the slogan that has been adopted by George I. Plummer, superintendent of traffic. "Always treat a passenger as you would want a member of your own family treated," Mr. Plummer told the trainmen at a recent meeting held to acquaint the men with the details of the courtesy campaign. It is planned to continue the campaign for one month, during which reports will be studied.

The Contribution of the Utility to the Community

In a series of fifteen full-page educational advertisements in the New York *Times Annalist*, the Penn-Ohio Edison Company is discussing the important places the utilities occupy as integral parts of the communities they serve. Since the Penn-Ohio Edison Company's subsidiaries supply the district about Youngstown, Ohio, and New Castle, Pa., with electric light and power service, and electric railway and bus service, the advertisements tell of the growth of the Youngstown district and of the contribution made to that growth by the public utility service.

Emphasis is placed by the company on good service, good public relations, safety of investment, and public confidence. One of the advertisements is devoted to "Gold Medal Transportation," the heading being inspired by the fact that the electric railway lines of the Pennsylvania-Ohio Electric Company, a subsidiary, won the Charles A. Coffin gold medal and award for 1926. Ray P. Stevens, president of the American Electric Railway Association, is president of the Penn-Ohio Edison Company.

Mirrors and Improved Dressing Rooms for St. Louis Employees

Motormen and conductors of the St. Louis Public Service Company are to be provided with improved dressing rooms equipped with full-length mirrors to "dress up" prior to taking their cars on the road. This innovation in transportation circles was advocated by Stanley Clarke, executive vice-president of the company, at a meeting of the Engineers Club of St. Louis on Feb. 8. The subject of Mr. Clarke's talk was "The Future of Mass Transportation."

He said an effort was being made to make street car service an acceptable commodity to all persons and to sell it as such. "A very forward start," he claimed, "toward better service is the 'dressing up' of the operating staff.

Sunday pass sales numbered 20,408 on Jan. 15 and increased each Sunday thereafter through Feb. 12. For Jan. 22 the record showed 26,398; Jan. 29, 28,931; Feb. 5, 30,161, and Feb. 12, 35,360.

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Recent Bus Developments

Eighty Cents for Texas Bus Trip

The application of the Texas Motor Coaches, Inc., Fort Worth, for authority to increase its one-way bus passenger rate between Fort Worth and Dallas, 35 miles, from 50 cents to more than $1 has been denied by the Texas Railroad Commission. The commission prescribed a fare of 80 cents for the trip. In its order the commission made it clear that this rate is not necessarily a precedent to guide adjustments, because state regulation of bus lines is not old enough to allow determination of a basic cost of operation.

The Fort Worth-Dallas rate was ordered on the stipulation that the company put on modern, up-to-date equipment within 30 days on the penalty of cancellation of the increased fare. The round-trip rate was set at $1.45, good for return in ten days. The minimum fare between any two points was made 25 cents. The commission held the company's valuation of $308,000 to be too high.

Electric railway fare between the two cities is approximately 90 cents. The Texas Motor Coaches, Inc., as organized in 1927, is under sponsorship of the Northern Texas Traction Company.

Petition in Chattanooga Includes Bus Service

At a recent hearing before the Tennessee Railroad & Public Utilities Commission, the Tennessee Electric Power Company agreed to start a bus line to accommodate the Red Bank patrons of Chattanooga and promised to give transfers over its cars and bus lines within the city of Chattanooga. A franchise for such bus operation has been granted the company by the city of Chattanooga, and also the county of Hamilton. Bus service was suggested by the company at recent hearings when the company petitioned to abandon service to Red Bank. At a previous hearing permission was denied.

Chicago-Gary Coaches Compete

One-way fares on coaches of the Shore Line Motor Coach Company operating between Gary and 63rd Street, Chicago, were cut from 50 cents to 30 cents on Feb. 1. The following day, the Midwest Motor Coach Company, which also operates between these two points, announced a like reduction. Later in the week, the Shore Line Company again lowered its rates successively to 25 cents and 20 cents. The new rates were met immediately by the competing utility. According to officials of the Shore Line Company, which is controlled jointly by the Gary Railways and the Chicago, South Shore & South Bend Railroad, the reductions were made with a view to stimulating the winter traffic.

As the new rate conflict was getting under way the Midwest Company started the operation of a new bus line between Hammond and Chicago with regular 20-minute daily service on a 25-cent fare. The new route is in direct competition both as to service and fare with the Hammond-Chicago line of the Shore Line Motor Coach Company.

Permission for Illinois Bus Routes Sought

A petition has been filed by the Illinois Power & Light Corporation with the Illinois Commerce Commission for authority to establish bus routes between Venice and Lincoln, Springfield and Riverton, and Staunton and Hillsboro, supplementary to the present railway service. The utility, however, says that it does not desire to bid for local business in the Springfield and Lincoln territory now served by the Illinois Power Company and the Lincoln Street Railway.

Interstate Regulation of Motor Carriers Argued

Federal control of common-carrier motor highway vehicles generally favored at Washington hearing. Truck operators oppose proposal

ARGUMENTS were heard by the Interstate Commerce Commission on Feb. 10 on the question of whether it should recommend to Congress legislation providing for a plan of federal regulation of the operation of common-carrier motor highway vehicles in interstate commerce.

The arguments were directed to a proposed report by Attorney-Examiner Leo J. Flynn, of the commission, made public recently following an investigation of bus and truck operation, in which he recommended a plan of federal regulation which would employ state authorities or joint boards of state commissioners as agents of the Interstate Commission, subject to an appeal to the federal commission.

Federal regulation of buses was generally favored by those who presented arguments, but the manufacturers and operators of motor trucks in freight service objected to regulation because it would retard development.

Alfred P. Thom, general counsel of the Association of Railway Executives, which favors federal regulation both of buses and trucks when engaged in interstate commerce, praised Mr. Flynn's proposed report. He urged, however, that there should be but one system of federal regulation, applying alike to subsidiaries of railroads operating buses or trucks, and to carriers not subject to the act to regulate commerce. He said there is no occasion for different treatment of the carriers controlled by railroads. If certificates of public convenience and necessity, issued by the Interstate Commerce Commission, should be required before a railroad may extend its service, as under the present law, he said, he saw no reason why the same requirement should not apply to an extension of service or the operation of a new service by motor vehicle or a joint service by rail and motor vehicle.

A. J. Brosseau, president of Mack Trucks, Inc., and chairman of a special committee representing the manufacturers of motor trucks, opposed the recommendation for regulation of motor truck operations. It is the unanimous judgment of the members of the special committee, after a thorough study, he said, that there is no evidence in the record showing a demand by the shipping public for such regulation or any need for it. He said:

> The bus situation is somewhat different. The best bus service is operated over fixed routes and on definite schedules and the evidence points to the need for some regulation. I hope that you will proceed slowly. Your recommendation to Congress may have the effect of either promoting or retarding the development of this industry.

Mr. Brosseau quoted from a statement by Ralph Budd, president of the Great Northern Railway, which he described as one of the greatest bus operators in the country, in which Mr. Budd urged that the management be left as free as possible while the business is in a stage of development and that the requirement of certificates for interstate operation seems to be the principle thing needed.

R. R. Bradley, representing the American Electric Railway Association, said that the association has been recommending regulation of motor vehicle transportation for the last three years. He said:

> We find the report of the attorney-examiner very comprehensive and fundamentally sound. We feel keenly that there should be some legislation now and amendatory legislation can be added as the need for it develops.

S. A. Markel, counsel for the Bus Division of the American Automobile Association, praised the report of Mr. Flynn as a "remarkable piece of work" and said that speaking for "the fellows who are to be regulated" he was in favor of immediate legislation. He urged, however, that the regulation be simple at first, rather than restrictive. Mr. Markel agreed that the question presents difficulties but thought they could be obviated. He suggested that members of state commissions might sit together as

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joint boards but that their actual decisions might be rendered in their own states separately.

The principal objection presented by Mr. Markel to the adoption of the examiner's report was in regard to considering of "existing agencies" in granting certificates for operation of bus lines. He declared that if this language is used it means that the effect on the revenue of "transportation agencies" already operating in the territory must first be considered. He made this recommendation for requirements in granting certificates of public convenience and necessity to bus lines:

The law should provide that the fact than an applicant for a certificate of convenience and necessity was in bona fide operation one year prior to the opening date of the legislative session at which the law is passed, and since then and at the time the application is made has been continuously so engaged, shall be considered prima facie evidence as to the convenience and necessity for such operation.

The National Automobile Chamber of Commerce has filed with the commission a statement of exceptions to the attorney-examiner's report, signed by C. C. McChord, R. Granville Curry and Frederick M. Dolan, of counsel, stating that "there is no necessity or public demand for legislation. The time has not yet arrived for federal regulation of the common carrier motor truck."

Proud of Safety Record in Duluth

An enviable safety record has been made by eight motormen of the Duluth Street Railway, Duluth, Minn., during the past few years. One man served ten years without a serious accident. The three leaders in the record-making safety campaign are: Bernt Lodgaard, J. P. Ryan and Alfred Sicotte.

In August, 1926, the company started a campaign of safety among car operators, including city bus drivers, and has divided the operators into ten teams of 26 members. The year, during which the personnel of the teams remains the same, is divided into four quarters and the winning team for each quarter announced. E. T. McManus, head of the claim department, has charge of the contests.

Buses on Cincinnati Parkway

Walter Draper, president of the Cincinnati Street Railway, Cincinnati, Ohio, has sent a formal request to C. O. Sherrill, city manager, for the use of the city's Central Parkway for the operation of buses of the Cincinnati Street Railway. It is anticipated that the application will be granted. The Cincinnati Central Parkway is the down-town surface of the unfinished rapid transit system, completion of which, underground, has been in controversy many years. Mr. Draper recently stated that his company would complete and operate the system if given proper guarantees against loss.

Financial *and* Corporate

Milwaukee Company Does Well

609,417 more passengers carried in 1927 than 1926. Many improvements to transportation units. Slight decrease in net

NET capital expenditures of $6,022,048 were required in 1927 by the Milwaukee Electric Railway & Light Company, Milwaukee, Wis., to meet the growing demands for electric heating and transportation services. Net income for the year was $3,966,905 as compared with $4,025,698 in 1926. In its railway utility operations the company has been constantly mindful of its obligation to provide modern and adequate transportation facilities for its patrons. One-man car operation was extended to additional city lines, and more frequent and rapid service was provided on interurban lines. Extension of street railway tracks and service, and considerable track reconstruction work occupied a major part of the railway utility program. The system carried 210,786,573 passengers in 1927. This was an increase of 609,417 over 1926.

Some of the more important development on city lines during the year were:

Extension of street railway tracks and service along Teutonia Avenue from Nash Street to Atkinson Avenue, and along Eighth Avenue from Oklahoma Avenue to Ohio Avenue.

Double tracking of Downer Avenue from Edgewood Avenue to East Capitol Drive, and of Atkinson Avenue from 27th Street to 32d Street.

Improvement of service on the Eighth-Muskego and North Avenue lines by means of electrically heated one-man safety cars.

Rebuilding of the upper portions of the Wells Street railway viaduct.

In addition, the company completed an extensive program of reconstructing tracks and paving track zones in various parts of the city of Milwaukee and suburbs.

An undertaking which commanded the attention of the transportation utility was the completion of another rapid transit line providing more rapid suburban and interurban service on the Burlington and East Troy lines. The service was started by the company on June 20 last year.

The faster service was made possible by utilizing a cutoff extending from West Junction on the Watertown rapid transit line to the East Troy Line at Ninety-third and National Avenues. The cutoff is barely a mile long, but its strategic location together with the improved rapid transit equipment, and the elimination of operation through busy, heavily traveled city streets, have made possible a considerable saving in the running time. Because of this line, faster and more frequent connecting motor coach service to Lake Geneva, Beloit and Janesville was also made possible.

Ten New City Cars

In addition to the forty new cars purchased late in 1926 and placed in service during 1927, ten new city cars were purchased in 1927. These cars are to be used on the State Street line, recently converted to one-man car operation. Innovations in these new cars are genuine leather upholstered seats and greater seating capacity. There are semi-indirect light fixtures, electric heaters, automatic treadle exits, concealed air-control pipes and the latest safety devices, also.

At its Cold Spring shops, the company constructed nineteen de luxe railway coaches for rapid transit service. It purchased also, two large street-car type buses and a number of smaller buses.

The Transportation Training Building was dedicated and put to use during the year. Here prospective trainmen, bus operators and maintenance men are taught their new jobs. In addition to class rooms for "academic" instruction, there are "laboratories" in which new employees gain actual experience with the vehicles they will later operate or repair.

An attractive interurban railway and motor bus terminal was built at Watertown to accommodate the growing popularity of the rapid transit line between Milwaukee and Watertown, with connecting motor coach services to Madison, Janesville and Beaver Dam. The terminal provides commodious shelter, heated waiting rooms and ticket offices and ample facilities for handling baggage and checking of parcels. Transfer between cars and motor coaches is entirely under shelter.

The relations between the employees and the company continue to be satisfactory. The Employees' Mutual Benefit Association now has 6,415 members.

INCOME ACCOUNT OF THE MILWAUKEE ELECTRIC RAILWAY & LIGHT COMPANY

Gross Earnings	1927	1926
Operating revenues	$27,157,902	$26,219,754
Non-operating revenues	349,648	335,348
	$27,507,550	$26,555,102
Operating Expenses:		
Operating expenses and maintenance	$16,053,184	$15,369,656
Depreciation (reserve credit)	2,031,590	2,043,191
Taxes	2,543,638	2,283,191
	$20,628,413	$19,696,039
Gross income	$6,879,136	$6,859,062
Interest Charges:		
Interest on funded and unfunded debt	$2,305,744	$2,266,754
Interest on depreciation reserve balances	558,402	521,979
Interest on other reserves	48,084	44,630
	$2,912,231	$2,833,364
Net income	$3,966,905	$4,025,698

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Of special interest to the association was the completion and dedication of its new lodge hall in the Public Service Building.

This association continues to be a very important factor in establishing homes for the employees and their families. Since its inception in April, 1914, the association has provided upwards of $12,793,651 for this purpose. More than 80 per cent of all married, permanent employees own their homes.

During the year $5,378,300 of 6 per cent preferred stock was sold through the company's own securities department, and was distributed widely to customers in the service area. The amount of outstanding 7 per cent preferred stock was increased $268,900 by completion of payments by customers purchasing on the installment plan. North American Edison Company, owner of the entire outstanding common stock of the company, purchased $2,000,000 of additional common stock to provide part of the funds required for additions and extensions to the company's properties.

The increase in funded debt resulted from the issue of $2,500,000 of refunding and first mortgage 5 per cent bonds, series due 1967. The amount of refunding and first mortgage 5 per cent bonds, Series B, increased $2,377,000, due to the issue of such bonds in exchange for outstanding general and refunding mortgage 5 per cent bonds of equal amount.

Utility Bonds Recommended by New York Legislature

Interest was aroused in the financial district recently over the favorable report made by the New York legislative committee on the proposal to extend the list of bonds legal for savings banks and trust companies of the state. It is proposed to extend the list to include a certain proportion of public utility bonds, equipment trust obligations, and certain other changes in the present law are recommended.

In part the report said:

Equipment trust obligations are also deemed to be obligations of such high character that they may safely be recommended for savings bank investment. They cover rolling stock and equipment necessary to the operation of the railroads, which insures that such obligations will be met even though the railroad issuing them should itself become financially involved. It is proposed to admit to the legal list only those equipment trust obligations which are obligations of railroads, the bonds of which are now legal. They must be a first lien on rolling stock, shall not exceed in amount 80 per cent of the cost of such equipment and shall be payable in installments and over a period of not to exceed fifteen years with proper provisions for upkeep, replacement, payment of taxes and other charges.

Bills carrying out the recommendations in the report will be introduced shortly by the committee. Last year this legislation was handled by Assemblyman Willis Sargent of Syracuse. Objections to the proposal from upstate sources are that it would put savings banks in competition with trust companies and would make it difficult for home builders of ordinary means to borrow money from savings banks on mortgages. The contention is that the savings bank deposits would be tied up in public utility securities.

Unification Agreement in District of Columbia

A unification agreement has been signed by the Capital Traction Company, the Washington Railway & Electric Company, and Harley P. Wilson, the owner of 21,237 shares of the stock of the Washington Rapid Transit Company. It is proposed to create a new company to be known as the Capital Transit Company which is to operate the street railways and bus lines which the three companes now are operating in the District of Columbia and near-by regions. The plan for combining these operations must be approved by the Public Service Commission and by Congress. The agreement specifies, however, that each party to the contract is to be restored to complete liberty of action if the plan is not accepted on or before June 1, 1929.

The new company will take over all of the property and outstanding securities of the Capital Traction Company, the 21,237 shares of the Washington Rapid Transit Company and the street railway portion of the business of the Washington Railway & Electric Company. The power business of the company will be continued as a separate entity, but the agreement provides that power is to be furnished the new company at reasonable rates. Initially authorized capital of the new company is to be comprised of 300,000 shares of preferred stock of the par value of $100 per share and 300,000 shares of common stock to have a par value of $100 per share.

This agreement provides for the elimination of the requirement that crossing policemen be paid by the street railway operators. Under the agreement the new company is also to be relieved of the cost of paving streets between its rails.

Operation in Colorado Springs to Continue

The receipts of the Colorado Springs & Interurban Railway, Colorado Springs, Col., are such as to lend hope that with the present economical management, there will be no need to discontinue operation. Some of the heaviest losing lines have been discontinued and in some places buses have been installed, so that operation in 1928 appears assured.

Some time ago the company suggested that the city purchase the railway system and offered it for $500,000, 50 per cent to be paid the company in city bonds. After deliberating the matter for some time the City Council rejected the proposal.

Agreement on B.-M. T. Acquisition Practically Reached

An agreement with representatives of the Brooklyn-Manhattan Transit Corporation, Brooklyn, N. Y., Samuel Untermyer, special counsel for the Transit Commission, and John H. Delaney, chairman Board of Transportation, was recently reached practically on all points relating to the acquisition of certain railway property by the city except as to the price to be paid. A bill is being drafted for submission to the Legislature for creation of a transit authority to take over the B.-M. T. lines. The city plans seizure of the Interborough Rapid Transit Company by default under Contract 3 if the company advances fares to 7 cents. Agreement with Manhattan Railway stockholders will be attempted by the city whereby elevated lines would be turned over to the city for operation with the new municipal subway system if the Interborough should be obtained by default.

Surrender of Franchise in Marshall, Texas

The East Texas Public Service Company, subsidiary of the American Public Service Company, which has held the franchise for railway operation in Marshall, Tex., has reached an agreement with the city authorities under which the franchise is to be surrendered to the city. The company is to pay the city $12,000, in return for which it is to be relieved of all further obligation in the operation of street cars, and will also be relieved of the responsibility of removing the car tracks from the streets. This agreement marks the end of the operation of street cars in Marshall. Buses were accordingly operated for some time, but a few months ago announcement was made by the company operating them that the service would be discontinued as it was being operated at a loss.

Brief Filed for Dismissal of City Utilities Company

City Counselor J. T. Muench of St. Louis, Mo., filed with the Missouri Public Service Commission at Jefferson City on Feb. 9 a brief and argument in support of the city's application for a dismissal of the petition of the City Utilities Company of Delaware to acquire and hold 25,000 shares of the preferred, series A, and 170,000 shares of the common stock of the St. Louis Public Service Company. A state law prohibits a foreign corporation from holding more than 10 per cent of the stock of a public utility without the permission of the Public Service Commission. Counselor Muench contends that the Delaware company has failed to obtain a Missouri license and therefore has no legal status in the state, being outside the pale of the commission, which cannot legally entertain the application.

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First Dividends to Mitten Bank Securities Holders

Mitten Bank Securities Corporation, Philadelphia, on Feb. 15 paid an initial dividend for the five months period ended Dec. 31, 1927, at the rate of 5 per cent per annum (2.0833 per cent) on the paid-in value of the part-paid common stock of the corporation.

At the same time the company paid an initial dividend for the five months period ended Dec. 31, 1927, at the rate of 6 per cent per annum (2.50 per cent), and an additional dividend at the rate of 1 per cent per annum (0.4167 per cent), the total dividend for the five months period being at the rate of 7 per cent per annum (2.9167 per cent) on the paid-in value of the part paid preferred stock.

Illinois Traction Inter-Company Deal

The Illinois Traction, Inc., has transferred to the Illinois Power & Light Corporation all its properties devoted to the generation and transmission of electrical energy in compliance with the recent decision to centralize all power units with the Illinois Power & Light Corporation, leaving the Traction system in control of transportation activities only. The entire deal is an inter-company transaction. Under the new plan the Illinois Traction has transferred titles to substations in a score of points along its routes with the new lessee authorized to reconstruct, enlarge and replace with steel towers all transmission lines on its right-of-way. All meters and marketing equipment for the sale of current are transferred, the Traction company having furnished power for industries along its line. The Traction line assumes bonds and deeds of trust of the Illinois Power & Light Corporation against the St. Louis, Springfield & Peoria Railroad and other lines involved in a recent merger of Illinois Traction and its subsidiaries. The power house in Peoria is one of the largest units included in the deal.

Meetings on Hocker Rejuvenation

Approximately 400 persons attended a meeting Feb. 2, at Shawnee, Kan., to discuss plans for financing a new company to purchase and resume service on the Hocker line, the defunct Kansas City, Lawrence & Topeka Electric Railroad, which formerly operated between Kansas City and Rose Hill, Kans.

Committees were appointed Feb. 6 to canvass in Monrovia, Rose Hill, and Shawnee for stock subscriptions. The committees will meet in the Shawnee State Bank later to report progress. Another community mass meeting was held in Merriam, Kan., on Feb. 4, to present the project.

W. K. Paul, manager of the line before it was sold to the Sonken-Galamba Corporation, outlined a plan whereby a new company may be formed if $10,000 in 7 per cent preferred stock is purchased by patrons of the line. When this stock shall have been subscribed the Sonken-Galamba Corporation has agreed to purchase $16,000 in bonds and the Kansas City Public Service Company $15,000 in bonds.

Financial Structure in Fort Wayne to Be Simplified

Plans for the simplification of the capital structure of the Indiana Service Corporation, Fort Wayne, Ind., involve the retirement of approximately $4,800,000 in bonds. Provision has been made for a new mortgage under which $5,000,000 of 5 per cent first lien and refunding mortgage bonds, Series A, due on Feb. 1, 1963, have been issued and sold to Halsey, Stuart & Company, New York and Chicago.

The new capital structure of the corporation will consist of the first and refunding bonds, which now become first mortgage bonds, totaling $7,566,500, the new series of $5,000,000 first lien and refunding 5 per cent bonds, and $145,000 of non-callable underlying divisional bonds which are gradually being exchanged for an equal amount of first mortgage bonds on deposit with the trustees for this purpose.

Changes in Buffalo Financial Structure Are Sought

Stockholders of the International Railway, Buffalo, N. Y., will be asked at a special meeting called for Feb. 20 to approve the issuance of $2,000,000 preferred stock and no par value common stock in exchange for the common stock of $100 par value. Bernard J. Yungbluth, president of the International, says this change is desirable to improve the company's credit position and strengthen its financial structure.

Substitution of no par value stock for $100 par value common now outstanding and the resulting changes in the balance sheet of the railway, have been approved by the Public Service Commission. Application for approval of the proposed issue of preferred stock will be made to the commission concurrently with authorization by the International Railway stockholders.

Mr. Yungbluth said that conditions making these changes desirable had their inception in 1912, when the company mortgaged its property. At that time, according to President Yungbluth, the Public Service Commission ordered the International Railway, to set up on its books an item of $12,651,500 as tangible capital to be amortized over a period of years. Of this amount approximately $4,000,000 has been written off. The company also is carrying on the asset side of its balance sheet an item of $6,000,000 listed as strike expense which should be written off over a period of years and which the present proposed financial plan will permit to be written off at once.

Part of Seattle Loan to Meet Tax

Part of a recent loan of $550,000 from the light department to the Seattle Municipal Railway, Seattle, Wash., will be used to make a first payment on the 1919 railway tax if a bill introduced in the City Council is adopted. The measure provides that the city pay $115,000 next May. The money will go to the Puget Sound Power & Light Company. The total 1919 railway tax was $401,017. Under an agreement, the city was to pay three-fourths, and the company one-fourth. Both the company and the city fought the tax and carried an appeal to the United States Supreme Court, where the tax was finally upheld. As the judgment was levied against the company, it paid the tax, which, with interest, came to $655,279.

The company then sought to collect three-fourths of the amount of the tax from the city. More court action ensued. Judgment finally was returned in favor of the company. Since the financial condition of the municipal railway was precarious the City Council obtained an agreement with the power company to pay the tax money in five installments beginning next May. Councilmen had this tax debt in mind recently when they passed an ordinance loaning $550,000 to the railway from the light department.

Receivers for Michigan Property

The Southern Michigan Railway, operating an interurban service between South Bend, Ind., and Benton Harbor, Mich., passed into the hands of receivers in the federal district court of Grand Rapids on Feb. 3, when suit was brought by the Harris Trust & Savings Bank, Chicago, to foreclose a mortgage for $750,000, of which $536,000 with interest has been due and unpaid since Oct. 1 last. Haddon McLean, of the Harris Trust & Savings Bank, and the Michigan Trust Company were appointed receivers and trustees by Federal Judge Fred M. Raymond.

The property will be operated by the Chicago, South Bend & Northern Indiana Railway, owner of the common stock. Through the lines of the Northern Indiana Company it has physical connections with a number of electric railways radiating from South Bend. The Chicago, South Bend & Northern Indiana Railway was placed in the hands of R. R. Smith, formerly general manager, as receiver.

Taxes Paid in St. Louis

Taxes to the amount of $2,065,489 were paid by the St. Louis Public Service Company, St. Louis, Mo., to the city, county and state during 1927. On Feb. 2 the company paid the city mill tax for the last quarter of 1927 amounting to $62,698.

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Personal Items

J. J. Schweitzer Promoted in Cincinnati

John J. Schweitzer has been named assistant superintendent of shops and equipment of the Cincinnati Street Railway, Cincinnati, Ohio, and will be actively in charge of the work in the large new shops which the company is building in Winton Place, a suburb. When a boy he observed the electrification of Cincinnati cable cars. At the age of 17 he entered the employ of the company in Cincinnati. He became foreman of the armature department of the Cincinnati Car Company in 1905, a foreman of the Cincinnati Traction Company in 1908, and a superintendent of that company in 1917.

Change in Offices in Oklahoma City

At the recent election of officers of the Oklahoma Railway, Oklahoma City, Okla., G. A. Nichols was elected vice-president and William Mee, president of the Security National Bank, was elected treasurer. The vice-presidency has been vacant for several months, but Miss Reba Zimmerman had been holding the post of treasurer, and may continue to handle the detail of the treasurer's office.

H. O. Crews Supervisor of Public Relations

Halbert O. Crews, supervisor of publicity for the Chicago Surface Lines, has been made supervisor of public relations. All publicity, advertising, public speaking and similar work is under his direction.

H. U. Wallace in New York

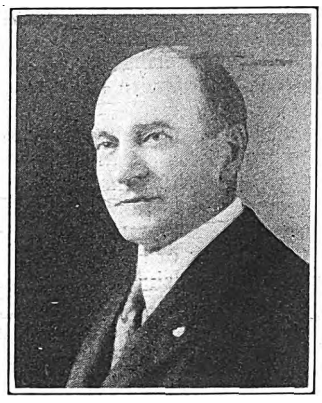
H. U. Wallace, former general manager of the Department of Street Railways at Detroit, Mich., is now engaged as a consultant, with offices in New York. He will handle operating surveys, financial reports, appraisals, reorganization and management detail in the bus, truck and railway fields.

The work which will come under Mr. Wallace's personal supervision will have the benefit of an enriched background in the railway field and the deft handling of a capable manager. Thirty years of engineering and railroad experience he brought to Detroit when in June, 1925, he took over the management of the Detroit municipal property. He had previously served with the Knoxville Power & Light Company, the Illinois Central, the Chicago, Lake Shore & South Bend Railway and the Fort Dodge, Des Moines & Southern Railway. And these affiliations cover only part of his active career in the fields of engineering and management.

Colonel Wallace was born in Rock Island, Ill., in 1872. He was graduated from Purdue University. During the World War he was commissioned as major of engineers and assigned to the construction division as supervising construction officer of a large number of important ordnance plants. The career of Mr. Wallace has been reviewed at length previously in the ELECTRIC RAILWAY JOURNAL.

C.E.R.A. Headed by Detroit United Official

W. S. Rodger, general traffic manager of the Detroit United Lines, Highland Park, Mich., is the new president of the Central Electric Railway Association. All his business life Mr. Rodger has been connected with railways in the Central West, first in steam railroad work and since 1916 with the Detroit United.



W. S. Rodger

The Detroit suburban and interurban system furnished a fertile field for a man of his talents, since its service approximated in character that of the steam lines with which he had long been associated. This was true before the lines of the company in Detroit passed to the ownership of the city, but it has been particularly true since that time. The need has grown for intensive operation of the property under the direction of the receiver, and in the work of stimulating business and in mechandising the service Mr. Rodger has played his part well.

Mr. Rodger was educated in the public schools of Chicago. He entered steam railroad work in the operating department of the Michigan Central Railroad in that city, went from Chicago to Joliet in the same service but returned to Chicago as traveling freight agent. Thence he went to Toledo as general agent in the traffic department of the Michigan Central Railroad, and from that post was advanced to assistant of the general manager at Detroit. On Aug. 1, 1916, he resigned from the Michigan Central to accept the post with the Detroit United Lines which he now occupies.

Robert Jagoe Advanced in Bridgeport

Robert Jagoe has been appointed superintendent of transportation of the Bridgeport lines of the Connecticut Company. In this capacity he succeeds F. L. Kibling, who was recently made general manager of the Bridgeport division.

Mr. Jagoe joined the Bridgeport Traction Company in 1895. Three years later he became inspector, serving in this capacity with the Bridgeport Traction Company, the Connecticut Railway & Lighting Company and the Connecticut Company. In 1912 he was made chief motorman and has served in that capacity since. Mr. Jagoe is succeeded as chief motorman by Wilfred Norman, who has been starter since 1914.

Obituary

JOHN H. TRUETT, former safety director and former chairman of the safety committee of the United Railways & Electric Company, Baltimore, Md., died on Feb. 5. Mr. Truett took over safety work in Baltimore in July, 1919, and resigned in 1925 to accept the position of director of the Baltimore Safety Council. During the World War Mr. Truett served overseas as a battalion adjutant. He was 47 years old.

WILLIAM T. GUNNISON, chairman of the New Hampshire Public Service Commission, died recently. Mr. Gunnison had practiced law in Rochester since his graduation from the Harvard Law School in 1895 and was a law partner of former Gov. Samuel D. Felker. He was born in Greenville, Miss., in 1869 and attended Phillips Exeter Academy and Dartmouth College. At one time he was judge of the Municipal Court in Rochester.

ANGELO VANCE FAWCETT, four times mayor of Tacoma, Wash., died there on Jan. 22, at the age of 81 years. During his entire political life Mr. Fawcett opposed the utilities, even going so far during his last term in office as to encourage an extensive use of jitneys to compete with the railway lines of the Tacoma Railway & Power Company. He finally went down to political defeat in a campaign in which the voters were convinced that his tactics were only hampering Tacoma's growth.

O. M. CARTER, one of the organizers in the building of the first electric railway in Houston, Tex., died on Jan. 6. During his 38 years in Houston he was active in public utility and civic improvement projects.

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Manufactures *and the* Markets

Who Pays the Cost of Price Cutting?

A frank discussion of the warfare now being waged between the purchasing agents and the sellers in this buyers' market

By Earl Whitehorne
Commercial Editor "Electrical World"

WITHIN the memory of this generation there has never been a time when business men were talking more about the ethics and the economics of price cutting. It is an engrossing subject of conservation in the electrical industry right now. It concerns the power companies because they are large buyers. It concerns the electrical manufacturers because they are selling to these large buyers. It concerns them in the same way that the same conditions are involving other large buyers and sellers in numerous other industries. But the fact that these conditions are general does not make them any less particularly a problem which the electrical industry must face in its own field and work out for itself.

In a Buyers' Market

We are of course in a buyers' market. There is excess capacity and overproduction in manufactured products and an intense competition for orders. But that is not all. We have had other periods when the buyer was in the saddle, riding the salesman whip and spur, just as we have had sellers' markets, when demand exceeds supply and the pressure has been upon the purchaser—during the war, for instance. And whereas then the salesman was playing one buyer against another for a better price, the purchasing agent today is juggling one seller against another for a lower figure. It is not unnatural. The purchasing agent feels that it is now his time to be the wolf. It is his night to howl. But times have changed and what was once considered a fair game of bartering has come to be a matter of the economics of an industry.

There has been much progress in the thinking of American business. The pack peddler and the patent medicine man have gone their way with their wooden nutmegs and fake nostrums. The days of barter in the village store have given place to a one-price policy in retail trade. Modern business ethics have purged the manufacturing field of many practices that once were looked upon as quite legitimate but now are recognized as unfair either to the customer or the competitor. And now a new advance in the evolutionary process has introduced another idea—the responsibility of business men to protect the economic health of the industry in which they are engaged.

In other words the growth of American industry has brought with it an extremely complex inter-relationship among manufacturers and between buyers and sellers throughout the land. Specialized production has developed a tremendous volume of inter-industry trade in materials, equipment and services, and also large concentrations of capital and industry have resulted in a degree of interdependence between the buyer and the seller in such an industry as ours as has never been known before. And the present discussion of the prevalence of price cutting by manufacturers and profiteering by large purchasers has to deal with these new conditions.

Obviously it is poor business to be a party to a transaction in which either side is going to lose money. That is just common sense. For it usually costs more to win a new customer than the profit on the first order he gives. It is the continuing business from the account that pays, and it costs money also for a large buyer to take on a new supplier and establish an understanding of special needs and a dependable service. Usually it costs more than is gained by changing to another line just to seize a slight price advantage on the initial order—too often offered as a bait.

But there is more to it than that today. For so vast is the flow of goods and so greatly is the modern buyer sustained in his own business by his suppliers, that a large industrial organization has come to be vitally concerned with the prosperity of the other organizations from which it draws. Put a manufacturer out of business by rendering it impossible for him to make money and you must look elsewhere for your next shipment of whatever it is you need. Let him live and he will continue to help you make more money. And that is precisely the philosophy that has dominated in those much heralded cases where a large buyer has examined into a seller's costs and refused to accept cut prices that netted him a loss, knowing that either this seller must hereafter skimp on quality or service or ultimately go to the wall—unless the price level is restored.

Engineering Development Sponsored By Manufacturers

In the electrical industry where an expensive engineering type of equipment is involved the buyer also relies upon the manufacturer for another vital resource. He looks to the manufacturer to advance the art, to conduct expensive research, to carry forward the progress of engineering development. And if the manufacturer is denied profits that are adequate to finance the cost of this, then this will gradually cease and the industry must sacrifice one of its most priceless assets, unless the buyer assumes the burden.

Samuel Insull stated it well for electrical men, in a much quoted address in Chicago not so long ago. He said:

> You men who are in branches of the business other than central station business—you have problems of your own. But the interdependence of the industry makes your problems ours, as it makes our problems yours. Central station development creates the market for you and keeps it expanding. Development on your side assists our efficiency and facilitates use of our product.
>
> If competition in the sale of turbo-generators or cables or transformers is so keen as to hamper research work and threaten the quality or the rate of development; if too narrow margins restrict the wholesaler's ability to carry adequate stocks, supply sales service and extend credit to the retailer; if the keenness of competition between contractors impairs the adequacy or quality of wiring; if construction is hampered or not properly remunerated on account of policies in other branches of the business—if any of these things happen, the central station companies, which use those materials and services, finally suffer the most.
>
> And last of all the paramount responsibility, imposed upon all of us by our common interests, is to see to it that no obstacles are placed in the way of general electrical development—a development that is not yet nearly completed but has already done so much to make our country the envy of all the world.

Some Experiences in Price Cutting

The purchasing agents of large buyers are being accused of profiteering. The complaining manufacturers are being charged with lack of price courage. What is it all about?

In this article Mr. Whitehorne arrays the major factors in the situation. There will follow a further discussion of "Some Experiences in Price Cutting" in which the methods that are at present demoralizing the market for electrical apparatus will be described. The editors will welcome a frank expression from our readers on this important and much disputed issue.

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Coming down to cases—Just what is the situation in the electrical industry? Two things are happening:

1. Purchasing agents of large buyers are rigorously applying the thumbscrews to the manufacturers' salesmen and beating down price levels by ingenious methods of induced competition.

2. Manufacturers in their eagerness for volume are weakly submitting to this pressure and cutting prices to get orders that net a loss and demoralize their market.

The first reaction is to just say: "Well, under the circumstances the purchasing agents are smart and the manufacturers are not. Why worry?" But when you look ahead and ask yourself what the consequences may well be within this highly interdependent community of business interests if this condition should continue very long, you realize that in the end the buyer would suffer with the seller, and the entire industry would be the loser by it all. Large scale profiteering by purchasers, widespread price cutting by manufacturers in this day and age soon become a common problem.

What is to be done? It would seem that the burden of reform would rest upon the manufacturers who possess the right to accept an order or decline it as they wish. But as every manufacturer knows, the demand for volume is a remorseless pressure upon the sales department that must feed orders into the hungry hopper of a modern factory. And since the Sherman law forbids competing manufacturers to organize for mutual protection against the snares and pitfalls of a buyer's market, each one must take his chances in the open strife, and the price that can be charged depends upon the level of the market for competing lines. Let one sales manager weaken in the face of a persistent price-squeezer and let a second fall in line and no other bidder can hope to hold to his figure and secure the business.

Apparently there remains but one legal and practical defense to which the manufacturer may have recourse. That is the organizing of industry opinion, to correct uneconomic practices and improve the standard of executive policy among both the buyers and the sellers. In other words, he must broaden the vision of the purchasing agent and stiffen the spinal structure of the sales manager.

Too Much Secrecy

The seat of the present trouble, it would appear, lies in the old tradition of the secrecy of bids, for here is the keenest weapon that the buyer is employing at the moment. A group of manufacturers are invited to submit bids on equipment to be purchased. The bids are in. The salesmen call. The purchasing agent thereupon proceeds privately to play each man against the others, telling each that he is high, inciting each to telephone the factory, whipsawing them with fear and hope until the last price cut has been exacted and the last unhappy concession wrested from the profit margin on the goods. Too often he who was the low man at the outset is the low man at the end but minus profit. Too often also the order was all the time intended for him for some good consideration of the quality or service offered, in return for which he has been mulcted of his company's earning power on that sale. Because of the traditional sanctity of bids, he has been unable to demand a showdown when the bids are in, a chance to see whose price is really high. For there are lying purchasing agents as well as lying salesmen, and the temptation to play tricks with truth is sometimes great in buying.

Clearly, therefore, there are three things to be done as an approach to a remedy:

1. Secrecy should be eliminated on bids for standard listed apparatus. Bids are published on government orders. Bids to private purchasers should be open to examination by any manufacturer who is called back and asked for a revision of his price. At present it is not supposed to be morally right to show a bid to a competitor. Where the bid entails a large element of engineering or other variables this secrecy will undoubtedly continue. But on standard listed apparatus—and this covers the major volume of the sales of industry—the buyer should show the bids when asking any bidder to reduce his price.

2. Salesmen should demand this frank showdown—whenever called upon to cut a price after the bids are in. He should expect it as an evidence of good faith on the part of the buyer. Manufacturers should refuse to consider a concession without this evidence.

3. The holding of post mortems on competitive bids should be made standard practice among all electrical manufacturers, so that losers may analyze all bids and understand their lost business. This is lawful and already is being done to some extent, the exchange of bids being made by the bidders. The National Electrical Manufacturers Association is actively promoting this idea and serving as clearing house for its members. The practice should be general.

Of course, this would not end all cutting of prices. It would simply bring the practice out into the open and improve its morals. It would be a step toward an eventual one-price system.

But the seller should not be made to fight for this reform unaided. Purchasing agents individually and as nationally organized should also become the exponents of this idea. It is another step to be taken in the de-bunking of business, the banishing of deceit and trickery from trade. In this era of economic intelligence the gentle art of profiteering by purchasers should be laid away in shrouds along with the wooden nutmeg and that once popular commercial slogan—*caveat emptor!*

For men do not buy for price alone. Price is important. But other factors are equally important because they themselves constitute the value, for which the price is paid. The chief concern of the buyer should be to see that he obtains a value proportionate with the price. The chief concern of the seller should be to see that he obtains a price commensurate with the value. And these two ideals are not antagonistic. They go together like the well known words—*E pluribus unum*—to use more Latin.

Who pays the cost of price cutting, then? Both the buyer and the seller pay it. And in the end the entire industry suffers.

Three Recommendations

1. That bids on standard listed apparatus should be offered for examination by any bidder who is called back and asked for a reduction of his price.

2. That salesmen should demand this as evidence of good faith on the part of the buyer whenever asked to cut a price after bids are in.

3. That post mortems on competitive bids should be made standard practice among all manufacturers so that losers may understand their lost business.

Track and Terminal Work Planned by C., A. & E.

The Chicago, Aurora & Elgin Railroad, Aurora, Ill., has been granted authority to relocate its tracks in that city, along the river bank from New York Street north to the point where the track turns into Broadway. The Dellinburg block at the intersection of Broadway and New York Street is to be remodeled and used as a new terminal. It is reported that the relocation will relieve much of the Broadway traffic congestion through removal of the third rail cars from that thoroughfare. Col. Edward Blair, general manager of the traction line, estimates that the new construction work will require eight months and will be started as soon as final rights-of-way are obtained.

Westinghouse Manufacturing Executives Promoted

Announcement has been made by J. M. Hipple, works manager of the East Pittsburgh works, of the appointment of E. C. Brandt and F. J. Shiring as assistant works managers, and of J. E. Webster as chief plant engineer.

Changes simultaneously announced by E. R. Norris, general works manager, are the appointment of A. E. Kaiser as director of production for all works and S. C. Hoey as works manager of the Homewood renewal parts works.

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London Plans Extensive Car Overhaul

Further particulars of the program of the London Underground electric group of railways, costing $12,500,000, are now available. The work intended to be carried out is expected to take about two years to finish and to include a complete overhaul and renewal of the old rolling stock and equipment, so as to bring it up to the standard of efficiency represented by cars recently put in operation. Temporary shops for the purpose have been constructed at Feltham, and the existing shop at Acton has been considerably enlarged.

The new equipment to be purchased includes motors, control, door equipment and cars. The new cars on the tube railways will have pneumatically-operated doors, but the District cars will retain the present hand-operated doors.

Economic Situation to Be Surveyed by Hoover Committee

Secretary Hoover has announced the personnel of the committee which is to make a survey of recent economic changes in the United States as follows:

John J. Raskob, vice-president General Motors Corporation, New York; Owen D. Young, chairman General Electric Company, New York; Daniel Willard, president Baltimore & Ohio Railroad, Baltimore; A. W. Shaw, president A. W. Shaw Company, Chicago; Lewis E. Pierson, president United States Chamber of Commerce; William Green, president American Federation of Labor; John Lawrence, president New England Trade Council; Adolph C. Millert of the Federal Reserve Board; Max Mason, president University of Chicago; George McFadden, Philadelphia; Louis J. Taber, master National Grange; Clarence M. Wooley, chairman American Radiator Company, New York; Walter F. Brown, Assistant Secretary of Commerce, and Secretary Hoover, chairman of the committee.

The committee will meet in New York on Feb. 21, to start its inquiry in conjunction with the National Bureau of Economic Research.

When he announced on Jan. 26 his determination to appoint such a committee, Secretary Hoover stated that the committee will "supervise a far-reaching inquiry into the changes in economic currents in the country."

Copper Prices Fairly Steady

Business has not been brisk in any of the metals, although the cut in lead stimulated some buying.

After ruling at 6.50 cents for two and one-half months, the price of New York lead has been cut; tin continues its downward course; zinc has eased slightly; but copper prices are pretty well maintained, with "primary" producers firm at 14.125 cents. On the other hand, sales at various prices between 14.00 and 14.10 cents, have been made, the lowest being reached Feb. 15, when one lot was sold for 14 cents.

Last Friday, Feb. 10, the American Smelting & Refining Company cut its contract price from 6½ cents, New York, at which level it had held since Dec. 1, to 6.35 cents. The St. Louis market has also weakened, lead having been sold on Feb. 14 and 15 at various prices between 6 and 6.15 cents.

Straits tin for prompt delivery sold Feb. 15 at 51¼ cents.

Dullness has pervaded the zinc market and prices have softened. Metal was to be had Feb. 15 at as low as 5.575 cents.

Stark Electric Program Includes Three New Cars

The purchase of three new one-man interurban cars from the Cincinnati Car Company is the major item in the improvement program costing about $70,000 to be carried out by the Stark Electric Company, Alliance, Ohio. These improvements are to be made to increase service between Alliance and Canton, and between Canton and Louisville, Ohio, the latter a distance of 5 miles.

Other work proposed is construction of three sidings and a loop between Canton and Louisville, and installing an automatic block signal system from Alliance to Canton. The new construction will cost about $10,000 and the signal system about $15,000, according to E. W. Sweezy, general manager of the company.

Two Cars for Fitchburg Road

An additional sales agreement between the Fitchburg & Leominster Street Railway, Fitchburg, Mass., and the Wason Manufacturing Company, Springfield, Mass., covering the purchase of two light-weight double-truck cars has been approved by the Massachusetts Department of Public Utilities.

ROLLING STOCK

FORT DODGE, DES MOINES & SOUTHERN TRANSPORTATION COMPANY, subsidiary of the Fort Dodge, Des Moines & Southern Railroad, Boone, Ia., has accepted delivery on two 27-passenger A.C.F. parlor coaches.

SHOPS AND BUILDINGS

BRITISH COLUMBIA ELECTRIC RAILWAY, Vancouver, B. C., it is reported, will expend $70,000 in construction of two large substations as already planned, and plans are under way for several others. The two planned will be undertaken at once.

ADVERTISING LITERATURE

OHIO BRASS COMPANY, Mansfield, Ohio, is sending out in folder form the reprint of an article which appeared in the ELECTRIC RAILWAY JOURNAL for Dec. 17, 1927, entitled "Catenary with Unusual Pole Spacing Withstands Cyclone," by L. W. Birch, line material engineer of that company.

MITCHELL-RAND MANUFACTURING COMPANY, New York, is mailing a card directing attention to the advantages of its "E.B." Insulating Paint and "2098" black paint.

GENERAL ELECTRIC COMPANY, Schenectady, N. Y., has issued a loose leaf folder, entitled C R 3110 drum controllers.

ELECTRIC RAILWAY MATERIAL PRICES—FEB. 14, 1928

Metals—New York

Copper, electrolytic, cents per lb.	13.85
Lead, cents per lb.	6.325
Nickel, cents per lb.	35.00
Zinc, cents per lb.	5.95
Tin, Straits, cents per lb.	52.00
Aluminum, 98 or 99 per cent, cents per lb.	24.30
Babbitt metal, warehouse, cents per lb.:	
Commercial grade	61.00
General service	31.50

Bituminous Coal

Franklin, Ill., screenings, Chicago	1.825
Central, Ill., screenings, Chicago	1.575
Kansas screenings, Kansas City	2.125

Track Materials—Pittsburgh

Standard steel rails, gross ton	$43.00
Railroad spikes, drive, ⅜ in. and larger, cents per lb.	2.75
Tie plates (flat type), cents per lb.	2.25
Angle bars, cents per lb.	2.75
Rail bolts and nuts, cents per lb.	3.90
Steel bars, cents per lb.	1.85
Ties, white oak, Chicago, 6 in. x 8 in. x 8 ft.	$1.40

Hardware—Pittsburgh

Wire nails, base per keg	2.65
Sheet iron (24 gage), cents per lb.	2.90
Sheet iron, galvanized (24 gage), cents per lb.	3.65
Galvanized barbed wire, cents per lb.	3.35
Galvanized wire, ordinary, cents per lb.	2.50

Waste—New York

Waste, wool, cents per lb.	16–20
Waste, cotton (100 lb. bale), cents per lb.:	
White	16–19.50
Colored	11-16

Paints, Putty and Glass—New York

Linseed oil (5 bbl. lots), cents per lb.	10.2
White lead in oil (100 lb. keg), cents per lb.	13.25
Turpentine (bbl. lots), per gal.	$0.65
Putty, 100 lb. tins, cents per lb.	5.25–5.50

Wire—New York

Copper wire, cents per lb.	16.125
Rubber-covered wire, No. 14, per 1,000 ft.	5.30
Weatherproof wire base, cents per lb.	16.50

Paving Materials

Paving stone, granite, 5 in. New York—Grade 1, per thousand	$150
Wood block paving 3½, 16 lb. treatment, N. Y., per sq.yd.	$2.70
Paving brick 3½x8½x4, N. Y., per 1,000 in carload lots	51.00
Paving brick 3x8½x4, N. Y., per 1,000 in carload lots	45.00
Crushed stone, ¾-in., carload lots, N. Y., per cu.yd.	1.85
Cement, Chicago consumers' net prices, without bags	2.05
Gravel, ¾-in., cu.yd., f.o.b. N. Y.	1.75
Sand, cu.yd., f.o.b. N. Y.	1.00

Old Metals—New York and Chicago

Heavy copper, cents per lb.	11.875
Light copper, cents per lb.	10.25
Heavy yellow brass, cents per lb.	7.25
Zinc, old scrap, cents per lb.	3.50
Lead, cents per lb. (heavy)	5.25
Steel car axles, Chicago, net ton	$16.25
Cast iron car wheels, Chicago, gross ton	14.25
Rails (short), Chicago, gross ton	15.50
Rails (relaying), Chicago, gross ton (65 lb. and heavier)	28.50
Machine turnings, Chicago, gross ton	7.50

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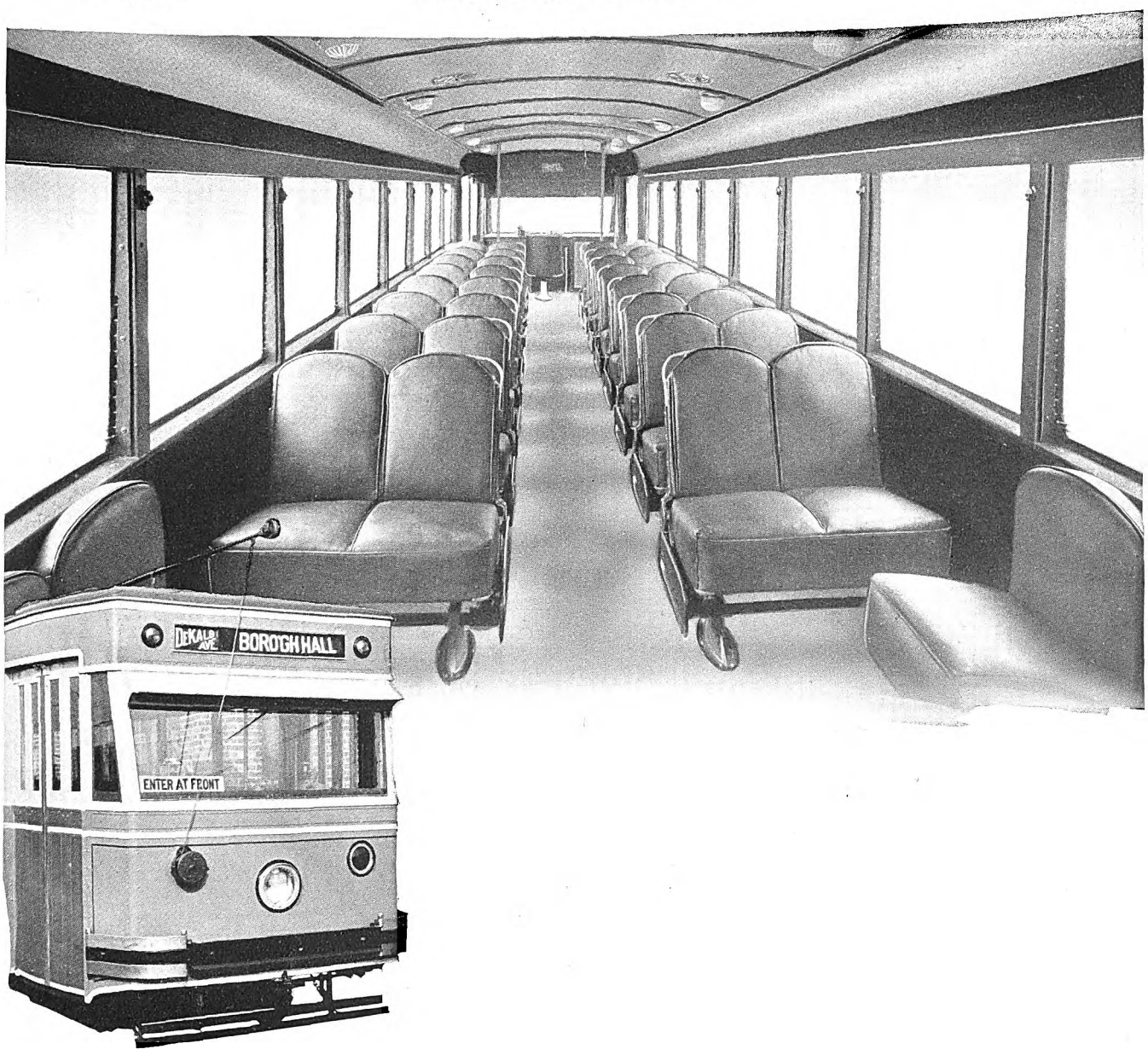

On the Inside Looking Out

Upon the first appearance of the Brill "Car for 1928" in Brooklyn, New York, the riding public expressed unanimous approval of its 42 inch single windows, eight on each side of the car. The full width windshield of plate glass in the vestibule at the front end of the car provides unobstructed vision for the operator. As this windshield slopes outward, body reflections are eliminated so that the customary curtain is not needed.

That the public appreciates this effort to provide maximum vision is apparent from these few comments which are among thousands received from Brooklyn residents—"Fine view," "Windows especially good," "Windows admit plenty of light," "Greater visibility."

This better vision feature is one of the many refinements which make the "Car for 1928" an outstanding achievement in the electric car industry.

The J. G. Brill Company, Philadelphia
American Car Company, St. Louis

The G. C. Kuhlman Car Co., Cleveland
Wason Manufacturing Co., Springfield, Mass.

BRILL "Car for 1928"

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PLYWOOD
HASKELITE
PLYMETL

HASKELITE

PLYWOOD
HASKELITE
PLYMETL

On leading Texas lines

HASKELITE and its steel-faced companion, PLYMETL, are in service on practically all the leading properties. For instance, a recent check of HASKELITE users showed nine out of the first eleven lines in Texas. Wherever light weight, strength and beauty of finish are prime requisites, HASKELITE products are favored.

Among the leading Texas lines using HASKELITE or PLYMETL, or both, are the El Paso Electric Railway Company, Galveston & Houston Electric Company, Galveston Electric Company, Northern Texas Traction Company, The Dallas Railway Company, The Texas Electric Railway Company, the Houston Electric Company, the Beaumont Traction Company and the Wichita Falls & Southern Railway Company.

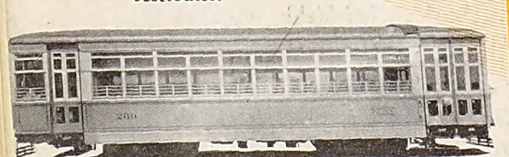
HASKELITE MANUFACTURING CORPORATION
133 West Washington Street
Chicago, Illinois

Railway Representatives:

Economy Electric Devices Co.
37 W. Van Buren St., Chicago
Grayson Bros., 600 LaSalle Bldg., St. Louis, Mo.
Railway & Power Engineering Corp.
Toronto, Ont., Canada

Exterior and interior views of Galveston Electric Co. car with HASKELITE ceilings built by the American Car Co.

Exterior and interior views of one of 10 cars built by St. Louis Car Co. for the Northern Texas Traction Co. with HASKELITE headlinings and molded vestibules.



Exterior and interior views of one of 7 cars built by American Car Co. for the El Paso Electric Co. with HASKELITE ceilings.

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ELECTRIC RAILWAY JOURNAL

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Franklin

FEB 27 1928

Railless Trolley Car

On common carriers Timken Bearings are a common practice. Railroad cars, street cars, gasoline rail cars, gas-electric locomotives and all types of buses are among the Timken-equipped conveyances for mass transportation. For this highly responsible work, Europe widely capitalizes the engineering excellence which has made Timken Bearings so familiar here. With the longest experience in anti-friction practice, Europe embraces Timken Bearings—produced in Timken Works in England and France.

THE TIMKEN ROLLER BEARING CO., CANTON, OHIO

TIMKEN *Tapered Roller* BEARINGS

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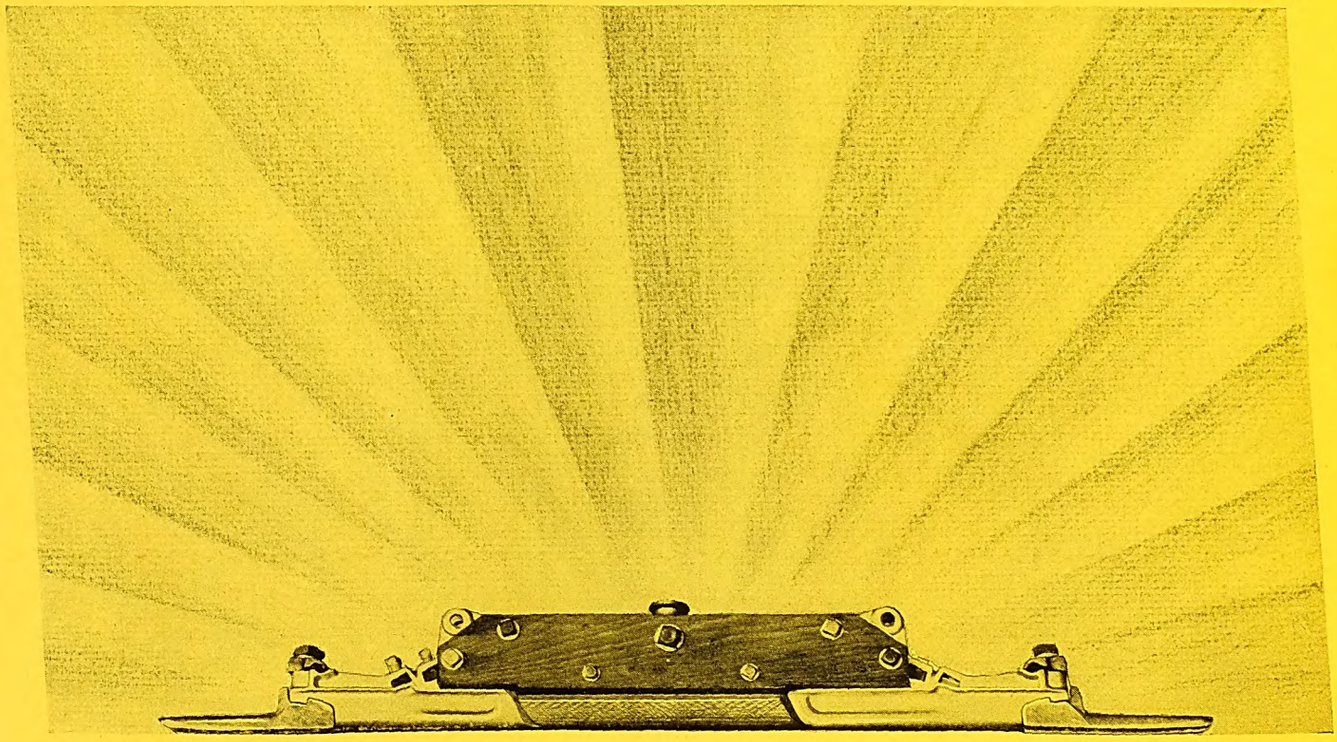

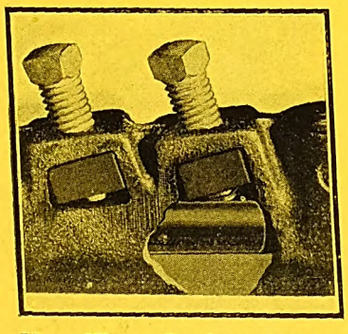

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Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review
Published by McGraw-Hill Publishing Company, Inc.
CHARLES GORDON, *Editor*

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Cause for Congratulation but Not for Rejoicing

SENATOR WALSH'S proposal for a senatorial inquiry into the public utility and closely allied corporations has been denied. Instead the Federal Trade Commission will act in the matter. While the trade commission will be under pressure, the case will be conducted along judicial lines and not along the lines of prosecution. As *Electrical World* sees it, the outcome of the matter should be an occasion for congratulation but not for rejoicing, for the desire of the commission to bring out all the facts will inevitably elicit much irrelevant, biased and misleading testimony which will be read by many who will not read that on the other side.

For three days the Senate debated, without eliciting one constructive thought or any good reason, for that matter, why there should be any investigation. During this time passion instead of reason marked the consideration of the resolution and Senator George's amendment to it. Those who sought to place the investigation in the hands of the Federal Trade Commission were accused by inference of being bought by utility money; the Trade Commission itself was charged with incompetency and said to represent "big business" only, and as for the executives and others of the utility industries involved, they were all lobbyists. Obviously, from a public utility angle the situation was anything but reassuring, and the Senate did well, in vindication of itself as well as in justice to the utilities, to turn the matter over to the Federal Trade Commission. There the complete story may be told—and the record can speak for itself.

The utility companies of this country are entitled to a fair hearing, and the submission of their case to the Federal Trade Commission would indicate that the Senate of the United States means that the utilities shall have it. When the case will end and what the final judgment is to be will be revealed in due season. The verdict should be one of exculpation and reassurance. If the case of the utilities is properly presented, no other outcome is thinkable.

Little Things That Make Friends

"WAIT FOR PASSENGERS," a wise edict of an even wiser management, issued recently during a persistent stretch of cold weather in Omaha, had telling effect as letters to the newspapers of that city testify. In this instance motormen and conductors were instructed to hold cars for those hurrying to catch them and were told that under the unusual circumstances prevailing "a few seconds lost in schedule time in this way are compensated by the appreciation the passenger shows for the friendly act." Not long before this order was issued the same railway opened a bureau to receive patrons' complaints and suggestions for the improvement of service and gave proof of its good faith by co-operating with a worthy idea—that of supplying extra railway service for the convenience of workers in a packing plant.

There are, of course, many companies with officials sufficiently progressive and far-seeing to evaluate highly the countless little acts of service and courtesy that make the patron feel the company is something more than a machine. And these little acts are bound up with the personal equation, so that if John Jones and Mary Brown benefit today and not on some future day, perhaps after a franchise ordinance has passed through its various stages, necessarily some advantage accrues to the railway. Even if the letter of the law is observed in matters of physical equipment and other details, the spirit must be present in that railway management whose chief concern is winning riders and making friends.

When the motorman who has passed up a passenger becomes to the man left waiting in the street a fiend laughing in ghoulish glee at his discomfiture, then a potential friend of the company all too often becomes irascible and articulate in his condemnation of the public servant and of the entire system. Here then is a liability that even the newly upholstered seat in the modern car can not convert into an asset. Even the request of the company to inspect new facilities may bring something of a reproach rather than approval. To bring back the esteem of persons whose friendship has been lost is far more difficult than to establish good repute in the first place, for it is infinitely easier to make friends than to convert enemies into friends.

The Railway Leads the Way in Milwaukee

CONFIDENCE in the future of electric railway transportation stands out strongly in the program of rehabilitation and improvement which the Milwaukee Electric Railway & Light Company has been resolutely pushing forward during the past several years. This company's "service first" slogan, emblazoned in gleaming electric signs, meets the eye in many locations throughout Milwaukee. But a slogan is merely a promise; one must look to more concrete things for its full significance—to the major rapid transit program undertaken to anticipate the city's needs despite public inertia; to improved city service, rehabilitated cars and track, and new equipment offering modern convenience and increased safety; to the comprehensive motor bus system, co-ordinated with the rail lines both within the city and in the surrounding territory throughout the southeastern section of Wisconsin. To these things one must look for a demonstration and interpretation of what the "service first" slogan means in Milwaukee.

It is obviously impossible to finance with private funds a complete rapid transit service for a city like Milwaukee. Nevertheless, the Milwaukee Electric Railway & Light Company has undertaken to provide a high-speed line from the center of the city to the west, connecting with

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interurban lines leading to Watertown, Burlington and East Troy. In doing this it is endeavoring to demonstrate the value of efficient public transportation. The meteoric rise in popularity of the automobile has for the moment caused the public in Milwaukee, as in many other communities, to overlook the importance of adequate rail transportation. Although heavy expenditures of public funds have been made on street and highway improvement projects, there has been no general policy of planning for mass transportation routes into and within the city. By making heavy investments of private funds to acquire rights-of-way for such routes, the Milwaukee company is endeavoring to bring about adoption of an intelligent community plan before building development in outlying sections cuts off the opportunity of providing such facilities at reasonable cost.

It would have been far easier to have permitted the interurban lines running into the city to have dried up and disappeared through neglect than to have spent millions of dollars in rebuilding and extending them as high-speed railway arteries. But the company was convinced of the value of these lines to the community. It is confident that public co-operation in working out a complete transit plan can be won by demonstrating the company's own faith in the value of rail transportation. In thus undertaking to lead the way toward a sound community transportation policy, the Milwaukee management is putting into concrete practice the promise contained in its "service first" slogan.

Chasing the Ambulance Chaser Out of Business

EFFORTS to drive ambulance chasers out of business have been renewed recently, and there is every reason to believe that they will meet with considerable success. Following closely on the heels of the successful campaign by the Lawyers Club in Milwaukee, a sweeping investigation of ambulance chasing attorneys and activities of casualty agencies has been ordered by the Supreme Court of New York.

The investigation in Milwaukee disclosed that the activities of the ambulance chasers were not only unethical but actually illegal. The courts went over their records and in many instances where there was evidence of malpractice, the cases were either thrown out or the plaintiffs were required to employ new counsel. So great was the publicity given to these proceedings that the practice now has virtually ceased to exist.

Action in New York has been taken in response to a petition of the bar associations presented by no less a person that Charles Evans Hughes, former Chief Justice of the United States Supreme Court. The petition points out that ambulance chasing lawyers have so systemized their business that they are enabled through the help of hospital employees, ambulance and taxicab drivers and others, to obtain immediate information of accidents. Claims involving large amounts have got into the control of unscrupulous lawyers who have proceeded to settle them for their own benefit rather than that of their clients. Many poor and ignorant people have been victimized. To help them to relieve court congestion, and to aid the good name of the legal profession, the New York bar associations hope to have the practice stamped out. If this is done the local transportation companies will also benefit greatly.

The investigation has already been formally opened. The Supreme Court has appointed one of its justices to conduct the inquiry and has armed him with power to summon witnesses, compel testimony, and investigate the books of attorneys and accident insurance companies. This proceeding is based on the right of the Supreme Court to exercise control over attorneys and counsellors at law. Many prominent lawyers in New York City have volunteered to give their time to further the purposes of this investigation. Owing to the well intrenched position of the ambulance chasers it is expected that the campaign against them will meet with strenuous opposition and may require as long as a year for its completion. No doubt exists, however, concerning the final outcome. In the end the practice will be stamped out as effectively in New York as it has been in Milwaukee.

Bus Fare Must Be Made Adequate to the Service

GENERALIZATIONS are always dangerous, but D. E. Druen, superintendent of bus maintenance of the Kansas City Public Service Company, was right when he said at the recent meeting of the Midwest Electric Railway Association that the average fare now charged on bus operation throughout the country is not only inadequate but is not consistent with the value received. He was also right when he said that a fixed fare is not in keeping with the flexibility of bus operation and will surely work a hardship on both the public and the operator. These points cannot be reiterated too often. There is no disposition at this time to go into the economics of the matter. Neither is there any disposition to upbraid the electric railways for errors of the past. It is to be expected that in a development of this kind conditions arise over which management has little control. The important point now is that past errors should be avoided, particularly in pending franchise negotiations in which the use of the bus seems likely to play a large part.

As pointed out in the JOURNAL for Feb. 11, the fixed fare was always an anomaly, but particularly so in the case of the bus.

Often the presence of jitney competition or the threat of independent bus operation by groups with more enthusiasm than actual knowledge of bus economies, forced the railways to install buses at rates of fare known to be insufficient. The real difficulty in such situations is caused by the inertia of the public mind once a rate of fare has been set. For that reason it is particularly important that the danger of fixed fares be emphasized at every opportunity. As operating experience grows, inadequate fares prove a serious burden to taking full advantage of the new vehicle. It is inevitable where there is an inadequate fare that the service should seek the level of the fare.

Bus operation by the railways has not been more uniformly successful because too much has been attempted. The place of the bus physically under railway auspices has been pretty definitely defined, but there is need for greater insistence on the right to adjust fares to particular conditions, with a reservation of a variable fare consistent with the nature of the service furnished and its class. And in all this discussion the place of the bus in de luxe city and suburban service should not be overlooked. These are merely some considerations that will help to put an end to the period of trial and error with the bus from the standpoint of the ability of that vehicle to pay its way.

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Will the Public Pay for Good Transportation?

RECENTLY the Port of New York Authority took a "commuter census" of inbound railway traffic from Long Island, Westchester County and Staten Island into New York City as a step toward planning better transportation in the metropolitan area. Although too early at this time to report on the figures of this survey, it is expected that further evidence will be found that commuters are willing to pay higher fares for better service.

Any such evidence will strengthen the "better service" theory revealed by a similar census taken two years ago by the North Jersey Transit Commission. Figures from the questionnaires returned at that time showed that 57 per cent of the passengers arriving at one terminus pay from 6 to 10 cents extra fare on the Hudson & Manhattan tubes when they could have traveled without extra charge on the ferries. For what did they make the extra expenditure? The question is answered in two words—better service—which, as the New York *Herald-Tribune* remarked, "is an interesting commentary on the dogma that the public won't pay a cent or two extra for good service."

Experience with Upper Decks on Cars and Buses Should Not Differ Greatly

UPPER decks on buses have largely the same advantages and disadvantages as those on electric cars. There is every reason to believe that, relatively speaking, the use of double-deck buses will decrease.

Where transportation for pleasure is not involved, experience has shown that the single decker is superior in many respects. The principal claim for the double-deck type is large seating capacity. However, the space limitations made it impossible to include entrances and stairways of sufficient width and with low enough pitch to make access easy and loading and unloading rapid. Where stops are frequent and there is any considerable passenger interchange, the standing time is increased seriously and the schedule speed is reduced. Further, the standing vehicles in the street increase the traffic congestion. From the traffic standpoint no really satisfactory one-man double-deck vehicle, either car or bus, has yet been designed.

Where sightseeing is a considerable part of the service, with passengers riding for long distances and desiring a good vantage point above the traffic, there are more reasons for the use of the upper deck. Still another use is on a very heavy traffic route, such as ordinarily would call for two-car trains on a street railway. If relatively few stops were made, as in express service, the double-deck vehicle would not be at such a disadvantage, as operating expenses per seat-mile could be held down.

The latest city in this country to go to single-deck design for its buses is Atlanta. The cost per bus-mile with the original double-deckers was so high that the base service is now being given with much lighter, one-man single-deck buses. The double-deckers are used in special and rush-hour service only.

In Europe, outside of Great Britain, the single-deck bus, like the single-deck car, is the rule. The principal exception is in Berlin, where double-deck buses are employed along with single-deck cars, although in Berlin, as in New York, the bus service is small as compared with that given with surface cars.

In several of the largest cities in this country, such as New York, Chicago, St. Louis and Philadelphia, double-deck buses still are used in large number. But for general service, at least in the smaller cities, the single-deck bus offers the opportunity of a lighter vehicle, one-man operation, fewer passengers per bus, fewer stops, and more frequent service.

If Theory and Practice Could Be Brought Into Accord

ONE does not have to agree with all that the Maryland Commission said in its recent fare decision in the Baltimore case to realize that its suggestions about the advisability of revamping the financial structure of the United Railways & Electric Company have merit. The question is how best to do it. There is no doubt that the fare change authorized, although it fell short of what the company desired, will help toward restoring the credit of the company, but no fare change that could be made is a panacea sufficient by and of itself to correct a condition in a financial structure that appears to be inherently clumsy.

Naturally, the commission frowned on the idea of a forced receivership. How the proponents of this idea thought receivership could be forced or what they thought could be gained by it, almost passes understanding. Rightly, the commission held that any such proceeding would mean no good, but only harm for the car rider. The United Railways is anything but insolvent, and the property cannot be confiscated. Until recently the company has been able to pay dividends.

Theoretically the amount of securities which the company has outstanding has nothing to do with the matter, since the value has been fixed upon which the company is permitted to earn a return and the commission has attempted to set a fare that will permit the company to earn on it. Practically, however, it has a very important bearing, particularly on the basis of the relative percentage of one form of securities to another. As the matter stands now, the company has outstanding securities in par value $12,637,000 in excess of the value fixed by the commission, but in the ratio of funded debt to total capitalization and to value upon which the company is permitted to earn lies the most potent factor at work against the company. The first ratio is approximately 76 per cent, while the ratio of funded debt to the value of the property found by the commission is approximately 90 per cent. The commission believes that the ratio of funded debt to the stock ought not to be greater than 67 to 33 in a company of this sort. Such a structure would of course be fairly comparable to that suggested by the committee of finance of the A.E.R.A. Standing in the way of further financing at reasonable terms to the United Railways is a closed mortgage. In consequence the company has resorted to securing money through the Maryland Electric Railway, which leases its property to the United for a sum sufficient to pay interest on the bonds and provide for their retirement at maturity.

The presentation of the matter in the commission's findings is very interesting. The management at Baltimore may be assumed to be no less cognizant than the commission of the theoretical considerations that ought to be made to apply to this case. Matters for them would be helped greatly if things could be so readjusted as to bring about an approximation of the real and the theoretical considerations.

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The high-speed lines that are being developed north, west and south from Milwaukee center in the Public Service Building

Service First

Is Milwaukee's Transportation Slogan

PART I

By Charles Gordon

The Milwaukee Electric Railway & Light Company is making heavy investments in improved facilities to anticipate the transportation needs of its community. Adequate high-speed service is considered vital to the city's present and future development

IT IS more than probable that a full realization of what its transportation company's foresight is doing for the progress and future prosperity of Milwaukee, will not be fully recognized for many years to come. That foresight is being backed with the courage to make large investments in improved transportation facilities within the city and in anticipating the community's expansion and future needs. While many cities in the country are wrestling with the problem of providing fast and adequate public transportation, the lack of which is threatening to stifle their development, the Milwaukee Electric Railway & Light Company is taking the initiative in providing for Milwaukee the backbone for a comprehensive rapid transportation system for the city and contiguous territory.

Millions of dollars have been expended in providing rights-of-way for the conversion of former interurban lines into grade-separated, high-speed, rapid transit lines that constitute arteries for the expansion of the city and for linking the present city area with the prosperous and attractive surrounding communities and countryside that are logically within the Milwaukee metropolitan district. Milwaukee's transportation company is looking ahead to the part which these attractive suburban towns and the land of lakes that surrounds the city proper may be expected to play in the development of a greater city. It is anticipating, likewise, the needs of the growing industrial district that lies to the south. On the railway lines within the city heavy expenditures have been made during the past several years for improved street cars and for putting surface track in good condition. There has been built up a comprehensive bus service both within the city and between Milwaukee and other communities in the south-

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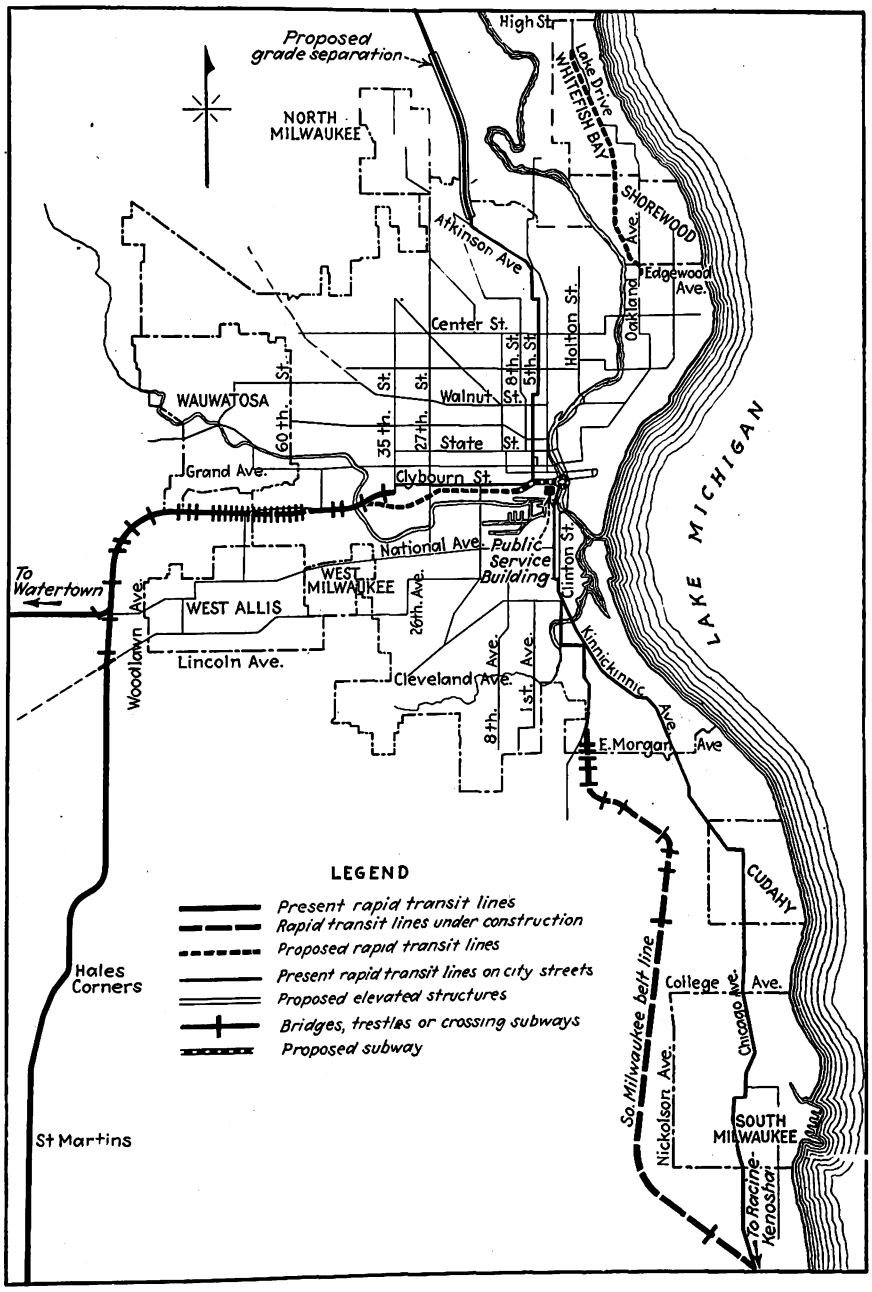
eastern section of the state. All this is being done in the face of public inertia and despite a discouraging financial showing on present transportation operations.

Although Milwaukee County has been liberal in the expenditure of public money for highway improvements, continued increase in road congestion threatens to choke off the city's activities just as growing congestion is doing in practically every large city in the country. Though both the city and county of Milwaukee have a progressive zoning and planning policy looking to future growth and expansion, there has been a tendency, just as there has been in other cities, to overlook the importance of making adequate provision for rapid public transportation. Blinded by the popularity of the automobile, public planning bodies in Milwaukee have failed to recognize the futility of depending upon highway construction for a growing city's transportation requirements.

Milwaukee is fortunate, however, in that its transportation company has had the foresight and courage to go ahead on its own initiative and at its own expense, to provide for present needs and to reserve other important transit routes before the city's growth makes this extremely costly, if not impossible. The company is leading the way in the hope of bringing about ultimately the adoption of a sounder community policy toward transportation. It is proceeding with the construction of rapid transit lines on a scale sufficient to demonstrate the advantages of rapid transportation to the public in the hope that this will win the necessary public co-operation to make a city-wide system possible.



Map of Milwaukee's city and rapid transit lines. A right-of-way is being acquired to bring the western line to the Public Service Building. Improvements on the north and south routes will insure high-speed service

Extensive construction work is under way both west and south of the city and is awaiting only final approval of plans for starting grade separation to the north. The program has been developed as part of a comprehensive plan to cover the transportation needs of the entire Milwaukee metropolitan district. The first stage of construction is to provide adequate high-speed outlets for the city's population so as to make available for residential sites the attractive surrounding countryside, which, due to the time required to reach the heart of the city, has hitherto been unavailable for all-year residential purposes. There has already been expended nearly $5,000,000 in this work. It will take additional heavy expenditures to complete the work now contemplated, and all of this is only the first step in a major program, which, if the city extends the degree of co-operation needed to work out the full plan, will give Milwaukee a comprehensive rapid transit system leading in three directions from the heart of the city through its suburbs to high-speed rehabilitated interurban lines serving outlying cities and towns within a great semicircle of 30 or 40 miles radius. From rail heads in these cities there is now a network of luxurious bus lines on the highways throughout the southeastern section of the state.

The program being carried out in Milwaukee with respect to the development of former interurban routes into rapid transit lines is of major magnitude and is in striking contrast to that followed with respect to interurban lines in other locations, particularly those which radiate out from a city into surrounding territory. There has been a general tendency to permit such lines to dry up with neglect. It would have required far less courage and risk to have permitted this to happen to the interurbans operating out of Milwaukee, for their revenues had dropped to discouraging proportions. As they wound their way haltingly over tortuous track they, like similar lines in other sections of the country, were hopelessly at a disadvantage in competition with fleet and attractive automobiles. There would have been ample justification for permitting these lines, which at one time

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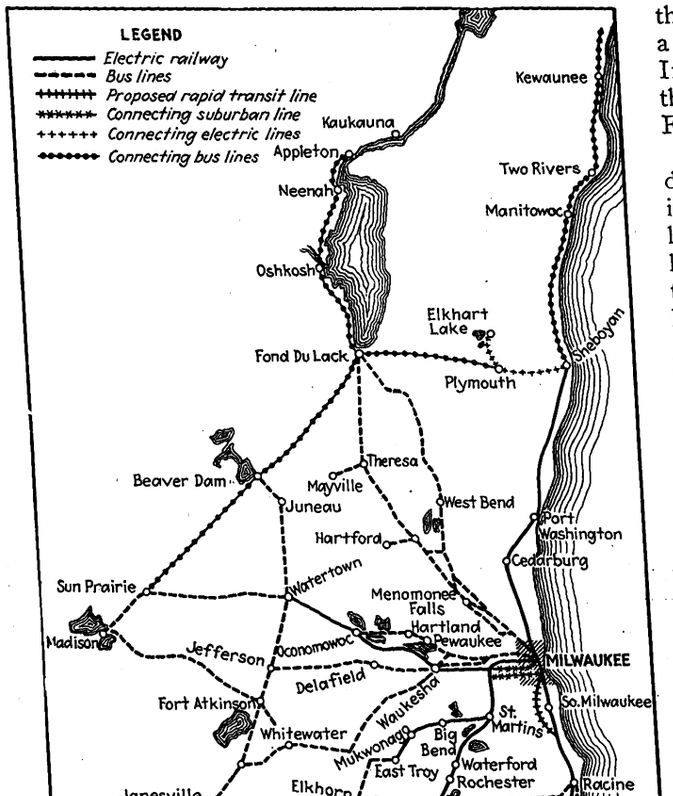


Lines of the Milwaukee Electric Railway & Light Company, Milwaukee Northern Railway and Wisconsin Motor Bus Lines serve the entire southeastern section of Wisconsin

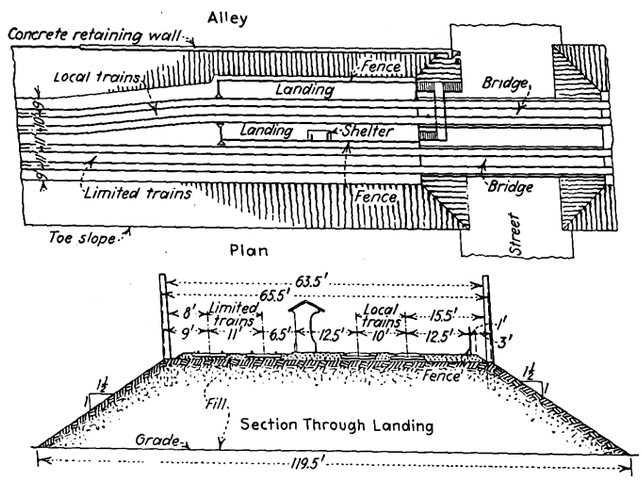
played so important a part in the development of Milwaukee, to have eked out a miserable existence until their abandonment was ultimately authorized on the basis of lack of patronage. This would have been the easiest course for the management to have pursued. The growing use of automobiles would have been adequate explanation for the demise of the lines. There would have been adequate precedent for such a policy in that followed with respect to interurbans in other locations. But the Milwaukee Company did not choose to follow such a policy. It took real courage to follow the one adopted. If the public ever really understands the full value of this program to the city, the management's "Service First" slogan will take on new significance.

So much, then, for the background of what is being done in Milwaukee. The actual construction work which is completed, under way or authorized, will bring the lines from Watertown, East Troy and Burlington, located west and southwest from the city, into a downtown terminal in the Public Service Building over a high-speed, grade-separated, private right-of-way to a point within a few blocks of the terminal, and thence through a short subway into the terminal itself. A loop is to be constructed under adjacent property owned by the company so as to provide terminal facilities ample to turn trains around without stub-ending and to avoid terminal congestion.

The first step in the construction of this western rapid transit line was the building of a line on private right-of-way from 35th Street west to West Junction, connecting with the Watertown interurban line. This work, together with a connecting line about a mile long between West Junction and the Burlington line, which was described in the June 18, 1927, issue of ELECTRIC RAILWAY JOURNAL, involved long bridges, high embankments, deep cuts and expensive trestle and bridge work. All of the construction from 35th Street west has been completed with the exception of a stretch from Soldiers Home to 70th Street. When this is completed, cars from Watertown, East Troy and Burlington will be brought 6 miles into the city on high-speed line with no grade crossings.

The construction work which is now under way from Soldiers Home west to 70th Street consists of track relocation on private right-of-way, grade separation at all important intersecting streets, and closing unimportant streets and alleys crossing the right-of-way. East of Hawley Road a depression starts which passes under Hawley Road and 60th Street, emerging at grade between 61st and 62nd Streets. From this point the line becomes elevated as it continues west, and finally connects with the present completed embankment structure now located west of 70th Street. This section between Soldiers Home and 70th Street will provide a four-track, grade-separated line, two tracks being for local service of the Wells-West Allis car line, and two tracks for high-speed express operation. The construction involves the moving of 100,000 yards of material for cuts and fills. West of Hawley Road the line is built on solid embankment with steel deck and through girder bridges over street crossings. Where the line passes under streets in cuts, concrete bridges are used to provide grade separation.

High operating speed with adequate safety is the primary object in all new construction and rehabilitation work. Heavier rail has been put in on the Watertown interurban line which connects with the rapid transit line at West Junction and extends to Watertown on private right-of-way. All 56-lb. rail was replaced with 80-lb. steel. The line has also been reballasted with crushed stone and gravel which will ultimately be all stone to insure alignment and freedom from frost trouble. A reballasting program is likewise being undertaken on the East Troy and Burlington interurban line, which, instead of having a tortuous entrance to the city over city streets, was connected to the rapid transit line last spring by the new cut-off mentioned above. New terminal stations



Typical section and plan of station landing showing type of construction on western rapid transit line to Watertown, East Troy and Burlington. These are taken between Hawley Road and 68th Street, where the last link in the line west of 35th Street is now being completed

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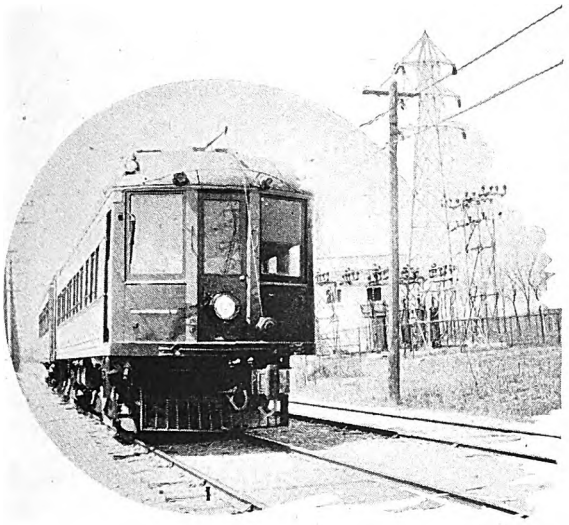


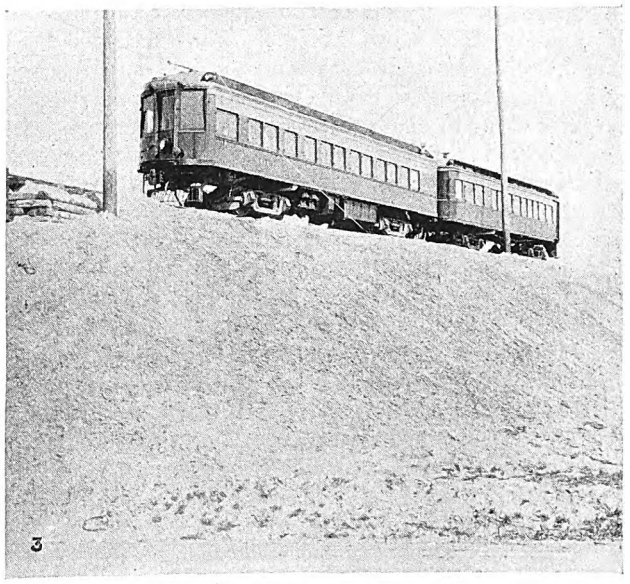
have been built in Watertown, Burlington and East Troy. These are arranged so that passengers can transfer directly under cover between buses and cars.

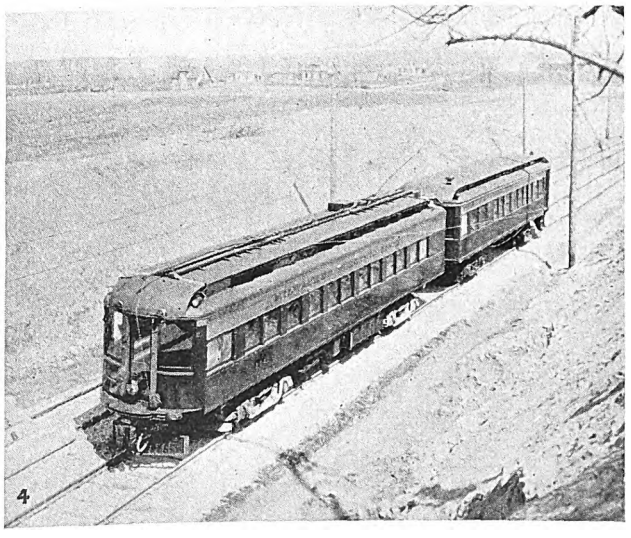
To complete the western rapid transit line from 35th Street east into the Milwaukee Public Service Building, property has been purchased to a point within a short distance of the terminal. Application is being made for permission to build a short subway to complete the connection which will give Milwaukee a complete rapid transit outlet from the city to the west and southwest. The final stage of construction awaits only completion of negotiations with the city and Railroad Commission.

South from the city there is under way the construction of a belt line around South Milwaukee and Cudahy, approximately 10½ miles long from Howell Avenue and Wieben Street to the Ryan Road crossing on the interurban line to Racine. A 3-mile industrial electric railway from the Chicago, Milwaukee, St. Paul and Pacific Railroad to the Lakeside power plant is also under construction south of the city.

This southern belt line will cut out the present slow running section of the Milwaukee-Racine railway along the highway and in the streets through South Milwaukee and Cudahy. It is estimated that this improvement will decrease the present running time to Racine by approximately thirty minutes. The belt line will consist of about 1½ miles of double track south from Howell Avenue together with a double-track running siding about midway on the line. The balance of the construction will be single track.

The double-track section will be elevated or depressed from grade on private right-of-way with steel bridges for highway crossings. The single-track part of the line will be at grade on private right-of-way and will be depressed under the Chicago Avenue crossing. Wherever practicable, on the remaining line, highways will be elevated over the track on highway bridges. The elevated section of the line will be on solid embankment. It will require eight steel bridges for the section from the beginning of the private right-of-way southbound, to the depression under Chicago Avenue. The track will be laid with 100-lb. A.R.A.-A rail, with continuous joints, heat-treated bolts and tie plates throughout. The entire line will be rock ballasted and will be laid on cedar ties on tangent track with creosoted oak ties on curves. Adequate provision will be made for future local station platforms and waiting shelters at car stop intervals of about one mile.





Construction on the Rapid Transit Line to Watertown is designed for high speed operation

No. 1. Train passing Waukeshaw Gravel Pit substation.

No. 2. Right-of-way under concrete bridge at Soldiers' Home road.

No. 3. Typical solid fill embankment.

No. 4. Cut at Greenfield Avenue looking north.

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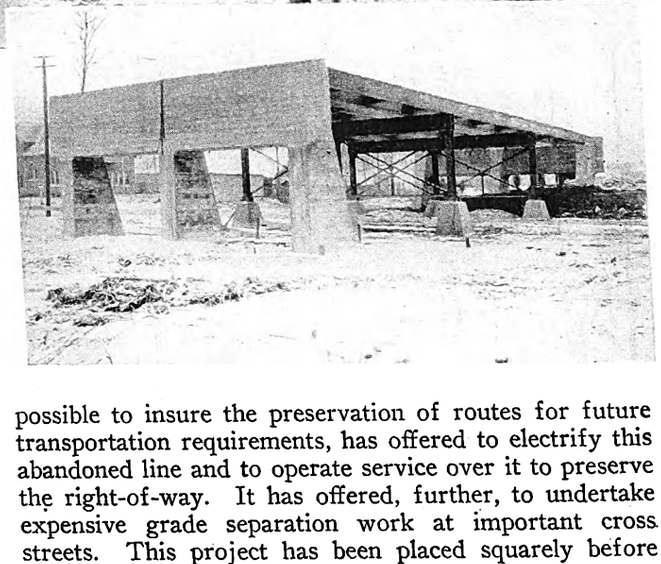
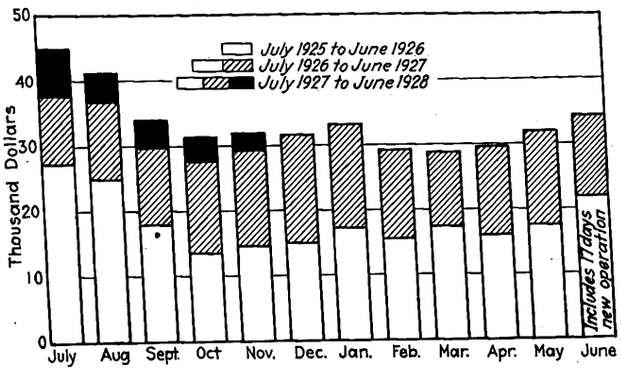


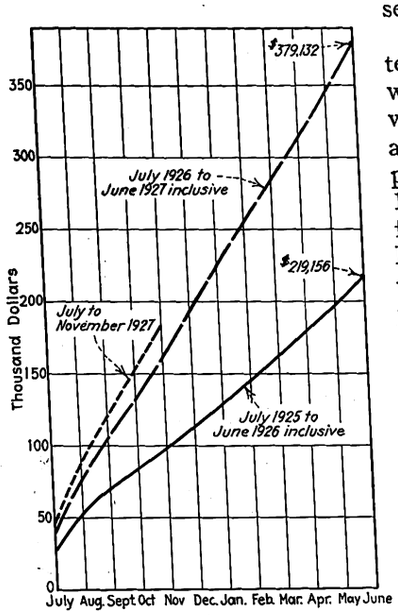
Steel bridges are being provided over all principal street crossings on Milwaukee Rapid Transit Line. Construction shown is on new work between Soldiers' Home and 70th Street

To the north of the city steps are under way to insure an outlet for Milwaukee's future rapid transit system over the present Milwaukee Northern line, which now comes into the outskirts of the city on a double-track private right-of-way and reaches the heart of the city over city streets. Work projected for the immediate future involves extensive grade separation made necessary by the expansion of the city to the north, which has taken in additional territory that has been plotted for subdivision and home construction. Plans for this subdivision work would have relegated the rail lines now on private right-of-way to a position in the center of a public street. For that reason immediate expenditures for grade separation work are to be undertaken in order to preserve a high-speed outlet to the north. The work which will be done immediately includes about 3 miles of combined track depression and elevation to give grade separation. Application has been made to the State Railroad Commission for approval of this work, and conferences are being held with county and city officials to agree upon a final plan that will be satisfactory.

Another example of the Milwaukee company's progressive policy in making every possible effort to anticipate the city's needs in transportation is afforded by the plan proposed in the northeast section of the city, in a very high grade residential district. Here a line of the Northwestern Railroad, part of its Manitowoc division running through the towns of Shorewood, Whitefish Bay and the southern end of Fox Point, is to be abandoned through an agreement with the villages. Abandonment of the railroad would cause some titles on the right-of-way to revert, and would result in cutting off this available route for present and future transportation.

Realizing that if this is permitted to occur, these communities would cut themselves off from all possibility of rapid transportation to the center of the city, the company, in accordance with its policy of doing everything possible to insure the preservation of routes for future transportation requirements, has offered to electrify this abandoned line and to operate service over it to preserve the right-of-way. It has offered, further, to undertake expensive grade separation work at important cross streets. This project has been placed squarely before the officials of the communities involved.





Improved service on the Watertown line almost doubled the riding the first year. The second year's operation is showing further increases

High-Speed Cars Provided

The conversion of old interurban lines running out of Milwaukee into a network of high-speed lines serving the entire metropolitan area surrounding the city and outlying sections tributary to it, has been accompanied by improvements in rolling stock in keeping with the changed standards of operation. The rapid spread of competing interurban bus lines and the increased competition of the private automobile led to the conclusion that the interurban lines under the old operating standards were either doomed to early abandonment or that they must be promptly brought to a new standard of service and comfort.

Improvement of interurban equipment was started in 1922 with changes in seats and experiments with parlor car service. In 1924-1925, seven cars for the Milwaukee-Racine-Kenosha line were rebuilt with improved seating, and four cars were converted for parlor car service. With the introduction of parlor cars, limited service was started. This soon gave evidence of the advantages of increased speed, but quickly showed the limitations of street running and the cross-

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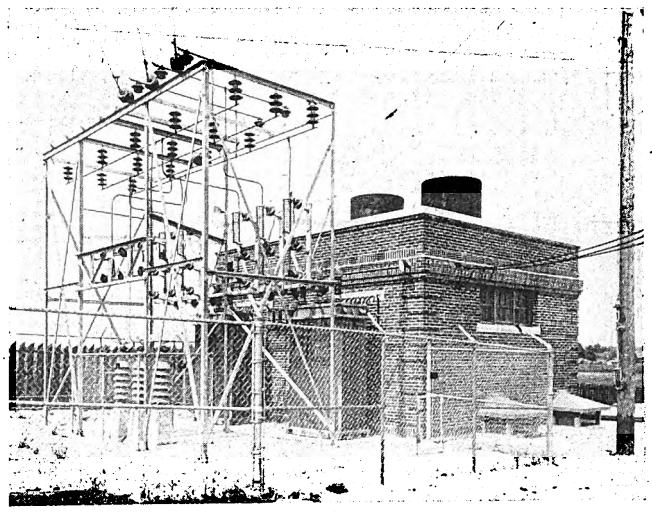
ing of many streets and highways at grade. It was this early experience in the effort to give a better service out of Milwaukee that ultimately led to the present major program of building high-speed lines on private rights-of-way with equipment designed to permit fast running with comfort and safety to passengers.

A number of existing interurban cars that had the necessary structural strength were rebuilt for the new service. They were completely refurnished and equipped with new trucks and motors suitable for high-speed running, and with multiple-unit control and modern air brake equipment to permit the operation of more than one motor car in a train. In all, 31 motor cars and ten trailers have been rebuilt for high-speed rapid transit service, and four entirely new motor cars have been purchased. A new articulated unit for service on the Milwaukee-Watertown line has been built in the company's shop. This is a combination dining car, passenger unit with two bodies and three trucks, providing communication between the dining and passenger compartments. It was placed in service between Milwaukee and Watertown, on Jan. 16, and makes direct connections at Watertown with parlor coaches to Madison, the state capital.

The rebuilding of interurban cars consisted of reinforcement of the bodies, insulation against noise, improvement of the lines and general appearance, new interior finish, installation of improved lighting equipment and de luxe leather upholstered bucket type air-cushioned seats. New standard steel, M.C.B. trucks of 7-ft. wheelbase, in which special attention was given to riding qualities, were purchased. Old GE-205 motors were replaced with GE-254, 140-hp. motors and Westinghouse 548, 105-hp. motors. The gear ratios and field control that are provided permit operation with a trailer at free running speeds of 60 m.p.h. M.C.B. couplers and A.M.U. air brakes are used.

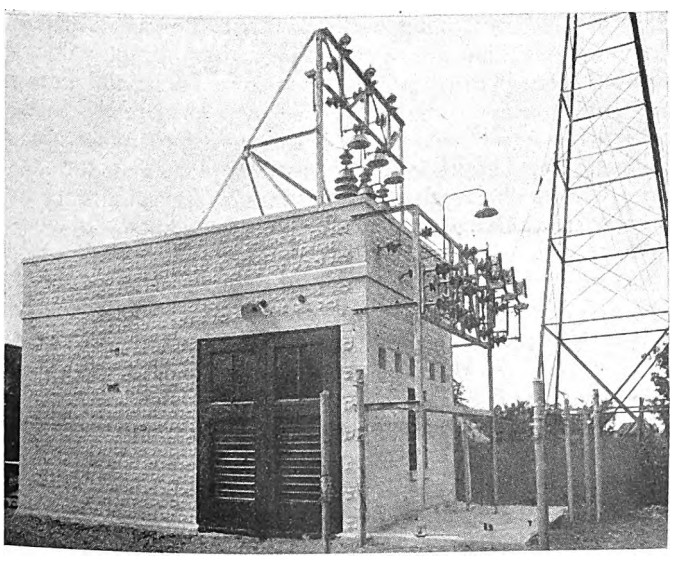
Before the rehabilitation of the lines to Watertown, Burlington and East Troy, operation had been on 1,200 volts direct current from manual substations located at West Allis, Waukesha, Waukesha Beach and Watertown on the Watertown line, and at Burlington and East Troy on the Burlington and East Troy lines. There were substations only at the ends of these three divisions, with intermediate stations on the Watertown line at Waukesha and Waukesha Beach. The West Allis station fed to all three lines from a common point near their entrance to the city.

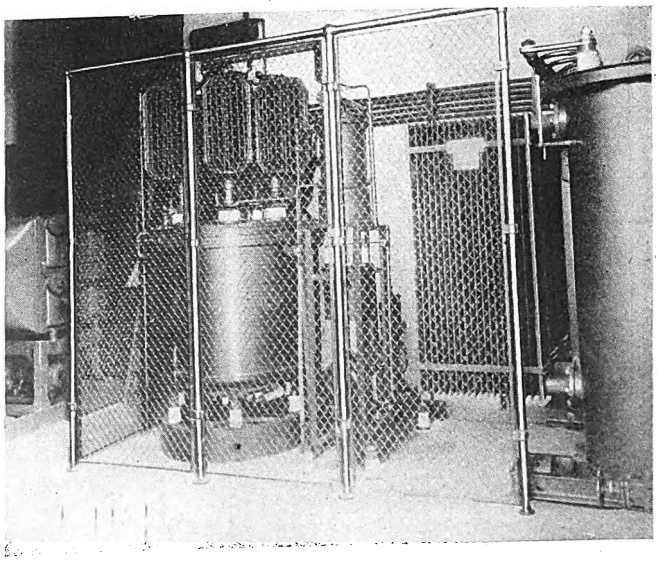


The St. Martins rotary substation is a two-unit installation with full automatic control

The new power supply is 600-volt direct current from substations, spaced at frequent intervals to insure adequate trolley voltage with minimum line drop for high-speed trains. The former 1,200-volt substation at West Allis was converted to 600-volt operation and contains one 2,000-kw. rotary, one 1,000-kw. machine and one of 500-kw. capacity. This station is manually operated and feeds both to the Watertown line and the Burlington-East Troy line from a point in the outskirts of the city near the junction point of these routes. The power supply is from the high-tension transmission lines of T.M.E.R. & L. Co., some of which use the railway rights-of-way for power transmission to points in the state west and southwest of Milwaukee. At West Allis the railway power supply is received at 66,000 volts, 25 cycles. This same condition exists at the other old stations which have been changed over from 1,200 to 600-volt operation; namely Waukesha, Waukesha Beach, Watertown and at stations on the Burlington-East Troy line.

The Waukesha station on the Watertown line is a full automatic station with two 500-kw. Westinghouse,





Three of the new substations on the Watertown Line are equipped with mercury arc rectifiers. The exterior of the Nemahbin and interior of Pipersville stations are shown

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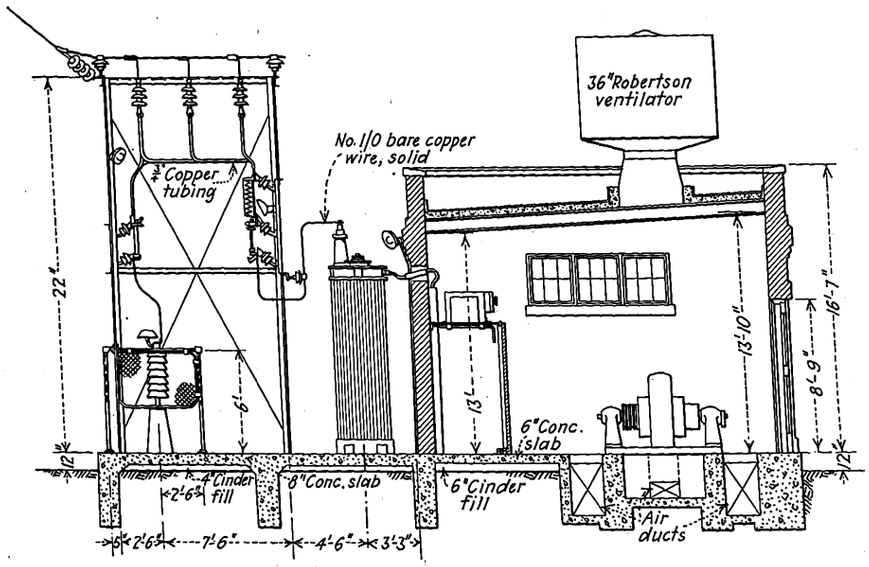

Section through typical new automatic rotary substation. This drawing shows arrangement of St. Martins, two-unit station

25-cycle rotaries and Westinghouse automatic control equipment. The next station on this line, Waukesha Beach, is a manual station with three 500-kw., 25-cycle G.E. rotaries. The next three stations on the Watertown line, namely Nemahbin, Oconomowoc and Pipersville, are all mercury arc stations with automatic control, each containing one 550-kw. Brown Boveri mercury arc rectifier. Simple and compact concrete block buildings house these stations, which have outdoor switching equipment. An interesting feature of the installations is the recirculation of cooling water, using fan cooling, due to the lack of a water supply for cooling the rectifier units. The general appearance and arrangement of these stations is shown in accompanying illustrations. The last station on the Watertown line is at the terminal. This again is a converted, former 1,200-volt station and contains four 300-kw. 25-cycle G.E. rotaries operated manually.

On the Burlington-East Troy line, a new full automatic substation was built at the junction point of the Burlington and the East Troy divisions at St. Martins. This station contains two 500-kw. Westinghouse rotaries with Westinghouse control equipment. From this point on the Burlington division, new stations were built at Wind Lake and at Waterford. Each of these contains one 500-kw. G.E. rotary with Westinghouse full automatic control. At the end of the Burlington division the Burlington station, which was converted from 1,200-volt operation, is manually operated and contains three 500-kw., 25-cycle G.E. rotaries.

Leaving St. Martins on the East Troy division, there are two new automatic stations of similar design at Chamberlain and Mukwonago respectively, each containing one 500-kw. Westinghouse rotary with Westinghouse control equipment. At East Troy the station was formerly operated at 1,200 volts. It has been converted to deliver trolley current at 600 volts, and contains two 300-kw., 25-cycle G.E. rotaries with full G.E. automatic control equipment, and two 300-kw., 25-cycle G.E. machines operated manually.

The two-unit automatic substation at St. Martins is typical of the type of construction used for the new rotary stations. As shown in an accompanying illustration the building is of simple design in pressed brick, with one large central door. On the interior, a slate panel switchboard occupies practically the entire wall opposite the door. This carries the conventional equipment of meters and automatic control relays. Two 500-kva., three to six-phase transformers are located outside the building. Here also, are grouped a bank of auto valve lightning arresters, the disconnects, fuses, choke coils and framework for the high-tension circuits. All the outdoor apparatus is inclosed with a sturdy cyclone wire fence. Several light units are mounted at different levels on the switch framework to provide illumination for emergency night work.

A number of windows placed in either end of the station admit light, but circulation of air for ventilation is cared for by special air inlets and two 36-in. Robertson ventilators on the roof. Particular consideration was given to the problem of circulating cool air through the rotaries. For each machine two ducts bring in air from the outside near the ground level of the building and deliver it to the machines through gratings directly alongside the bearing pedestals. Protective horizontal hoods and fine screens completely covering the three exposed sides of the air inlets shield them from surface dirt, rodents, etc. Another set of gratings located in the station floor in line with the field frame, serve as vents to prevent trapping of hot air in the frame pits. In general, the trolley wires are paralleled by 500,000-cir.mil copper or equivalent aluminum auxiliary feeders.

All single track on the Watertown line, on the Southern Belt line and on the Milwaukee Northern line, is protected by Nachod block signals. Similar protection is provided on the Burlington-East Troy line south to St. Martins. At all important highway crossings on the interurban lines of the company, there have been installed either wigwag or flashing light type of highway crossing protection signals.

The Milwaukee company's "service first" slogan as reflected by improvements in city service and the development of a comprehensive co-ordinated bus service will be discussed next week.

Comfortable seats, easy riding at high speeds and cheerful illumination feature the cars used on the rapid transit lines out of Milwaukee

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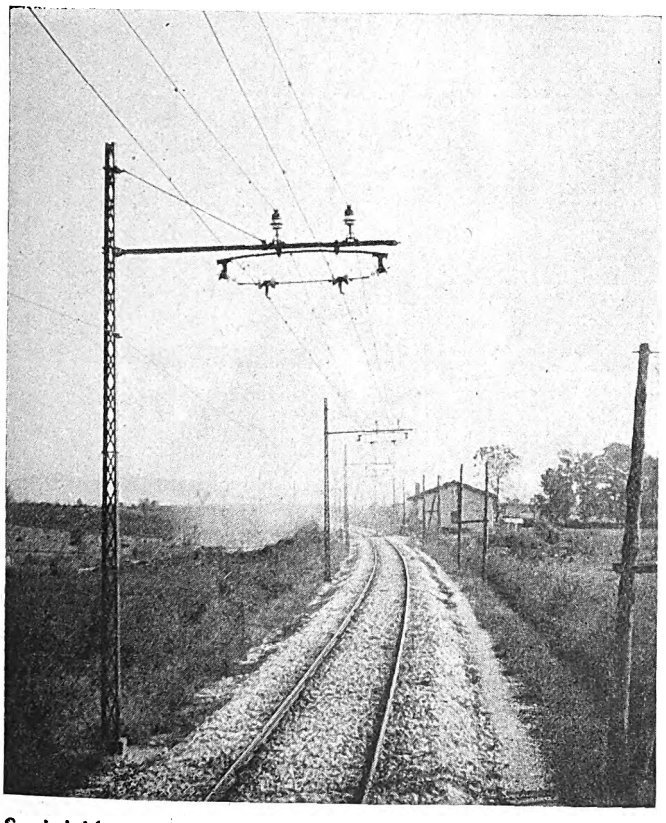
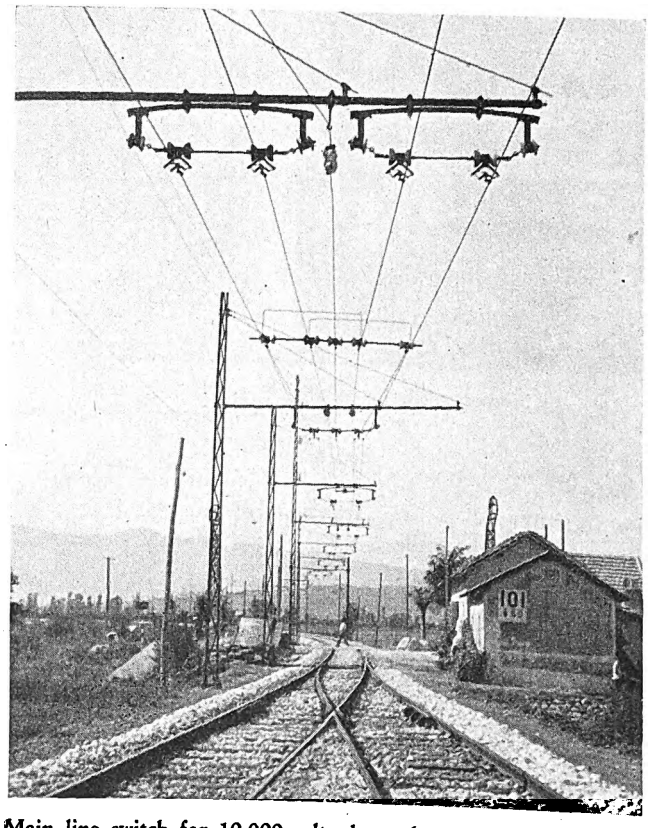
High-Voltage A. C. System in Italy

Three-phase alternating current at 42 cycles and 10,000 volts between the two overhead contact conductors employed by the Italian State Railways on an experimental line

By Kent T. Healy
Research Associate Yale University, New Haven, Conn.



Semi-rigid ears fastened to insulators on a transverse rod support the contact wires on curves



Main line switch for 10,000-volt, three-phase distribution system of the Italian State Railways

CERTAIN conversion disadvantages of the low-voltage three-phase system have caused the Italian State Railways to experiment with two new systems of electrification. The first of these, high-tension direct-current, is being tried near Naples. The second, a three-phase alternating current system at a frequency of 42 cycles and 10,000 volts between the two contact line conductors over each track, is being tested on the 107-mile line from Rome to Sulmona. This article treats of the construction of the second-named experimental system of electrification. It had not been put in operation at the time of the writer's visit to the property last October.

Energy is received at 60,000 volts and stepped down to 10,000 volts at the substations for distribution. Use of the higher voltage and frequency demanded a different type of locomotive.

The substations are of the indoor type with one room for high-voltage switches, another for the transformers and a third for feeder switches. The transformer equipment includes six 800-kva. single-phase units and one spare. They are protected by an unusual number of choke coils, which are shown in an accompanying illustration. The feeder switches are of a truck type of high capacity.

Four Types of Overhead

The contact system is interesting in that four types of construction are used. The simplest consists of two No. 0000 copper conductors, directly supported from brackets at 100-ft. intervals by hard-spot eliminating ears. It is used in the yards, at the stations and on some sections of the main line where speeds are restricted. One of the illustrations shows the use of this type in the yards.

For heavy grade sections of the main line a second pair of feeder conductors is added. The insulation used is below the American electric railway standards for the voltage used and the sectionalization switches, as illustrated, are very close together for horn gap switches. The third type of contact system is the usual catenary with a copper messenger supported by pin insulators and a copper contact wire, pulled to either side by a Hewlett type

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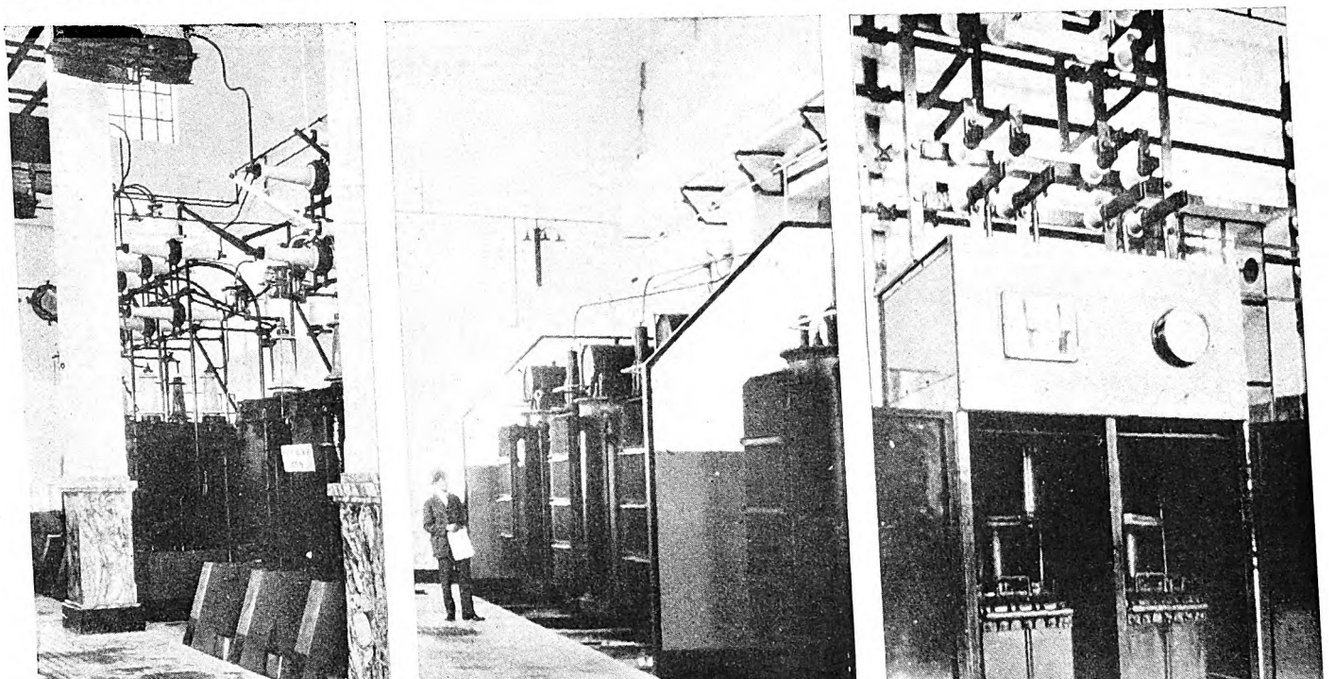
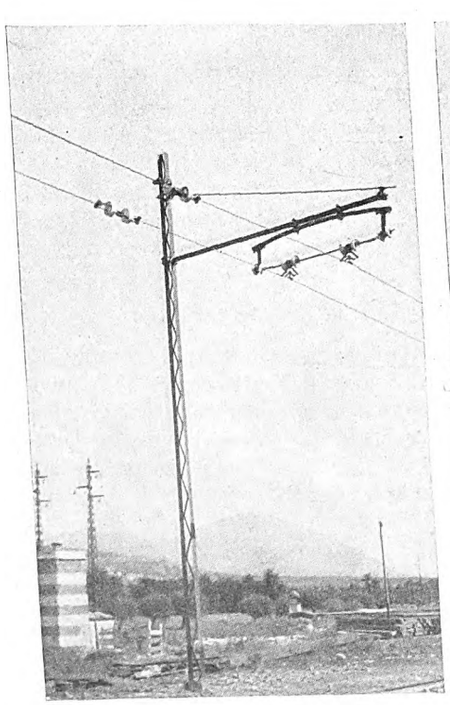


Numerous choke coils in the 60,000-volt switchroom protect the transformers. Portion of transformer room, showing barriers. Three-phase feeder switch for 10,000-volt service

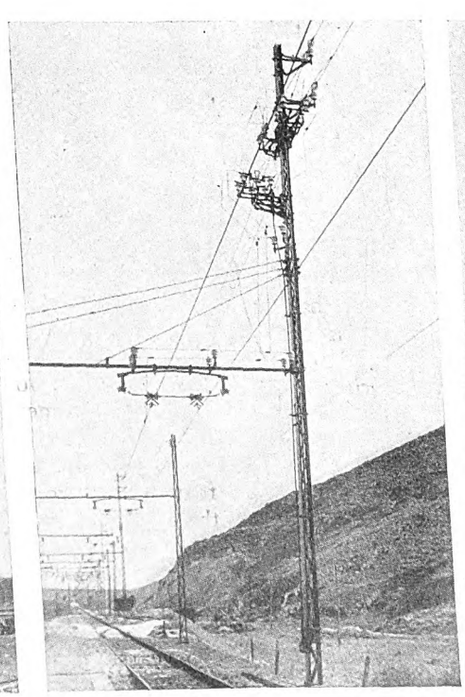
insulator, in series with a special through type insulator. The fourth type of support is a catenary with a messenger on pin insulators and the contact wire pulled off by semi-rigid ears fastened to through insulators on a transverse rod.

Switches are all made with direct suspension whether in main line or yard service because the addition of a catenary messenger would complicate the construction, making it difficult to get satisfactory clearances and insulation.

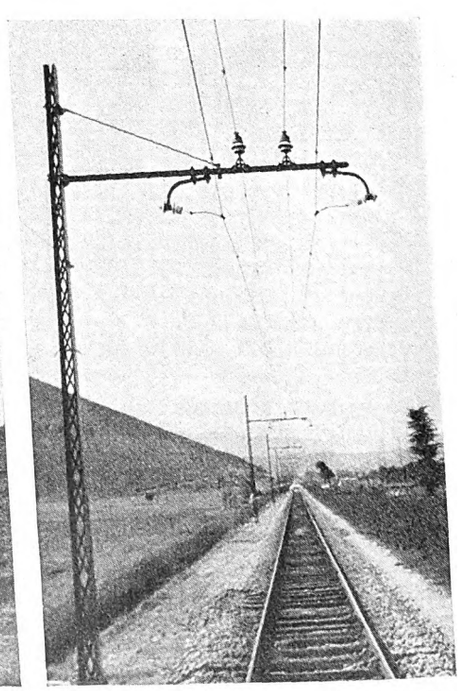
In conjunction with all direct suspension sections a hard-spot eliminating ear has been developed which allows the contact wire to be lifted by the pantograph as it goes under the suspension point. This adds no appreciable weight to the trolley as it passes beneath. A device similar to this was in use on the low-voltage three-



Direct suspension yard construction using two solid No. 0000 copper conductors



Sectionalization point on 10,000-volt, three-phase reinforced catenary for heavy duty



Tangent catenary suspension for high-speed main line, using Hewlett-type insulators

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phase lines, having been developed to reduce trolley failure at suspension points.

Fourteen freight and passenger locomotives have been built for this service. Each has two induction motors, with a combined rating of 2,000 kw. By means of pole changing and parallel or cascade connection four running speeds are available on the passenger locomotive up to 62 m.p.h. and three speeds on the freight locomotive up to 47 m.p.h. The wheelbase is of the 1-D-1 type, the motors driving jackshafts through gears and coupled through a Scotch yoke to the four driving axles. The 10,000-volt trolley potential is transformed to 1,000 volts for the motors. Current limitation in starting is effected by liquid rheostats in the wound rotor circuit. The electrical design has been made with a view to changing to 3,600 volts, 16-17-cycle operation if necessary. The diameter of driving wheels of the passenger locomotive is 64 in. and of the freight locomotives 53 in. The diameter of the idling wheels is 44 in. The total weights are 200,000 lb. and 208,000 lb., respectively, with 143,000 lb. on drivers in each.

Many obstacles were overcome in the design of this overhead system for distributing three-phase alternating current at a potential of 10,000 volts. Another problem was the design of the high-frequency motors and their driving system, to go along with the commercial frequency.

Sell Rides on Low Cost

By H. E. Jordan
Assistant Engineer Los Angeles Railway, Los Angeles, Cal.

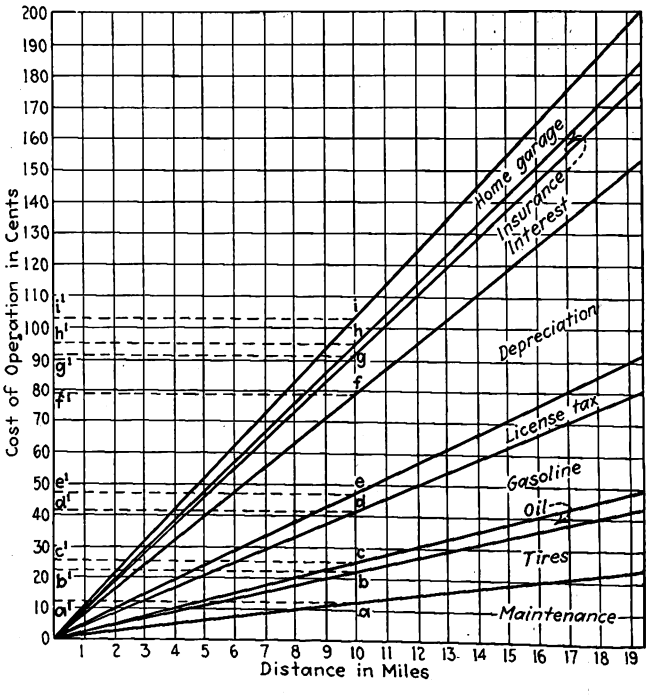
FOUR primary ways exist for selling a commodity against competition: First, make it the most convenient for the customer to buy; second, give more and better service with each sale; third, make the commodity better than any other of its kind on the market, and, fourth, reduce the price of your article below the market price.

While the transportation companies must unceasingly strive to place their commodity so that it may be conveniently purchased, to give more frequent service, to improve the courtesy of their trainmen, and to provide more comfortable riding conditions, they cannot ever hope to equal in these respects the commodity offered by the privately operated automobile. It is this competitor that has made such disastrous inroads in the commercial transportation field today.

Being always at hand when needed, traveling wherever and whenever the owner wishes to go and providing desirable comfort and privacy, the private auto has unquestionably the advantage over the trolley car on the first three points. Electric railways must resort chiefly, then, to selling their commodity at a lower price.

On this score they have a decided advantage over their competitor. This fact is usually admitted. However, transportation companies must sell the idea that this one primary advantage clearly offsets the three others. The companies must capitalize on this argument, just as the auto manufacturers capitalize on convenience, flexibility and comfort.

Many thousands of people drive their automobiles to and from work, or to and from shopping, because they like the service and comfort it renders. They are not bothered about the price they pay. It is too complicated and indefinite for them to figure out, and they continue to deceive themselves from day to day because it is the easiest thing for them to do. It is vital to the transportation companies that they make the privately operated automobile rider face the facts.



What it costs to drive your automobile to town

The accompanying chart, based on a fair average of data, is self-explanatory. A comparison of these data with the rate of fare paid by the average car rider shows that it costs approximately ten times more per passenger-mile for the privately operated automobile than it does for the street car. This tremendous economical difference certainly should outweigh the convenience and luxury of the privately operated automobile.

It may be difficult to make the public read and believe data of this nature, but it is the business of the transportation companies to make them believe it. If the information were placed in the public's hands and pounded into the public's mind, through newspapers, billboards, talks, etc., until the public admitted it was true, wouldn't there be a difference in the transportation company's patronage?

Laundry Bags Advertise Service

FURTHER details regarding the practice of advertising the high-speed interurban service of the Northern Texas Traction Company, Fort Worth, Tex., on the paper laundry bags of the Adolphus Hotel, Dallas, mentioned in the Journal Nov. 12, have become available. The advertisement shows a view in color of the company's "Crimson Limited," which runs between Dallas and Fort Worth. In addition to the picture the text features the topography of the country traversed and the speed, safety and comfort of the service. Economy of the ride by interurban and convenience of train schedules are emphasized. The contract covers 100,000 laundry bags to be used exclusively in the hotel. It is estimated that this amount will be a sufficient supply for two years. The space on the laundry bags cost $1,200, at the rate of $50 per month for twenty-four months. In the event that the bags last over the two-year period the hotel guarantees to use them until the 100,000 are exhausted.

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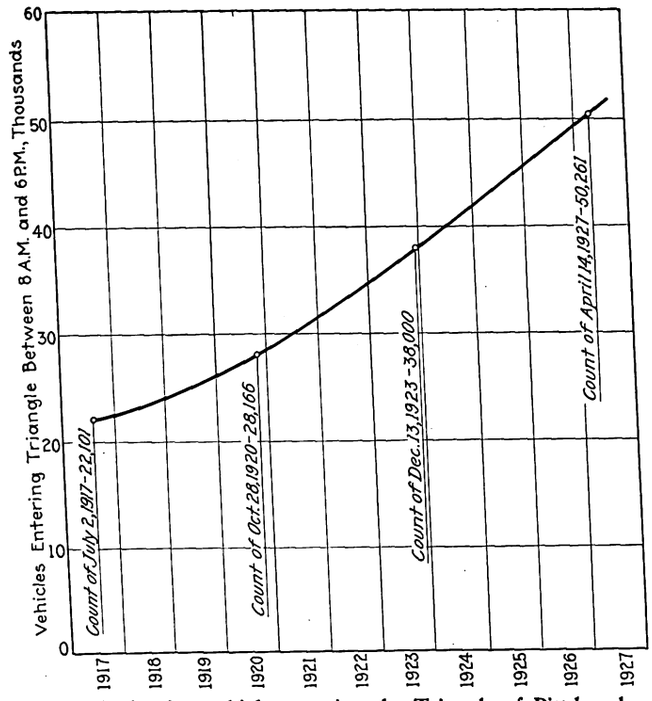
Pittsburgh's Masses Travel by Trolley

Counts show travel into and out of "Triangle" still largely by trolley. Underground tracks recommended in business district

PITTSBURGH, which is the center of a metropolitan community having a population of more than 1,250,000, is earnestly endeavoring to solve its transportation problem. This is especially difficult in that city because, the principal office and financial district is concentrated in a small triangle between the Allegheny and the Monongahela rivers, where they join to form the Ohio.

About three years ago under the direction of the Pittsburgh Traffic Commission and its successor, the City Transit Commission, a rapid transit plan was proposed by Daniel L. Turner, of New York, and Winters Haydock, of Pittsburgh (see ELECTRIC RAILWAY JOURNAL, March 14, 1925, page 409). The plan suggested was approved by the City Transit Commission and a bond issue was authorized by popular vote to construct the first section of the system. It was to be a subway in the congested district and used by the surface cars. Construction has been delayed, however, due to the desire of the city to employ the assessment principle in the financing of the system. A constitutional amendment to authorize this method in Pittsburgh was passed by the General Assembly in 1925, but it still has to be approved by the voters of the state at an election to be held in November, 1928.



Graph showing vehicles entering the Triangle of Pittsburgh between 8 a.m. and 6 p.m., on four selected days

In the meantime the City Transit Commission has been making a detailed survey of surface and underground conditions as a preliminary. It has also seen that the foundations for several new buildings in the downtown area, including the piers for a new bridge across the Allegheny River, were so designed that they would not interfere with the construction of the proposed subway.

The annual report of the City Transit Commission, dated Dec. 22, 1927, outlines some of these activities as well as the result of some recent studies made on Pittsburgh traffic conditions.

The report declares that the problem of street traffic has attained such overwhelming proportions with such suddenness that few cities in the country are prepared to cope with it. This condition is the outgrowth of only two decades of developments in the automobile industry. The fundamental difficulty is that the street systems of all large cities are designed for a horse and buggy civilization, and many of them, including those in Pittsburgh, were very poorly designed for the purposes of even that past era. In the meantime the rate of increase in street traffic congestion is much greater than the rate of increase of population. The proportion of persons owning automobiles is becoming greater each year, and the saturation point of automobile ownership is not yet in sight.

Millions of dollars have been spent by Pittsburgh in the last few years for the widening of old streets and the opening of new streets, and in years just ahead additional millions will without doubt be needed for the same purposes. However, there is a limit beyond which it is not physically or economically possible to go in the changing of the old established street system of a city.

The mass of the population in Pittsburgh, the report says, is transported in street cars, which travel in the same streets as the free-moving vehicular traffic. These free-moving vehicles far outnumber the street cars, but they transport a much smaller part of the population than do the latter. On the other hand, the street cars cause an impediment to traffic that is greater in proportion than the space they occupy, and the mass of automobiles in the street cuts down the efficiency of the street cars to an extent that is scarcely realized.

Railways Nearly Keep Pace With Increased Traffic

The increase in traffic in the "triangle" during the last ten years is adequately shown in the report by the accompanying diagram. It is based on four counts as stated on the graph and shows an increase of about 127 per cent in ten years. This rate of increase is almost ten times that estimated for the population of the state of Pennsylvania for the same period. In spite of this great increase in the flow of vehicular traffic into the triangle, only a small minority of all persons entering the triangle come by automobile. The street car system is still by far the most important means for transporting the people in the conduct of their daily affairs.

This is indicated by traffic counts made by the Bureau of Traffic on April 14, and by the Transit Commission in 1917 of all persons entering the triangle between 8 a.m. and 6 p.m. These figures, expressed in percentages, follow:

	Per Cent of Total	
	1917	1928
Entering by street car	58.2	51.2
Entering by automobiles and taxis	14.9	21.6
Entering by railroad trains	7.8	11.8
Entering by motor buses	0.0	0.8
Entering by walking	19.1	14.8

If only the groups of persons who enter by street car and by automobile or taxi are considered, the respective percentages shown by these counts are as follows:

	Per Cent of Total	
	1917	1928
Entering by street cars	79.6	70.8
Entering by automobiles or taxis	20.4	29.7

These counts show that a greater proportion of per-

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I am glad to have the opportunity to join in doing honor to the leaders in the great industry of urban transportation who are showing the way to continued improvement in service to the public. Never has there been a more insistent demand for betterment of service in every branch of the public utility field. I think it can equally be said that never has the public as a whole been more appreciative of such improvement and more ready to recognize the necessity of adequate financial return to the utilities if they are to give the service desired.

The National Chamber is firmly convinced that in securing this service the public can reap the greatest benefits through the initiative of modern business enterprise. The Chamber is accordingly gratified when the efforts of the managements and the men of our great transportation systems are stimulated and brought to public attention in such a well conceived contest as this which has been established in honor of Mr. Brady.

I should like to add a word on behalf of the National Conference on Street and Highway Safety, a co-operative undertaking of a number of national associations and other official and unofficial groups for improvement of motor traffic conditions. As director of the conference since its organization by Secretary Hoover in 1924 it gives me pleasure to testify to the splendid co-operation of the electric railway executives in the committee work, in the general conferences and in the work of following up and putting into effect the plans worked out by the conference for dealing with the traffic problem.

Charles Gordon, speaking for Mr. McGraw said:

In these days of increasing traffic congestion and hazards we have become so accustomed to the perils and the tragedies of traffic accidents that our minds accept a situation which a decade ago would have provoked instantaneous public horror and demand for radical measures.

Safety has always been a big word with electric railways. Safety measures have constantly occupied the attention of their managements. The effort to avoid accidents permeates every department of an operating company and the accident hazard has always loomed large in the minds of those in charge of personnel and equipment. As street traffic hazards have increased with the growth of congestion, the pressure of accident prevent work has increased in intensity, until today we find electric railways establishing a record for the safety of their service which shines out as one of the brightest spots in local transportation history.

Today, a passenger on a street car is in the safest place on the street. Hundreds of millions of passengers per year are handled in the rush and bustle and impatience of city life, with an unsurpassed record of safety. This is indeed a record of which every electric railway man may be justly proud.

There is not time here to comment on the accomplishments of the winning properties. It is fitting to note, however, that these several roads succeeded in winning public co-operation and commendation for their safety work. Their attention to safety transcended the limits of merely their selfish interest in the reduction of accidents on their cars. They went outside their own operations and participated enthusiastically in general safety movements in their communities. The attention given to the promotion of safety work among children is particularly worthy of note. The safety message is being taken into the schools, so that the child by being taught the importance of exercising caution on the streets, may be better equipped to avoid the perils of traffic.

I am proud to have served upon this committee and feel that the cause in which the award is made, is indeed a noble one. The gratitude of the entire electric railway industry is due the family of the late Anthony N. Brady for making these awards possible. I sincerely hope that they will be continued and that they will enlist constantly increasing interest among electric railway operating companies. The thanks of the industry are also due the American Museum of Safety for the efficient manner in which the awards are being administered. My hearty congratulations are extended to the Louisville Railway, the El Paso Electric Company and the Tidewater Power Company for their success in winning this distinguished honor.

New Type Street Cars in Holland

TWENTY new motor-equipped cars and twenty trailers were purchased a short time ago by The Hague Tramways, The Hague, Holland. Several new features have been embodied with the object of enabling a higher average speed, reduced maintenance costs and reduced weight. These features include lower mounting step, quieter running, better ventilation and lighting, larger windows, leather upholstered seats and more comfort for the passengers generally.

The motor-equipped cars carry 67 passengers and the trailers 71. However, seating accommodations are provided for only 23, fifteen passengers being allowed to stand in the center aisle of the cars and 29 on the front and rear platforms, with an extra four on the trailers owing to the extra space provided by the absence of the control levers.

Platforms are 25 in. from the ground and entrance is afforded by mounting steps on each side at front and rear and through double sliding doors. At each end and on each side are longitudinal seats for two passengers. The remaining passengers face forward, the back rests being reversible. There are five rows of two-passenger seats on one side and five single seats on the other. The domed roof of the vehicle is 9 ft. 11 in. from the ground. The pantograph for the reception of the current is adjustable for overhead conductors ranging in height above the roadway from 12 ft. 5 in. to 22 ft. 11 in.

All the vehicles are of the four-wheel type, fifteen of the motor-equipped cars having a wheelbase of 12 ft. 5 in. and five having 13 ft. 2 in. The length over buffers is 35 ft. 3 in.

The electrical equipment of the motor cars comprises two Siemens-Schuckert self-ventilating motors, which with current at 550 volts have an hourly capacity of 43 kw. at 700 r.p.m. Controllers are provided at each end of the motor-equipped vehicles. The sliding doors are provided with a device by which they can be electrically opened and closed. Fully equipped, but without passengers, the motor-equipped cars weigh approximately 12 tons and the trailers about 8 tons. All the motor-equipped vehicles and ten of the trailers were built by Allan & Company of Rotterdam, and the remaining ten trailers by the Nicaise-Delcuve Company of Bruges, Belgium.

New High-Power Locomotives for France

TWO electric express locomotives for standard gage lines, claimed to be the most powerful in Europe, were recently delivered to the Paris-Orleans Railway by Brown, Boveri & Company. They have been designed for express service between Paris and Vierzon and will deal with trains of 650 tons trailing weight.

These new locomotives are of the 2-D-2 type. Current is received from an overhead line and from a third rail at 1,500 volts, at which pressure a one-hour rating of 4,000 hp. is obtained at the tread of the wheels at a speed of about 73 km. per hour (45 m.p.h.). The total weight of each locomotive is 119 tons. The chief requirements were that the locomotives should attain a speed of about 130 km. per hour (80 m.p.h.) on suitable permanent way and also be able to traverse curves having a radius of 80 m. (260 ft.) at low speed. These conditions led to the use of a two-axle bogie, fitted with a spring centering device, on each locomotive.

Since these locomotives have been in operation it has been possible to shorten the time required for each journey. The journey between Paris and Les Aubrais formerly took from 92 to 100 minutes and that from Les Aubrais to Vierzon 74 to 76 minutes. Since electrification it is possible for trains of 530 tons to run over these sections in about 75 to 55 minutes respectively.

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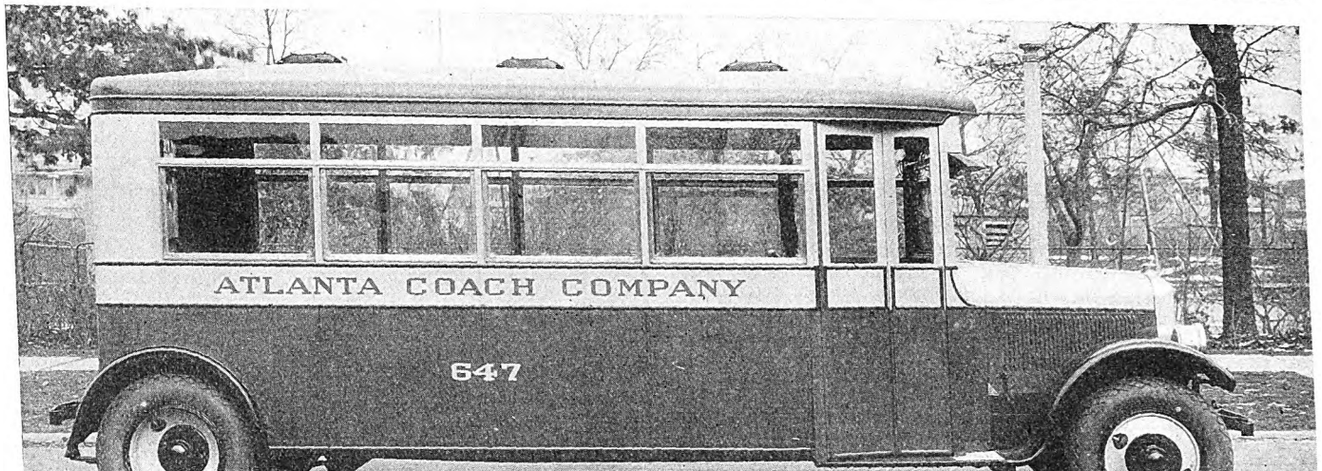


This single deck coach has supplanted the double decker for base service in Atlanta

Single-Deck Buses Give Base Service in Atlanta

WHEN bus service was begun in Atlanta by the Georgia Power Company a little more than two years ago, double-deckers were purchased. It was believed that the upper deck would attract many passengers except during very inclement weather.

Double-deck coaches were operating exclusively during 1926, but the operating expenses were so large, it was decided either to substitute a smaller coach or discontinue the service. In consequence, ten single-deck coaches of 21-passenger capacity were purchased. During 1927 they were operated exclusively on the base schedules. The double-deckers helped to carry the rush hour crowds and were also in demand for chartered service by picnic parties, convention delegates and other large groups.

The operating expenses and revenue during 1926 and 1927 of the bus service in Atlanta are given in the accompanying table.

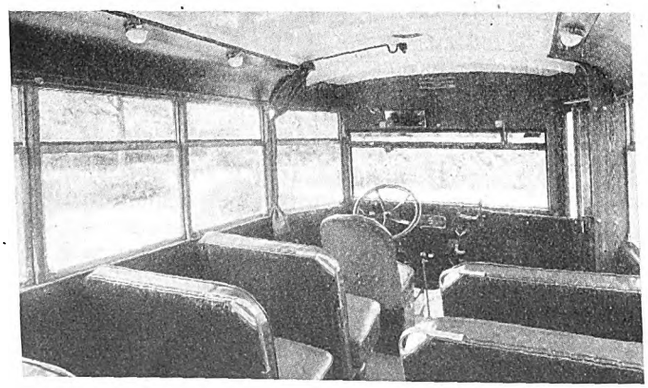
It will be noticed that while the revenue from operation is slightly less in 1927, the operating expenses show a reduction of $49,268.53. Of this amount about $14,100 can be attributed to the reduction in tire prices, brought about by buying tires on a mileage basis. Allowing for this saving in tire cost, there is a net saving in operating expenses of $35,268.53. Part of this saving in operating expenses is due to certain economies which have been effected at the garage because of changes in methods and new equipment which has been installed. While the net amount saved in this way cannot be accurately determined, the officers of the company do not estimate it as a very considerable factor but consider that most of the saving is directly attributable to the operation of the lighter equipment.

SUMMARY OF OPERATIONS, ATLANTA COACH COMPANY

	1927	1926
Revenue from operation	$108,162.84	$109,868.75
Operating expenses	124,946.63	174,233.16
Deficit from operation	$16,783.79	$64,364.41
Bus-miles	528,086	504,418

The reduction in revenue from operation is due very largely to a decrease in Sunday and holiday riding. When the coaches were first put on, Sundays and holidays were the busiest days. After the novelty wore off, this riding decreased, so that Sunday riding now is lighter than on week days in about the same proportion as on the street railways.

The accompanying engravings show exterior and interior of one of the single-deck buses, as built by the Yellow Truck & Coach Manufacturing Company.



The 21-passenger coaches operated by the Georgia Power Company in base service are fitted with comfortable seats and the interior is well lighted

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Maintenance Methods and Devices

Magnet Valve Gage

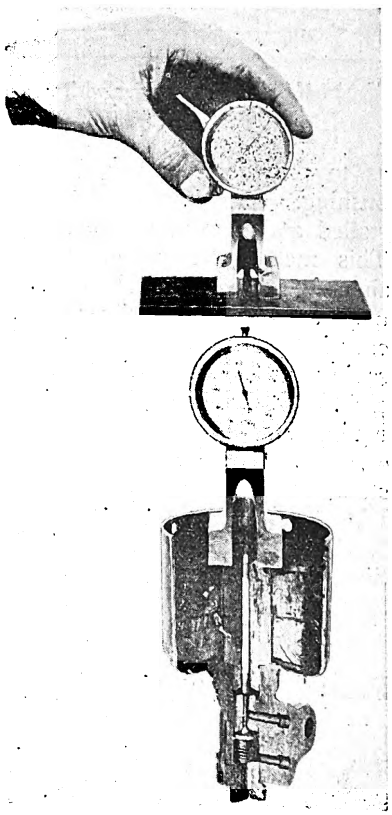
By R. S. Beers,
Railway Engineering Department General Electric Company, Schenectady, N. Y.

When maintaining magnet valves it is desirable to measure the length of the valve stem when overhauling or at more frequent periods. An indicating device that will give measurements in thousandths of an inch can readily be constructed by making an adaptation of an indicating surface gage.

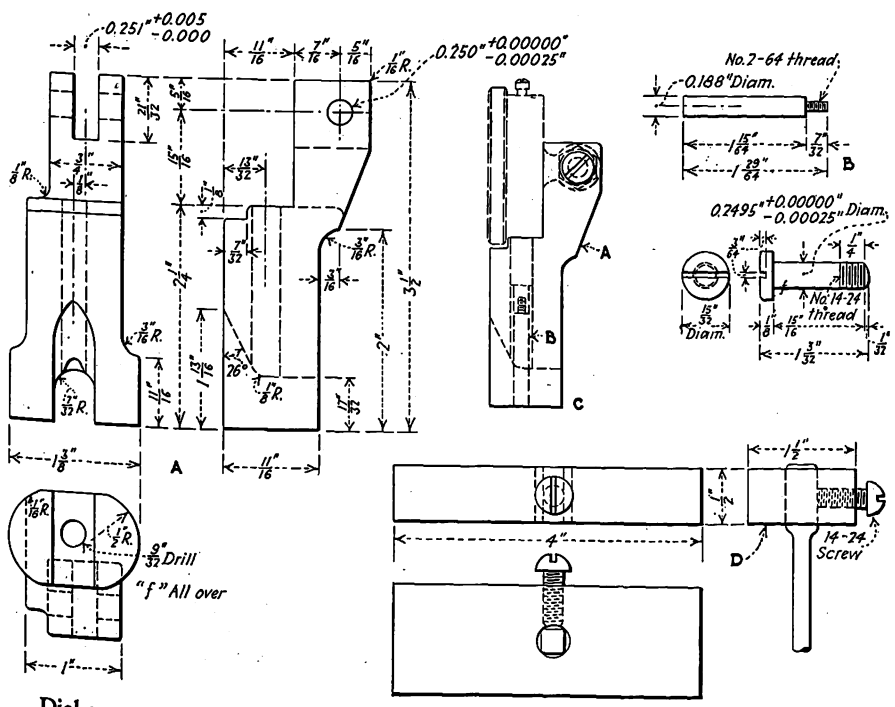
A gage for this work may be purchased from any hardware store. It should have an adjustable dial and a push pin at the top, the former for easy setting of the pointer at the zero position and the latter to check the travel of the valve movement. It will be necessary to make and add to the gage a support or pedestal, as shown at part *A* in the accompanying line cut. Part *B* is an extension piece to the gage push rod. The assembly of the gage and new parts is shown at *C*. Before making any measurements the gage should be adjusted by placing it on any flat surface and turning the adjustable dial until the zero position coincides with the pointer. The gage should then be set on the magnet valve core with the push rod resting on top of the valve stem, as shown in the illustration. The gage then reads directly in thousandths of an inch the distance the top of the valve stem is above the top of the magnet valve core. The push pin is then pushed down and when the valve seats, its travel is read in thousandths of an inch.

These measurements are made quickly and accurately and show whether the valves need replacing or are suitable for further service. The gage has a further use when fitting new valves, as it will indicate quickly how much metal must be removed from the valve stem. The new valve stem is first put in the valve and then gaged.

Assuming that the gage shows that the new valve stem is 0.005 in. too long, the valve stem should be removed from the valve and put in the fixture shown in sketch *D*. The gage should then be set on the fixture with its push rod on the top of the valve stem. The valve stem should next be moved either up or down until the gage shows that the stem projects 0.005 in. above the flat surface of the fixture. The stem is then clamped in the fixture and the top of the valve stem filed off flush with the surface of the fixture. This is a quick and accurate way of making the valve stem the exact length desired. Valve stems finished in this way present a flat surface for the magnet valve armature to strike against and prevent mushrooming of the top of the valve stem.



Micrometer gage for adjusting magnet valve. At top, adjusting gage dial to zero on flat surface; below, method of using gage on magnet valve



Dial gage on support. *A*—pedestal, *B*—extension for gage pushrod, *C*—assembly of gage and parts, *D*—fixture for valve stem setting

Bushing Provides Increased Service for Brake Hangers

By H. C. Pressler,
Master Mechanic Eastern Texas Electric Company, Beaumont, Tex.

Case-hardened bushings are used in the half-ball brake hanger shown in the illustration herewith. Each bushing is spot welded to the hanger and can be knocked out easily when worn so that a new one can be installed. Before these bushings were used on equipment of the Eastern Texas Electric Company worn hangers of this type were taken off Birney safety car trucks and thrown into a scrap pile. Now they are all reclaimed by filling in with the welder and then grinding off so

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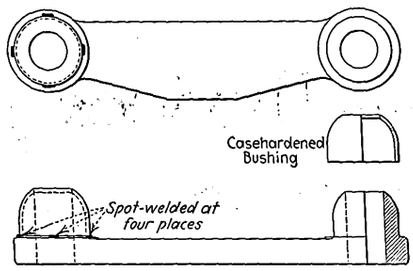


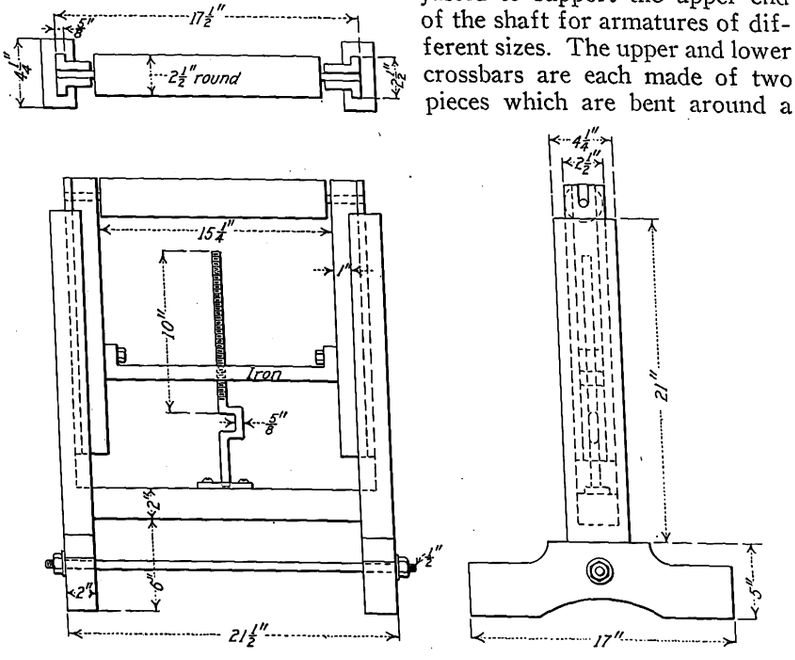
Half-ball break hanger with case-hardened bushing

as to provide a proper fit for the bushing. The bushing is then installed and is spot welded in place. This method of reclamation costs about 30 cents for each hanger. When only a new bushing is required, the cost is 14 cents. There is quite a saving, as new hangers cost $1.65 each. Brake-shoe heads are also equipped with these bushings and castings. Alemite fittings were installed on the shoe heads in 1926. With the installation of the bushings, together with the improved lubrication system, noise in brake rigging has been kept to a minimum.

Portable Adjustable Stand for Drill Press

DRILLING has been simplified greatly in the Woodside shop of the New York & Queens County Railway, Long Island City, N. Y., since a portable adjustable stand was developed for supporting the material undergoing the drilling process.

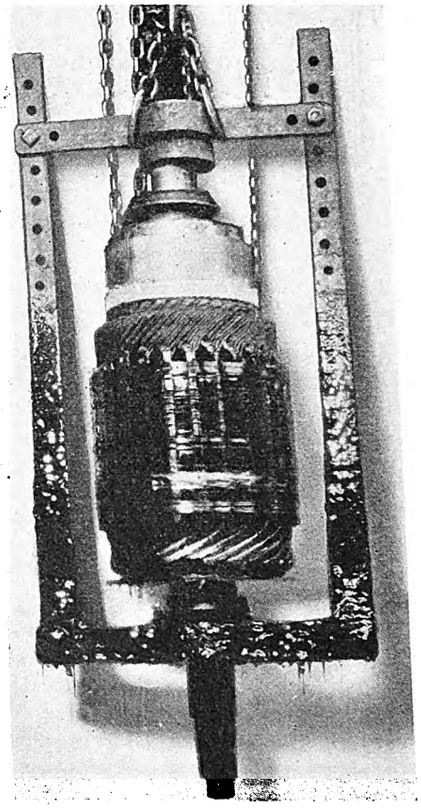
This stand, occupying a space of 17 in. by 21½ in., is made from well seasoned oak. It is 26 in. high in the fully collapsed position. The 2-in. x 4½-in. uprights are mortised into the 2-in. x 5-in. x 17-in. feet and tied together with a ½-in. bolt and a 2-in. x 4-in. beam at the base. Vertical notching of these uprights provides a guide for the up and down movement of the roller supporting framework. The top of the uprights of the movable framework is notched for a bearing support of the roller and the correct center of these uprights is maintained by an iron tie bar drilled in the center for the reception of an adjusting screw. An iron plate fastened to the top of the 2-in. x 4-in. cross beam acts as bottom guide for the ⅝-in. adjusting screw. Turning the adjusting screw permits of raising or lowering the roller to any height desired.



Stand for supporting and guiding material while being drilled

Adjustable Sling for Armatures

WHERE the end method of dipping is in use some type of sling is necessary for handling the armature during the dipping process. The accompanying illustration shows the adjustable sling used in the shop of the Binghamton Railway, Binghamton, N. Y. It consists of a top and bottom crossbar and two side arms, all being made from ½-in. x 2-in. material. The lower ends of the side arms are bolted loosely to the bottom crossbar to form a hinge and the tops are drilled with eight pairs of $\frac{11}{16}$-in. holes spaced at 2-in. centers. This allows the top crossbar to be adjusted to support the upper end of the shaft for armatures of different sizes. The upper and lower crossbars are each made of two pieces which are bent around a



This sling will accommodate different length armatures

¾-in. mandrel and riveted and welded together. The ¾-in. holes provide an opening for the entrance of the shaft. The sling is 42 in. long over all, and 20 in. wide and is put on and adjusted when the armature is in a horizontal position. The weight of the armature is carried on the pinion end oil deflector.

Bus Cleaning Systematized With Shower Rack

WATER pipes on the regular framework of a wash rack are arranged ingeniously in one of the garages of the Milwaukee Electric Railway & Light Company, Milwaukee, Wis. As rapidly as the buses roll in from their daily schedule, they are run under the framework shown in the accompanying photograph and are subjected to a thorough soaking and cleansing, from which they emerge spick and span for the next day's trips.

Two rows of horizontal water pipes, one at a slightly higher level than the bus roofs and the other about level with the fender crowns, are perforated so that water is sprayed evenly and with some force against both sides of the bus at the same time. Water jets placed at the ends of the horizontal pipe lines contribute additional streams to clear both front and rear of the bus body of its ac-

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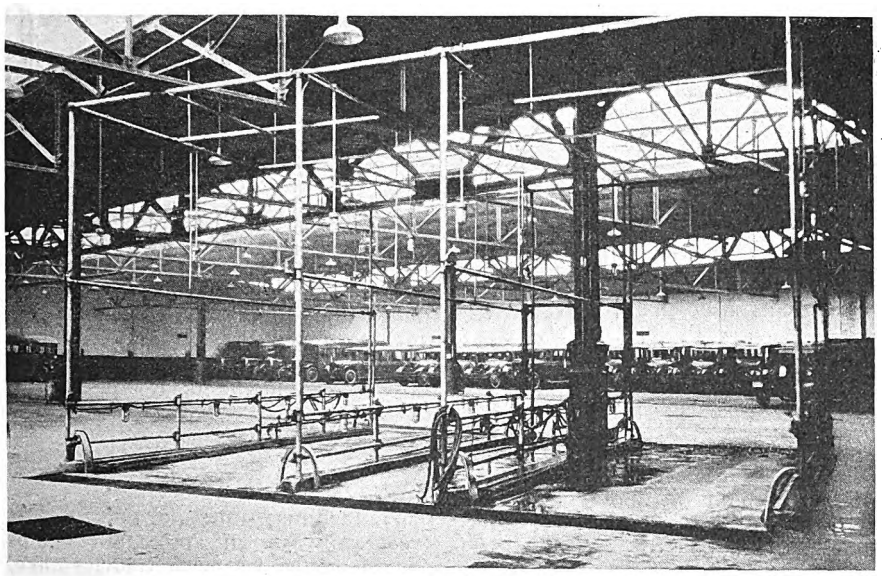


Pipe frame spray rack speeds cleansing of Milwaukee's buses

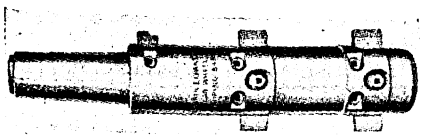
cumulated dirt. Spraying the water on the bus body in fine streams makes it possible to soak the dust and dirt in short order.

Rigidly mounted lamp units are so placed on the framework of the wash rack as to illuminate every part of the bus to be cleaned. Two buses may be washed simultaneously in the double wash frame shown. The arrangement of the pipe frames is such, however, as to lend itself to the addition of an indefinite number of "wash booths."

New Equipment Available

Expansion Boring Bars and Cutters

EXPANSION boring bars and cutters in a new line are announced by the Larkin Packer Company, St. Louis, Mo. Simplicity of construction and ease of operation are features claimed. All unnecessary parts, such as wedge guides, gibs, etc., that tend to weaken a tool due to the removal of excess metal from the tool body have been eliminated. The boring bar bodies are forged of chrome-nickel steel and heat treated. Cutters are of high-speed steel tempered to a uniform hardness.



Triple-duty car wheel-boring bar

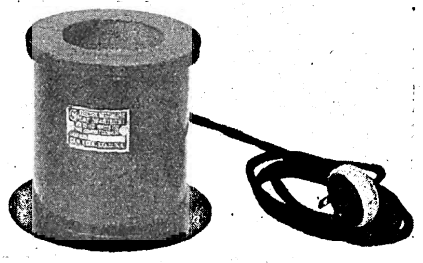
A micrometer adjusting screw piloted in a hardened and ground self-centering thrust bearing controls movement of the expansion wedge and assures quick, accurate adjustment. Cutters are fitted to slots of standard dimensions and are adjustable quickly to any size within range of the bar without special grinding. Direct locking, with each cutter held rigidly in the cutter slot by a piloted eccentric locking screw, insures accuracy of bore. All parts are standardized, and cutters are interchangeable. When worn beyond the expanding limits, they may be used in smaller bars of the same slot dimensions, and they are also adaptable in adjusting tools of other makes.

For boring out car wheels to fit axles, a Larkin triple-duty bar is designed with double arrangement of cutters so spaced as to permit roughing cutters to pass before finishing cutters engage, the single cutter chamfering the wheel following the finished cut, all in one continuous feed.

For older mills, where the spindle travel is insufficient to accommodate the wheel-boring bar, another type with distance shortened between the roughing and finishing cutters is supplied. This is designed to rough bore and chamfer on the first cut and finish bore separately on the second cut. For shops in which only a limited number of wheels are bored, a bar with a single arrangement of expanding cutters is recommended.

Portable Tinning Pot

SMALL tinning and soldering operations can be done conveniently by a late addition to the line of electric heating equipment made by the General Electric Company, Schenectady, N. Y. This portable tinning pot bears the designation RP, Form C. The device is built on the same principle as the larger General Electric melting pots. The heating unit is of the cartridge type and dissipates 150 watts. It is placed in a boss cast on the bottom of the crucible and is readily removable. The crucible and base are made of cast iron and the jacket is made of sheet steel. The connecting leads are heavy Deltabeston heater cord and the plug is of the armored type.



Melting pot for dipping small parts

The pot is designed particularly for solder and tin having a maximum operating temperature of 500 deg. F. About fifteen minutes is necessary to reduce the full contents of the pot to working temperature.

While the pot is designed normally for 110 volt circuits, it can be supplied for use on 100, 120 and 240-volt circuits, if desired. It has an approximate shipping weight of 6 lb. The dimensions are $2\frac{1}{4}$ in. diameter, 1 in. deep inside, 5 in. diameter and $4\frac{1}{2}$ in. deep outside.

Thin Wrench for Small Spaces

NUTS that are hard to get can be turned with a wrench designed especially for that purpose, which is manufactured by the Billings Spencer Company, Hartford, Conn., and is marketed under the trade name "Klose-Kwarter Wrench." It is double headed, with the openings at a 75 deg. angle. Jaws are narrow and pointed and the heads are very thin. Both heads are on the same side of the wrench; this affords a comfortable grip and leverage.

The new wrenches are made in sizes to fit standard nuts. They are drop forged from chrome-molybdenum steel, which is exceedingly tough.

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Association Activities

New Englanders Face Industry Problems

Vital importance of merchandising transportation set forth at Providence meeting. Bus maintenance paper presented

REBUILDING of street railway traffic through vigorous merchandising methods was the keynote of the Feb. 9 meeting of the New England Street Railway Club held at the Hotel Biltmore, Providence, R. I. The program was arranged by A. E. Potter, president of the United Electric Railways. Vice-President W. C. Slade occupied the chair in the absence of R. B. Stearns, president of the club. Two sessions were held as usual, with a banquet between them. The speakers at the afternoon session were: W. C. Bell, general manager Narragansett Electric Company, Providence, whose subject was "Outside Observations of the Street Railway Business"; W. B. Spencer, assistant to the general manager, United Electric Railways, who talked on "Serving a Nation—'Forward Ho' for the Trolleys"; and H. W. Jardine, supervisor of bus equipment, United Electric Railways, on "The Necessity for Closer Co-ordination of Service Automotive Equipment and Bus Maintenance."

At the evening meeting a joint session was held with A.E.R.A. company section No. 12, H. K. Bennett presiding. The speakers were Hon. James E. Dunne, mayor of Providence; John W. Colton of the American Electric Railway Association, on "The Present and Future of Street Railways," and John F. Tinsley, vice-president and general manager Crompton & Knowles Loom Works, Worcester, Mass., on "The Future of New England."

Mr. Bell, speaking from the standpoint of an outsider, pointed out the marked difference between the electric railway business and the light and power industry. One fundamental reason, he said, is that the electrical industry can be operated and is operated in such a manner that it suits the convenience of the user at all times, while the electric railway, to some extent at least, must force the user to suit himself to the service. With this handicap, if the railway is to hold its own or increase its business, the service must be sold to the public. The desire to ride must be created, and the objectionable feature of public transportation must be minimized.

Mr. Bell's observation is that the street railway business has not even started to do a selling job. The street railways must start on this sales job earnestly and with real determination, and not spasmodically as in the past. Somebody, perhaps several people, perhaps whole departments, in each company and in the industry organizations, must study this problem, work on it morning, noon and night, eat, sleep, dream it, and must have the sympathetic backing of the management if results are to be obtained anything like those accomplished by the industries behind the motor car, silk stockings, or cigarettes. A real sales policy, program and organization are essential.

Reasons for Automobile Use

Fewer riders are being carried by the electric railways, according to Mr. Spencer. He believes that this reduction in business will stop, but feels that additional riders must be obtained from the ranks of those now using private automobiles. The reason for the use of the automobile by these potential riders, he said, is probably because it is not necessary to wait on the corner, the rider is assured of a comfortable seat, a private unit, with continuous motion until the destination is reached. Perhaps the railways need a smaller unit operating more frequently. On the other hand, Mr. Spencer believes there is no substitute for mass transportation service. Automotive vehicles could not meet the test, due to lack of sufficient unit carrying capacity and the utter lack of sufficient street capacity. To get back the business Mr. Spencer advocates a national advertising campaign through newspapers, magazines of the greatest circulation, billboards and radio.

Commenting on the foregoing papers, vice-president Slade said that he was forcibly struck with the statement of a speaker that he would rather ride in the oldest "relic" the company has on the streets than to wait five minutes for one of the most modern type trolley cars with linoleum floor, plush seats, wide glass windows and ultra-modern lighting. This means that the availability of the service is the all-important thing. Speed is another very important factor in patronage. Mr. Slade said that the average street railway will have to use buses more extensively if it is to render the type of service above described.

A motion picture "East Side, West Side," drawing a comparison between the convenience, speed and comfort of street car and automobile travel in city service, was shown. John W. Colton spoke of the organized efforts the companies in Chicago, Pittsburgh and elsewhere have been making in the past decade to "sell" transportation. The film above mentioned, slightly modified, is now available through the American Electric Railway Association.

Charles C. Pierce, General Electric Company, Boston, commented upon the importance of developing the industry commercially and stated that plans are afoot to recapture lost traffic on the Boston, Worcester & New York Street Railway by placing open type cars in service.

Co-ordinated Maintenance of Automotive Equipment

Mr. Jardine pointed out that on most street railways all automobile equipment, buses and service vehicles alike, should be maintained in one group as motor-vehicles. Some roads operate nearly as many service vehicles as buses. From appearances, many operators are not giving as much attention to service equipment as they should. Apparently, street railways now operating buses are passing through a period of transition in maintenance practices similar to that through which the large motor-vehicle companies went several years ago. Many of the latter had no periodic lubrication and inspection, overhaul programs of any kind, and paid dearly for their neglect in poor returns and costly maintenance.

On one property, he said, fifteen years ago the usual method of rebuilding was to pull the truck out of service, dismantle it and reconstruct from the ground up. This was satisfactory as the fleets were made up of so many types, makes and capacities that the cost of stand-by units was prohibitive. Its weak point was the great number of service hours lost during overhaul. About 1916 many of the older motor vehicles had been retired and steps were taken to standardize fleets. It was found feasible to start a unit overhaul program, because experience had shown that a complete overhaul of a vehicle failed to obtain the necessary results either in satisfactory operation or sufficiently low maintenance costs.

It was found that some units were capable of continuous operation for longer periods than others, and that a great deal of time and labor could be saved if complete assemblies were changed as units. It was therefore necessary to establish a simple system of mileage records and an identification system of unit numbers for all parts of the vehicle except the body and frame. Under this system a sufficient number of spare parts were held in readiness, so that, for example, when the engine on a truck had reached the point of overhauling, determined by the number of miles it had been continuously operated, a spare engine could be quickly substituted with minimum loss of service time to the truck. Not only was the loss of time to trucks cut down, but a considerable

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saving in the machine shop followed. A number of street railways operating motor buses, including the United Electric Railways, as well as some motor vehicle transportation companies have adopted this system of unit overhaul.

There are many reasons why automotive service equipment should be maintained at a high standard. The operation of service vehicles is generally tied up with a large number of workmen, and the failure or poor performance of a service vehicle frequently represents a considerable loss of labor. Such vehicles are generally identified with emergency repair work, and failure not only represents a loss of time but may contribute to the length of time that the basic schedules are interrupted. These losses of course do not appear in the vehicle maintenance costs.

The Future of the Electric Railway Industry

Mr. Colton pointed out that about 41,668 miles of track are now being operated by the street railways of this country, a decrease of 7.2 per cent from the maximum of 44,835 miles in 1917. Over 18,000 miles of bus routes are in service, all established since 1921. There are about 75,000 electric street cars in operation and 9,000 motor buses run by traction companies. Last year the operating revenues of the industry were 2.5 per cent below 1926; expenses were 1.8 per cent less and net revenue 4 per cent less. The operating ratio increased to 75.2 per cent last year as against 74.6 per cent in 1926. Rail traffic was 3.25 per cent below 1926, and combined rail and bus traffic was 1.25 per cent lower.

The Metropolitan cities of New York, Chicago, Philadelphia and Boston show traffic increases of one-fourth of 1 per cent, but elsewhere losses average slightly over 2 per cent. In the small cities, those of 30,000 population or under, it is estimated that traffic has decreased 25 per cent since 1923. The interurban roads, most of which operate in comparatively thinly settled sections of the Middle West have lost about 22 per cent. In medium sized cities losses range from 1 to 7 per cent. Only a few have shown increases.

If these losses of traffic had been confined to the last year or two we should have little concern about them, but actually there has been a continuing traffic decrease for some years.

While figures like these sound depressing, we need to have them in order to face the facts. Mr. Colton declared that he believed the worst is over and that from now on traffic will show gains. The chief cause of lost traffic is private automobile competition. Before the automobile became cheap the traction industry gained an average of 5 per cent yearly in traffic. As the number of motor cars grew troubles began, until finally there were some who proclaimed the end of the industry. Motor bus manufacturers were notable among these prophets of doom; experience has shown that they were wrong, and in recent years electric railways have actually been their best customers.

"My belief," said Mr. Colton, "that we have about reached rock bottom in traffic losses is based on two facts, (1) the automobile industry seems to be approaching the saturation point in the distribution of private vehicles; (2) the productive power of industry seems to have become greater than the consuming power of the public, with the result that industrial conditions are somewhat unsettled."

COMING MEETINGS OF *Electric Railway and Allied Associations*

March 2 — Metropolitan Section, American Electric Railway Association, Engineering Societies Building, New York, N. Y.

March 13-15—Oklahoma Utilities Association, annual convention, Tulsa, Okla.

March 14-15 — Illinois Electric Railway Association, Springfield, Ill.

March 21-22 — Central Electric Traffic Association, Seelbach Hotel, Louisville, Ky.

March 23—Maryland Utilities Association, annual meeting, Emerson Hotel, Baltimore, Md.

March 30—Executive Committee American Electric Railway Association, 292 Madison Avenue, New York, N. Y.

April 26-28—Missouri Association of Public Utilities, Jefferson City, Mo.

May 2-5—Southwestern Public Service Association, Dallas, Texas.

May 6-12—Union Internationale de Tramways, de Chemins de Fer d'Interet Local et de Transports Publics Automobiles, biennial meeting, Rome, Italy.

June 6-8—Canadian Electric Railway Association, annual convention and exhibits, Toronto, Canada.

June 20-27 — American Railway Association, Div. 5—Mechanical (including former activities of the Master Car Builders' Association and the American Railway Master Mechanics' Association), annual convention and exhibit, Atlantic City, N. J.

June 21-22 — American Railway Association, Motor Transport Division, Atlantic City, N. J.

June 28-29—Central Electric Railway Association, Cedar Point, Ohio.

July 8-12—Public Utilities Advertising Association and International Advertising Exposition, Detroit, Mich.

July 25-27—Electric Railway Association of Equipment Men, Southern Properties, Cincinnati, Ohio.

SEPT. 22-28, 1928

American Electric Railway Association, 47th annual convention and exhibit, Cleveland, Ohio.

No matter how convenient the motor car may be to the individual it is undeniable that the presence on city streets of many thousands of automobiles tremendously increases the life hazard and materially affects the volume of business done by the merchants. It also places a heavy financial burden upon the taxpayer. Not long ago merchants in cities like Providence and Boston thought that the presence of a line of shiny cars in front of their doors advertised their popularity. Lately they have been finding that this does nothing but block the entrances to their place of business. Therefore, there is an increasing demand from merchants and other business men for the abolition of parking. Where parking has been forbidden in business districts, as in Pittsburgh and Chicago, it has been found that all kinds of traffic move more rapidly and that it is easier for the public to reach the stores.

It will not do for electric railway men to sit back and wait for business to come to them. The demands of the public today are vastly different from those of a few years ago. There is no panacea to be applied equally in all communities. It is quite possible many companies will have to abandon rail lines operating through the so-called high-class residential district and substitute for them a modern system of motor bus transportation.

Above everything else public transportation must be attractive, and having been made attractive it must be actively sold. After all the transportation business is nothing more than a merchandising proposition. Only by active, persistent, continuous promotion of the advantages of street railway service will it be possible to attract to the cars those who now prefer to ride in their own private vehicles, even though they know that the cost of using the private vehicle is much greater than that of using the street car or public service motor bus, and are fully aware of the inconveniences of driving through congested traffic.

Utilities Advertising Association Studies Stockholder Contact

A SPECIAL committee designated as a committee on contact with stockholders has been appointed by Donald M. Mackie of Hodenpyl, Hardy & Company, president of the Public Utilities Advertising Association, to study the practices employed by public utilities with respect to contact with stockholders. William H. Hodge, vice-president Byllesby Engineering & Management Corporation, has accepted the chairmanship and is working out a plan of activity.

Among the objectives of the committee will be a study of the policies observed by different utilities throughout the country in the matter of establishing contact with stockholders and the practices followed in keeping stockholders informed not only as to earn-

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ings in customary channels but also as to what is being done to inform them as to the company's plans, its developments and its activities in the public service. From present indications, practices followed by different utilities are widely divergent in their aims and operations. There is a great diversity of opinion as to the manner and extent of disseminating information. This is the first study of this nature undertaken in the industry since the customer-ownership movement attained its present proportions.

The committee, in addition to Chairman Hodge, includes:

A. C. Watt, Hodenpyl, Hardy & Company, Inc., New York; Paul Jenkins, Utility Securities Company, Chicago; R. E. Smith, Southern California Edison Company, Los Angeles; Robert Montgomery, Louisville Gas & Electric Company, and C. E. Neil, North American Company, New York.

Special Transportation Arrangements for Rome Convention

SPECIAL arrangements have been made for transportation to and from the Rome convention of the Union Internationale de Tramways, de Chemins de fer d'Interet local et de Transports Publics Automobiles. The sessions will be held May 6 to May 13 inclusive, but during the convention a trip will be made to Naples, and after the convention one to Turin and Milan to inspect the electric railway systems there. In an announcement made on Jan. 25 it is explained that Premier Mussolini of Italy has agreed to act as honorary president of the congress.

The transportation arrangements for those who expect to attend from this country have been made with the Navigazione Generale Italiana line, whose headquarters are at 1 State Street, New York. The registration fees at the convention will be 100 lire (about $5.30) for gentlemen and 50 lire (about $2.65) for ladies.

Work of Special Libraries Association Told in Year Book

PURPOSES of the Special Libraries Association, and the advantages of membership in the organization, are set forth in a year book recently issued. It was sponsored by the membership committee, of which Lewis A. Armistead of the Boston Elevated Railway is chairman.

There are at present about 1,200 members and subscribers in the United States, and four specialized groups have been formed within the national association. These are the Commercial-Technical, Financial, Insurance and Newspaper groups.

Included in the membership are several of the larger electric railways and holding companies. Largely through their co-operation the bibliography on transportation has been enlarged so that many subjects in the field may be studied with much less effort than formerly. Those who visited the exhibit of the association at the last Cleveland convention were impressed with the value of the work which has been done along these lines, according to the year book.

Central Traffic Association of Growing Importance

WORK of the Central Traffic Association was reviewed in the annual report of the chairman, presented at the recent Cincinnati meeting. As each year brings additional legislation, states the report, further rulings from the Interstate Commerce Commission and state commissions and a broadening in the scope of the activities of association lines, so the past year has been the most active in the history of the association. Tariff publications are more numerous and more comprehensive to meet changes made effective in steam road tariffs applying on competitive traffic, or to enable electric roads to extend their operations to points on steam line connections. Changes in freight equipment and the purchase of new equipment have necessitated the reissue of the Equipment Register. Twenty-six changes in the classification of commodities have made necessary reissue of the Joint Exception Tariff and the issue of one supplement. The Joint Class Rate Tariff, first published on Jan. 1, 1926, has been revised and is now ready for reprinting. Two new freight tariff publications have been completed during the year, one a Prepay Class Rate Tariff and the other the Joint Dispatch Freight Tariff.

During the year five regular and two special meetings were held, the average attendance being 33 members. Twenty-eight committee meetings have been held and 147 subjects have been considered by the association. Among the valuable things done by the association have been changes in the rules governing settlement of freight claims, transportation of freight by truck, revision of the official interurban map, and an institutional advertising compaign. The past year has witnessed the consummation of through joint class rates to territory south of the Ohio River. This will greatly extend the territory for which shipments can be accepted by the electric lines.

"The success achieved by the Traffic Association," concludes the report, "is due to a very great extent to the splendid co-operation of each individual member and the untiring efforts of the association committees. Delays in the performance of certain work have occurred, and certain work has been authorized by the association which has not been completed as the man power available has not been sufficient to carry out all these plans, but these matters are being worked out with the idea in view of affording the greatest possible benefit to the association members."

Central Accountants' Association Elects Officers

FORTY members from Indiana, Ohio, Kentucky, Pennsylvania and Michigan attended the convention of the Central Electric Railway Accountants' Association held at the Hotel Gibson, Cincinnati, on Feb. 17-18. Interchange rules applying to the accounting systems used by various railways, both steam and electric, in handling freight records, were the center of discussion.

The following officers were elected for the ensuing year:

President, F. A. Healy, auditor and treasurer Indiana, Columbus & Eastern Traction Company, Springfield, Ohio.

First vice-president, H. F. McColgin, auditor Interstate Public Service Company, Indianapolis, Ind.

Second vice-president, C. E. Baker, auditor Lima Toledo Railroad, Lima, Ohio.

Secretary, L. E. Earlywine, Indianapolis, Ind.

Executive committee — Terms expiring in 1929: J. B. Hooper, Detroit, Mich., and L. J. Wetzler, Chicago, Ill. Terms expiring in 1928: O. A. Small, South Bend, Ind., and A. E. Wafer, Akron, Ohio.

In his inaugural address President Healy traced the history of the association and its influence in the national association. Coming into the electric railway field in 1906 from the steam railroad field, Mr. Healy was instrumental in forming this association, which was organized in the spring of 1907. At that time, he said, electric railway accounting was in its infancy. There was no uniform classification of accounts and no standards to go by. Fortunately most of the auditors at that time came from the steam railways or at least had training in that school, so that after forming the association it was not difficult to harmonize the views of the auditors of the various railways and finally bring about a uniform system of accounting.

Mr. Healy pointed out that a number of the leaders in the American Electric Railway Accountants' Association have been actively connected with the Central Association, six presidents out of fifteen having been members. He said the electric railway accountants are still young in their experience compared with the steam railroad accountants. To succeed in the future it is necessary to keep abreast of the times, to study new methods and to co-operate one with the other.

It was decided to hold the next meeting of the association in Detroit, on July 27-28.

British Tramways Association Meeting

ANNOUNCEMENT has just been made that the annual conference of the Municipal Tramways and Transport Association of Great Britain will be held in Manchester, England, on Sept. 12, 13 and 14, this year.

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News of the Industry

No Rehearing in Baltimore

The United Railways & Electric Company, Baltimore, Md., has decided for the present not to ask the Public Service Commission for a rehearing in either the fare case or the easements case, both of which were decided a short time ago.

Just before the fare order was handed down the Public Service Commission placed a valuation of $5,000,000 on the company's easements, a reduction of $2,000,000 from the figure first set. The $7,000,000 valuation case was appealed to the courts and the Maryland Court of Appeals ruled that it was proper to value the easements but held that the commission had not done so in the proper manner. Another hearing was held and the $5,000,000 figure placed on the easements.

A few days after this case the commission handed down an order and opinion granting the company a fare increase from 7½ cents or two tokens for 15 cents to 9 cents or three tokens for 25 cents. This decision and order were dealt with at length in ELECTRIC RAILWAY JOURNAL of Feb. 18. Under the Maryland Public Service Commission law the United had either to accept the ruling or file notice that it would not accept it within ten days.

In a statement sent to the commission by Charles D. Emmons, president of the United, and also signed by counsel for the company, it was said that both cases were so fully presented before the commission that the company felt that no good could be accomplished through rehearings. The statement mentioned, however, that that action did not affect the company's rights to ask for a judicial review of the findings by an appeal to the courts, which rights were fully reserved.

The company has 60 days from the date the decision was handed down in which to appeal to the courts. Officials of the United will make a close study of the effect of the increased fare before deciding upon an appeal. The original petition asked the commission for an increase to a 10-cent straight fare.

Traction Legislation Continues in Chicago

Deliberations of the Chicago City Council traction sub-committee in the drafting of acceptable legislation for the solution of the local transportation problem again have reached a point of almost hopeless confusion. Three terminable permit bills are now being considered by the sub-committee as a result of nearly eight months of intermittent work and negotiation.

One bill presented recently by Alderman Jacob M. Arvey seeks to give unlimited power to the city to grant a franchise without limitation of time. A second drafted by the corporation counsel is also without time limitation but stipulates that the penalty for violation of the terms of the grant shall be either purchase by the city or by a private company designated by the city. The third bill is the one which received the approval of the railway companies' attorneys. This measure does not provide for amortization of the properties or for punishment of the company for any violation of the franchise within a year after the violation has been committed, although it does state that the permit may be revoked by purchase by the city or by another company designated by the city.

Some of the members of the committee are now favoring a 40-year term franchise under which the companies have admitted they could properly finance a consolidated transit system.

The amended consolidation bill which was expected to be passed in the aldermanic session following the companies' approval of it—like the terminable permit bills—is now being submitted to further study by the committee. This bill differs from the city's earlier draft in that it allows for the acquisition of the existing surface and elevated lines by an entirely new corporation or holding company.

Court Acts on Interborough Labor Issue

Justice Wasservogel decides contract between men of New York Company and management is unfair—President Hedley promises review of findings

THE Interborough Rapid Transit Company, New York, lost its injunction suit on Feb. 15 to restrain the American Federation of Labor and the Amalgamated Association from organizing the subway and elevated men. Supreme Court Justice Wasservogel decided that the contract between the Interborough and its men was unfair and that a court of equity would not protect it.

Justice Wasservogel also denied the Interborough's application to punish James H. Coleman, general organizer of the Amalgamated, for contempt of court for violating the injunction granted a year ago in the previous litigation to prevent unionization of the subway and elevated men. The court ruled that because the Court of Appeals had vacated the injunction before the contempt plea was made, on the ground that "its broad scope was beyond the power of the court," the restraining order was then a nullity. Decisions both of the Court of Appeals and of Chief Justice Marshall of the United States Supreme Court were quoted in support of this ruling.

In refusing the new injunction against the American Federation of Labor and the Amalgamated, Justice Wasservogel relied to a great extent on the Court of Appeals' holding in the Lavin case, brushing aside the contract signed last summer by the members of the Interborough company union, the brotherhood of the Interborough Rapid Transit Company, under which the members ceased to become mere employees "at will," but were signed up by the company for a two-year period.

In discussing the contract Justice Wasservogel said:

While plaintiff claims that the present contract involves mutual rights and obligations and was therefore made upon ample consideration, it is the contention of defendants that it is without consideration and because of the conditions to which it was made subject, should fail in equity. Defendants call attention to the fact that the separate ratifying instrument is signed by the employees and does not contain any promise by the company to employ the men for any period of time; that it was not executed by the company, and any promise of the company to employ the men for a period of two years must come through the general committee of the brotherhood which, by the terms of the constitution of the brotherhood had the power to bind the men. Assuming, however, that the promise contained in clause 1 of the contract between the company and the brotherhood with respect to an employment of two years was actually made by the company to the men, it seems to me that such promise is practically made valueless to the employees by clauses 5 and 6 of this contract.

Justice Wasservogel said in part:

The contract purports to bind the employee for two years, while the employer is not in substance subject to a reciprocal obligation. Where an employee abandons all right to leave the service of his employer, whereas the employer reserves practically entire freedom to discharge him, there is no compensating consideration.

Whatever the status of the contract at law, the provisions above referred to are, to say the least, inequitable. The term of the contract is, in effect, controlled by the will of the employer and plaintiff is therefore in no better position than it was in the Lavin case. Not only the employees but also the third parties made defendants in this case may, in a court of equity, avail themselves of the defense interposed.

The allegations of the Interborough were that the defendants had organized Division 977 of the Amalgamated for

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the purpose of bringing into it the subway and elevated employees and thus to "destroy" the Interborough Brotherhood, and that plaintiff's employees were being induced to "secretly violate their contracts of employment and become members of the Amalgamated while ostensibly remaining faithful to their obligations as members of the brotherhood."

The defendants denied these allegations and set up the defense that "the two-year contract is void and unenforcible by reason of alleged fraud, deception, duress and overreaching conduct on the part of the plaintiff."

James L. Quackenbush, counsel for the Interborough, announced Feb. 15 that the company would appeal.

Frank Hedley, president and general manager of the railway, said:

> The law department of this company will take steps to obtain a review of the recent decision denying an injunction to restrain interference to procure members of the brotherhood to break their agreements. In the meantime every member of the brotherhood is assured that it is the intention of the management to live up to the agreement in every way.
>
> The agreement between the brotherhood and the company is plain that no Amalgamated members can remain in the employ of the company. That agreement will be carried out by the company so long as the existing contract lasts. It is not intended to permit a small group of misguided employees to dictate terms to an overwhelming majority of loyal employees.

Celebration in Oklahoma City

Oklahoma City's first street car was piloted through the streets of Oklahoma City by L. B. Poulson on Feb. 15, celebrating the 25th anniversary of the first trolley service in the city. The car was placarded in recognition of the event and attracted much attention. The first street car in charge of Poulson, clattered down Broadway on Feb. 15, 1903. The system at that time consisted of 5 cars and 5 miles of track. The Oklahoma Railway now has 140 miles of track 129 cars, including interurban and 34 buses.

Safety Results Improved in Providence

Total accidents on the lines of the United Electric Railways, Providence, R. I., in 1927 decreased 8.9 per cent from 1926 or 641. Collisions with autos decreased, during the same period, 14.8 per cent or 549, this latter in the face of an increase, in round figures, from 112,000 to 120,000 in automobile registrations. In the large proportion of major accidents the trend was downward as it has been since 1923. In 1927 the cars ran an average of 3,811 miles per accident each month, and the buses an average of 9,509 miles.

Although the company regrets the increase in fatal accidents and collisions between its cars, it is gratified that employees' accidents in 1927 decreased 11.9 per cent over 1926.

Fare Increase to Be Asked in Shreveport

Capt. H. B. Hearn, president of the Shreveport Railways, Shreveport, La., has announced that the board of directors has decided to appeal to the Louisana Public Service Commission for an increase in car fares. The present fare is 7 cents for adults and 3½ cents for school children.

In a formal statement, Captain Hearn declares that the company's net earnings last year were $69,634 "on a property investment, valued by eminent utilities engineers to be $2,804,884 at a minimum." After deductions of $51,037 for interest on borrowed money, the statement continues, the company had $18,597 left for improvements or dividends. The statement follows in part:

> We have made a sincere and honest effort to operate successfully on the 7-cent fare for adults, and 3½ cents for school children. At the end of the last year we found that we had net earnings of $69,634 on a property investment, valued by eminent utilities engineers to be $2,804,884 at a minimum. After a deduction of $51,637 for interest on borrowed money, we had only $18,597 left for improvements or dividends. In short, the return was only approximately 2½ per cent, whereas the recognized fair return is 8 per cent.
>
> The revenues under the 7-cent fare make it absolutely impossible for us to meet the demands for service required by this growing community. We believe that when the people of this community are fully acquainted with the facts of the case, they will agree that our petition for an increase in the rate of carfare is fully justified.
>
> We must remember that the system of the Shreveport Railways of today has been evolved at heavy expense from a small, inferior transportation medium into a service utility extending over 35 miles of track. The equipment of the company is of the latest design. The maintenance of the property has always won the admiration of men familiar with transportation problems and attending costs.
>
> Everything has been done by this company to insure to the people good service. But conditions are such, under the present rate of fare, as to make it mandatory for us to seek relief in the form of an increase.
>
> It will be impossible for us to continue to operate successfully, and on a high basis of efficiency, unless we are afforded such relief as the condition warrants.
>
> We are now compiling complete statistics and records which will place the entire case before the commission, and we intend also to acquaint the public with these facts, that they may judge whether our petition is justified. We believe that the judgment of the fair-minded people will be that we are warranted in seeking this relief.

Co-operation in Omaha Means Improved Service

Extra railway service for the convenience of the workers in the south side packing plants of Omaha, Neb., is now provided daily at the hour of dismissal through the co-operation of the packers and the Omaha & Council Bluffs Street Railway. The special service was arranged at a conference with C. A. Cushman of Swift & Company, and W. C. Baughman, representing the railway. As the packing plant employees did not end their day's work at a given hour each day Mr. Cushman asked if the company could not supply extra cars no matter what the closing hour. Under the arrangement now in force Mr. Cushman's office notifies the railway each day at the release hour of the workers.

In this connection the improvement of the south side service followed a suggestion from outside of the company.

And Lo! Richmond Led All the Rest

Advertisements carried by the Virginia Electric & Power Company, Richmond, Va., in the *News Leader* for the period of one month were awarded first place in a competition with advertisements of 32 large utilities under the management of Stone & Webster. At the close of each month the Stone & Webster managed companies forward copies of all advertising matter put out by them to the company's home offices in Boston, Mass. These are analyzed by the McJunkin Advertising Company, of Boston, and the ratings announced.

In a letter received from the McJunkin Company on Feb. 14 the Virginia Electric & Power Company was notified that it carried the largest volume of advertisements of any one of the Stone & Webster companies and the advertisements were noted for their effective, terse language and their pleasing appearance.

Injunction Against Parking Refused

Attempts of dissatisfied business interests to obtain an injunction against enforcement of the no-parking ordinance, which is now in its second month's trial, on downtown streets of Chicago ended suddenly on Feb. 18 when Superior Court Judge Oscar Hebel granted a motion to dimiss the bill of complaint. In denying a temporary injunction against the ban on Feb. 11, Judge Hebel had allowed the petitioners one week in which to file an amended bill.

The reason given for the withdrawal of the complaint by Samuel Pancoe, a "Loop" stationer who had headed the small group opposed to the law, was that the task of assembling evidence would require too much time and entail excessive expense.

An alternate plan of carrying to the Supreme Court a test case of a person arrested for violating the ordinance is said to be under consideration by attorneys for the dissatisfied merchants. This procedure, it was pointed out by the attorneys, would be much less expensive than to test the legality and reasonableness of the ordinance in the superior court.

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Inquiry by Trade Commission

Walsh resolution amended. Investigation will concern itself with interstate companies

THE Senate, by a vote of 46 to 31, on Feb. 15 sent the utilities investigation to the Federal Trade Commission, thereby defeating the proposal of Senator Walsh for a Senatorial inquiry. The vote was on the amendment to the Walsh resolution offered by Senator George. After that, the amended resolution was adopted without a record vote.

The resolution as passed, in addition to the provision calling for monthly reports to the Senate, also authorizes an inquiry into alleged political activities of corporations concerning the public ownership question and elections since 1923 for president, vice-president and members of the Senate. Another provision is that the commission shall ascertain whether any of the alleged practices referred to in the resolution constitute unfair methods, tend to restraint of trade or to create a monopoly or violate the anti-trust laws. Another provision is that the sessions shall be open to the public.

The report of the Senate interstate commerce committee on the Walsh resolution was debated in the Senate on Feb. 13, 14 and 15. Senator Walsh led the argument for adoption of his resolution. He said the committee's restriction upon the inquiry to interstate business and companies with interstate connections was satisfactory, as it was never intended that the proposed committee should inquire into plants of small communities. However, he opposed the restriction that public utilities' campaign contributions to be inquired into should be limited to the elections of President, Vice-President and members of the House and Senate.

Senator George, having offered an amendment that the inquiry be made by the Federal Trade Commission, was the principal backer of this proposal. The proposition of Senator George included a provision that the Federal Trade Commission should report to the Senate within each thirty days after the passage of the resolution, and, finally, on the completion of the investigation.

On Feb. 13, Vice-President Dawes, as president of the Senate, explaining that he was financially interested in various public utilities, asked the Senate to amend the Walsh resolution so that appointment of the special investigating committee would be placed in other hands than his. Senator Walsh gave his assent to this, saying that he would ask that the special committee be elected by the Senate.

Five Lost on Key System Ferry

Official investigations into the Key System Transit Company ferryboat tragedy have ended and reports will be made next week. Five are believed to have been drowned when the ferryboat Peralta, loaded with commuters on the way back to Oakland from San Francisco, suddenly plunged downward and shipped considerable water on Feb. 17. Twenty-one were washed overbroad from the forward deck, but 16 were rescued. Of the 5 lost, 3 were men and 2 women. No bodies have been recovered.

Government steamboat inspectors in an attempt to fix the blame, called many witnesses, including officials of the company and passengers.

New safety precautions have been instituted on the Yerba Buena, sister ship to the Peralta, in accordance with an order of John K. Bulger, supervising inspector of steamboats. Hereafter chains will keep passengers 40 feet from each end of the boat during trips and use of ballast, or trimming tanks will be discontinued. These rules will also apply to the Peralta when she returns to service. The tanks were blamed for the accident by many witnesses. It was claimed that the forward tank of the Peralta was filled with water when the accident occurred and that the weight of this water, plus the weight of the passengers who crowded forward as the craft neared the Oakland mole caused the Peralta to do a "nose dive."

Key officials denied that the tank was full. They declared that it had never been used for ballast purposes.

Fare Injunction Argued in New York

Counsel for city and the commission contends statutory court required—Counsel for company that federal jurisdiction be established

THE hearing on the temporary order granted by Federal Judge Winslow to the Interborough Rapid Transit Company, New York, restraining procedure under the State Supreme Court injunction was held on Tuesday before Federal Judge William J. Bondy. William L. Ransom, counsel for the Interborough, and Samuel Untermyer, for the city and the Transit Commission, argued as to whether the hearing should be before one federal judge or in a statutory court consisting of two federal judges and a judge of the Circuit Court of Appeals.

Mr. Untermyer raised the question of procedure to be followed. He contended that under congressional law a single federal judge could not hear and continue a temporary injunction which sought to displace state courts as having jurisdiction. He argued that the law required a statutory court of three federal judges to hear the motion. He said that "if these people are successful in holding up the city's action in state court, then the railroad 'has a royal road' on March 3 to a 7-cent fare."

Gist of the Company's Plea

Judge Ransom stated the company's original complaint filed in Federal court established the Federal court's jurisdiction. He argued the original complaint was sufficient and not premature. The second proceeding by the company, that of getting a temporary injunction, he argued, was a separate move; that it relates only to and shows "acts by these defendants, subsequent to filing of the original bill in Federal court, which appears a deliberate plan amounting virtually to conspiracy, seeking to deny the company an orderly hearing before the court in seeking relief."

In later remarks he said the motion was simply to force the defendant to show cause why they should not be enjoined from prosecuting the actions which they began in the Supreme Court of New York County. According to Mr. Ransom it was simply a question of the priority in time of the filing of the action. All the points of the State court suit are included in the action pending in the Federal court, he said, and declared that the real purpose of the defendants in getting into the Supreme Court was to gain some device by which they could restrain the Interborough from coming to the Federal court and getting protection from confiscatory proceedings. He said there was no question of the priority of the Federal court's suit, as it was filed at 9:20 a.m. Tuesday, Feb. 14, while the suits in the State court were not filed until after 12 o'clock. Under these circumstances Mr. Ransom said, the Federal court had no option but must assume full jurisdiction.

Mr. Untermyer said he asked the courts to decide that the city suits were begun first. He said the Transit Commission had taken two weeks to pass on the Interborough's application and that it did not act sooner because it was disturbed by the question whether it had a right to act under the city contract with the Interborough. The court asked Mr. Untermyer whether there had been any cases in which the question of contracts has been raised in rate-making actions. There have been many of them, Mr. Untermyer answered, particularly the Columbus Railway case which was decided by the United States Supreme Court. In this case, the company was losing money, not even making operating expenses, while the I.R.T. is making money.

On Feb. 23 Mr. Ransom filed in the United States District Court a reply affidavit answering briefs filed on behalf of the city and the Transit Commission in their opposition to the suit now pending in the Federal court.

Mr. Ransom's affidavit is, generally, a repetition and summary of assertions made to him in the course of argument Tuesday before Federal Judge William Bondy. He lists five facts which he says neither the Corporation Counsel nor

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the counsel for the Transit Commission has denied. The facts have been summarized as follows:

1. That the Interborough's suit was started in Federal court before the authorities filed in the State courts.

2. That the commission and the city started their actions for the purpose of preventing the Interborough from making an application for a special statutory court and from taking other steps in the Federal action.

3. That the schedules embodying the increased fare were duly filed with the Transit Commission by the company and are still on file.

4. That the 5-cent fare is "grossly inadequate, and in fact confiscatory."

5. "That at least $142,894,000 of present value of the elevated properties are being daily confiscated by the inadequate earnings under the 5-cent fare; that $140,579,474 of property owned by the plaintiff and $272,940,174 of other property provided by the plaintiff is being confiscated by the 5-cent fare; and that not more than $342,380,000 of the total of $898,793,648 of the present value of rapid transit properties used in the plaintiff's business was provided by the city of New York."

The city and the Transit Commission secured a temporary injunction from Supreme Court Justice Edward J. Glennon on Feb. 14 restraining the Interborough from increasing its fares to 7 cents. Procedure under this injunction was stayed by a temporary restraining order issued to the company by Federal Judge Winslow on Feb. 17. The latter restraining order is effective for 10 days or until Feb. 27. The question for Judge Bondy to decide is whether he had jurisdiction in the matter and if so whether the restraining order should be continued. If the Federal Court's temporary restraining order is continued, then the company will probably ask for a temporary injunction permitting it to charge a 7-cent fare pending decision on its original application asking for a permanent injunction.

Hearing on Use of One-Man Cars in New York City

The operation of one-man cars by surface railways in New York City will come before the Transit Commission at a public hearing on Feb. 29, called on recommendation of the service bureau and the chief engineer. According to the report made to the commission by the service bureau, some of the companies have started or extended one-man car operation without due notice to the commission. At the present time 1,404 one-man surface cars are being operated in the city. The commission seeks to have all of these cars equipped with more safety devices, and to compel the railways to notify the commission before starting or extending one-man car operation on any of their lines so that the commission may approve any plans for changing equipment of cars for one-man operation or of the routes over which one-man cars are to operate.

More Moves to Speed Up Traffic in Detroit

At a meeting held with the Mayor, Common Council and interested department heads on Jan. 24, the Commissioner of Public Safety at Detroit, Mich., suggested that a 30-day test be made on Woodward Avenue between the River and Fair Grounds during which time the street cars would make express stops between Adams Avenue and the Six Mile Road; local stops between the River and Adams Avenue and between the Six Mile Road and the Fair Grounds; and the buses would make local stops between the River and the Six Mile Road. It is believed that a combined service of this kind would materially expedite the flow of all types of vehicular traffic on any street where trolley cars are operated. In this connection it will be recalled that a combination express street car and local bus service was placed in service on East Jefferson Avenue under date of Sept. 18, 1927.

AVERAGE VEHICLE SPEEDS ON WOODWARD AVENUE AS DETERMINED FROM TESTS

	3:30 to 6:30 P.M. Northbound Thursday, Dec. 9, 1926 M.P.H.	7:30 to 10 A.M. Southbound Saturday, Dec. 18, 1926 M.P.H.
Jefferson Ave. to Fort St.	5.8	7.0
Fort to Grand River	4.4	8.3
Grand River to Adams	5.7	7.0
Adams to Columbia	4.6	4.5
Columbia to Eliot	7.6	12.0
Eliot to Warren	8.3	9.6
Warren to Grand Blvd.	9.5	12.9
Grand Blvd. to Clairmount	12.3	14.0
Clairmount to Tuxedo	15.8	17.0
Tuxedo to Davison	13.4	17.0
Davison to Six Mile Road	10.2	14.5
Six Mile Rd. to Seven Mile Road	13.0	15.5
Seven Mile Road to Fair Grounds	12.2	15.2

G. C. Schink, inspector, director of traffic for the Detroit Police Department, on Jan. 26, in a bulletin on the general features of the traffic situation from the police department's traffic survey bureau report, said:

We believe that "rush hour" traffic (to the Loop District in the morning and outbound in the afternoon) should be given special prference by keeping open for moving vehicles the full width of pavement in the direction of the greatest traffic movement. This is provided for by the present ordinance but is not yet satisfactorily observed although conditions are improving.

Slow moving vehicles obstruct traffic, diminish the number of vehicles that can pass a given point in a given time and increase the amount of passing of one vehicle by another, thus adding to confusion and danger. Certain vehicles, such as heavy trucks, which inherently must proceed at slow speed are required to travel close to the curb. This requirement is fairly well observed but fails to solve the problem of interference with free movement caused by the presence of othr slow moving vehicles.

Street cars using the natural highest speed lane and operating on a local stop service become slow speed vehicles and in view of the ordinance requiring other vehicles to stop with them, have a very definite retarding action on all other vehicular movements.

Various writers on traffic matters point out that the maximum results in the flow of vehicles along a thoroughfare are obtained when vehicles move at a rate of speed between 15 and 25 m.p.h. On Woodward Avenue, for example, tests show that the average vehicular section speeds are considerably lower. This necessarily means that the most economical use of the roadway is not being attained. Other thoroughfares on which street car lines are located, show similar conditions.

Safety Bonus in Houston

The Houston Electric Company, Houston, Tex., has announced that beginning Feb. 1 all operators of cars and buses who are not charged with an accident during the month will receive a bonus of $5. It is expected that the 460 men on the company's pay roll will receive about $25,000 through this bonus. During 1927 accidents decreased 12½ per cent, compared with the number reported during 1926. Last year the number of miles covered by buses and street cars increased more than 8 per cent compared with the preceding year. Accidents for which operators are not responsible will not be charged against their records.

Transportation in Other Lands

A description of transportation in other lands is being published in the British Columbia Electric *Employees' Magazine* from a copyright illustrated travel talk by P. Bentley, Dominion Photo Company, Vancouver. Mr. Bentley has granted special permission to the *Employees' Magazine* to run these articles. The fourth of a series appeared in the February number. His talk on freight transportation in India was prepared by him while on board the R.M.S. "Empress of Canada" during a world tour.

Safety Posters in Indianapolis

A series of safety posters will be placed on the cars of the Indianapolis Street Railway in Indianapolis, Ind., in an effort to curb automobile accidents this year. The cards will be replaced with different ones weekly.

Veterans Awarded Emblems in Atlanta

Nine 40-year men of the Georgia Power Company, Atlanta, Ga., were recently decorated with diamond buttons indicative of their loyalty and service. In ceremonies which marked the award of emblems, officials of the company paid high tribute to the faithful men. Beginning with exercises in December when 714 Atlanta employees, with ten or more years of continuous service were given their buttons, a total of 926 employees throughout the state were decorated during the course of the same week in similar exercises at various district headquarters.

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Singing the Song of the Trolley in Grand Rapids

Having the praises of the railway, its rail coaches and its service sung by an entire city to the accompaniment of the leading orchestras is the new good will and publicity program launched by L. J. DeLamarter, vice-president and general manager of the Grand Rapids Railroad.

When the Grand Rapids company placed its new electric rail coaches in service it also launched a new slogan to go with them "Don't Worry! Relax! Ride the Street Cars. The Safest Place in Town."

Other local advertisers adopted the "Don't Worry! Relax!" part of the slogan to tie to their own publicity until the slogan practically became a household word.

One day recently, Mel Gilleland, director of the leading orchestra in the city, scribbled off a verse that he believed fitted in well with the slogan and showed it to Mr. DeLamarter. He revised his work and then the orchestra director set the words to music, a catchy and tuneful melody that offered opportunity for pleasing syncopation by orchestras:

RIDE THE TROLLEY CARS!

Don't worry! Don't hurry!
Relax; ride the trolley cars
The safest place in town.
Don't worry! don't hurry;
Ride and be merry.
Happy friends will meet you there.
Smile, and the world smiles with you,
Frown and you frown all alone.
So don't worry! Don't hurry!
Relax and ride the trolley cars,
The safest place in town.

Without previous announcement Mr. Gilleland sprang the song a few nights later at a large dance. It proved a "hit." There was a demand for encores. Other orchestras asked permission to use it and Mr. Gilleland cheerfully dedicated his song and music to Mr. DeLamarter and the railway. Then it received city-wide and free distribution. Now it is being sung and played by the orchestras in dance halls, theaters and other public places, while in hundreds of homes small groups gather around the piano and sing the words.

Another Transit Plan Proposed for New York

Public ownership of all transit facilities in New York has been proposed by Comptroller Charles W. Berry in a report to the Board of Estimate.

He would have the city take over all subway, elevated, surface and bus lines, which eventually it would own outright. The city would control all finances and the operating company would be under municipal supervision.

A 5-cent fare would be compulsory for three years. At the end of that time, if a deficit were shown, the Board of Estimate would decide either to try the experiment for three years more or submit the fare increase to the voters.

Among the outstanding features of the plan are:

1. Absolute control by the city of New York of its transit facilities—subways, elevated, surface and bus lines—and all revenue derived therefrom above actual expenses of operation.
2. Ultimate ownership by the city of New York of all transit lines with the right to remove or replace any line at any time.
3. A 5-cent fare with adequate transfer for a unified interborough service embracing all subways, elevated, surface and bus lines which are rendering necessary service or may be needed for a comprehensive transit system.
4. Consolidation in one body of all commissions having supervision over transit activities with corresponding economy of administration, improvement in service and elimination of jurisdictional disputes.
5. Construction of necessary bridges or tunnels between the boroughs of the city.

Wage Increase in Baltimore

An increase of 1 cent an hour for all platform men and a 2 per cent increase for all salaried employees was announced recently by the United Railways & Electric Company, Baltimore. The increase dates from Feb. 13 when the new fare rate of 9 cents or three tokens for 25 cents went into effect. In this order $260,000 was allowed for wage increases this year. Under an agreement the company had with its employees similar increases were granted the first of this year. Trainmen are now receiving 55 cents an hour.

Officials of the company and representatives of the employees held a conference in 1926 and following this the company contracted to grant increases on Jan. 1, 1927; on Jan. 1, 1928, and a proportionate increase at any time a raise in fare was granted. Charles D. Emmons, president of the United, has pointed out that platform men were receiving 22 cents an hour in 1916. The two increases granted this year amount to about $130,000 for platform men and about $130,000 for salaried employees.

Alameda Lines to Be Restored

The Key System Transit Company, Oakland, Cal., has been authorized by the California Railroad Commission to re-establish railway service on certain portions of its San Jose Avenue and High Street lines in the city of Alameda. Discontinuance of these portions was authorized by the commission recently during a 90-day experimental period for the operation of buses.

Enviable Safety Record in Philadelphia

A reduction of 15 per cent in all types of accidents in 1927 over the record of 1926 was effected by the Philadelphia Rapid Transit Company, Philadelphia, Pa., in its handling of trolleys, buses and cabs. There were fewer car collisions and a general reduction in the number of accidents on all the surface lines. The record of one-man cars was better in this respect than that of two-man cars.

Scioto Valley Line Tells of Service to Theater

The Scioto Valley Railway & Power Company, Columbus, some time ago took advantage of a combination of circumstances to put over a very effective newspaper ad in connection with the opening of the Loew's and United Artists' Theater in Columbus, Ohio. By means of the electric railway persons living in the most distant towns reached the theater within a few hours.

The ad, which is shown herewith, tells of the new chair cars recently put in service by the company, together with the many other features installed in recent months. In addition the ad contains a picture of Gloria Swanson, one of the United Artists' stars, affiliated with Mr. Loew in the management and direction of the theater.

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$47,000,000 in Loans Before Philadelphia Voters

Voters at the April primary in Philadelphia, Pa., will be asked to approve several loan bills, totaling $47,000,000. They also will have for consideration a referendum transferring the $10,000,000 loan of 1913 for the Chestnut Street subway to another purpose.

Largest of the loan items is $10,000,000 for the extension of transit facilities. Of that amount $6,000,000 will be for the structural changes at City Hall station of the Broad Street subway, including the proposed concourse, and $4,000,000 will be spent for the Ridge Avenue delivery loop.

Sightseeing and Route Guide of Chicago

The Chicago Surface Lines has issued a new sightseeing and route guide of the system. The booklet, 5x8½ inches, contains 36 pages with a folder map in four colors showing the entire system. It is profusely illustrated. Directions are given for reaching all important points of interest by street car and a complete description of all of the routes of the system is included.

A feature of the distribution is the compilation of the dates of approaching conventions with the name of the secretary of the organization. A month before the convention is to meet, samples of the book are forwarded to the secretary with the suggestion that copies are available to the delegates. In this way practically all who come to the conventions are supplied with street car route guides. The booklet is being distributed free through the medium of railroads, hotels and public service offices.

Transfer Changes in Indianapolis Continues

Continuance of the present 2-cent transfer charge of the Indianapolis Street Railway, Indianapolis, Ind., for an indefinite period from March 1 is asked in a petition filed by the company with the Indiana Public Service Commission. The commission extended the privilege about a year ago following its authorization of the charge in 1925 to assist the company to bolster up its depleted finances. The company states similar conditions affect the property.

New Schedule in Terre Haute Sought

Permission has been asked of the City Council at Terre Haute, Ind., by the Terre Haute, Indianapolis & Eastern Traction Company, to lengthen its schedule on all city car lines and to stop the regular schedule after 11:30 o' clock p.m. The request is made to enable the company to cut down operation expense rather than to raise the fare charge. It is estimated that if the change is granted, a big saving will be made each month. The schedule, as requested, would start the first morning car on all city lines at 5 o'clock, with a second at 5:30. Then cars would start operating in all directions on a basis of no less than eight minutes nor more than twelve minutes.

Fare Increase in Tulsa

An increase of 3 cents in single cash fare was granted the Oklahoma Union Railway in Tulsa, Okla., on Feb. 15, by the Corporation Commission. The increase makes a single fare of 10 cents or three checks for 25 cents, which is the same rate charged on the buses of the Union Transportation Company of Tulsa, a subsidiary of the Oklahoma Union Railway. The old fare was 7 cents or four checks for 25 cents. No protest was offered and the commission granted the increase from the bench. The company, in its application for a fare increase, alleged that it lost $377,152 since 1923.

San Antonio Boasts of Service Record

In its elimination of delays the San Antonio Public Service Company, San Antonio, Texas, boasts of its 1927 record. There was an average of 24 delays a day in 1926, against ten a day last year. The cars traveled about 3,500,000 miles in 1927 and during the entire year were delayed only 3,650 times. These were consequent to parades, traffic congestion and automobiles. Figured in another way the statisticians declare that for every person annoyed or inconvenienced by street car delays in 1927 more than 419 enjoyed practically perfect service.

Fare Bill Favors Norfolk

The City Council of Norfolk, Va., has approved a bill to be introduced in the General Assembly confirming the power of the State Corporation Commission to exercise jurisdiction over services and rates of the Virginia Electric & Power Company in its operation of the electric railways in Norfolk.

The right of the State Corporation Commission to fix rates and prescribe services for electric railways in Virginia has been upheld by the Supreme Court, but the Norfolk city charter has a provision at variance with the Supreme Court's ruling in the matter. The purpose of the bill approved by the Council is simply to remove this discrepancy so that the railway's bonding power will not be reduced.

Foreign News

Poland Completes New Electric Railroad

Operation of the new electric railroad between Warsaw and Grodzisk, Poland, was begun recently. This is the first electric railway to be constructed in the country of Poland since the World War.

The distance between the two towns is 33 km. (20½ miles) and the scheduled running time is 66 minutes, with two trains per day each way. The cost of a one-way ticket is 2.30 zlotys (approximately 25 cents), but it is expected that the tariff will be reduced shortly and the service augmented.

The line was constructed and is operated by the Soc. Anon. Silia i Swiatlo (Power and Light Company). British and Belgian interests are closely allied with the Polish company and most of the equipment has been purchased from the countries named.

Individual Good Relations Work

The London Underground Electric Railways has recently been conducting a house-to-house canvass among its commuters, to collect suggestions for improvement. The calls are made by inspectors who are men carefully chosen for their tact and other necessary qualifications. In one district, they made 13,000 calls, and in another, 1,100. They make their visits in plain clothes, generally in the evening, when it is expected that the head of the family will be at home.

Siam Electrification Completed

The Societe des Tramways et Electricite de Bangkok has lately completed the work of electrifying the Paknam, Siam, steam railroad. To supply the necessary electric power a new 5,000-kw. steam turbo-generator has been installed.

Latest British Traction Contracts

Among the latest contracts placed in Britain for electric railway equipment is a repeat order of the Sydney Suburban Railways for motor-coach and trailer-coach equipments from the Metropolitan Vickers Electrical Company. The motors, two for each motor coach, are units of 360 hp.—probably the most powerful individual motors ever installed for multiple unit trains. Another order from the Sydney Suburban Railways is for more than 100 control equipments for converting non-driving into driving motor coaches. For the Dutch Railways a repeat order has been received for. 50 motors, complete with gears, further control equipments, pantographs, and various details. The motors are of 210 hp. each, for operation at 1,500 volts.

Following the order placed in January, 1927, for 104 motors of 230 hp.

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each for the Barcelona-Manresa electrification of the Norte Railway of Spain, a further order has now been placed for similar motors for the 1,500-volt electrification of the Irun-Alsasua section. As in the former case, the coaches will be manufactured by the Sociedad Española de Construcción Naval (the Spanish Associate of Metropolitan Vickers) at its Bilbao works.

Edinburgh Adopts Upholstered Seats

Refitting of the top decks of 162 tramcars with upholstered seats has been authorized by the Edinburgh Tramways Committee, Edinburgh, Scotland. Thirty cars also are being fitted with transverse upholstered seats in the lower saloons. Mr. Pilcher, the tramways manager, said that everything should be done to keep the cars attractive and up to date, and that the Tramways Committee should not hesitate to spend money in improving the rolling stock.

First Subway in Far East Opened in Tokio

The first electric subway train service in the Orient was opened in Tokio on Dec. 30 last. The line has been constructed on the pattern of the New York system, and is claimed to be earthquake-proof. At present this subway is 1½ miles in length. It connects the railway terminus of Ueno with the pleasure quarter of Asakusa. It will eventually be extended for 9 miles westward into the suburbs.

International Exhibition at Liege

An international exhibition of the heavy industries will be held at Liege, Belgium, in 1930. It will celebrate the centenary of the independence of Belgium. Railways and transportation will be included, and there will be an exhibit of electric railway equipment and apparatus.

May Combine in Glasgow to Meet Bus Competition

Steam and electric railways may combine forces in Glasgow in an effort to adopt a scheme to control passenger traffic because of the competition on the bus lines. The London, Midland & Scottish Railway and the London & North Eastern Railway, which between them own and work all the steam railways in Scotland, have applied to the Glasgow Town Council for a conference to discuss the terms of a possible alliance between the parties for the purpose of defending the railways and tramways against bus competition. To do this the letter suggested the adoption of some method of co-operation for the control of passenger traffic. The tramways committee appointed seven of its members to meet representatives of the railway companies as requested in an effort to find a solution.

Recent Bus Developments

Staggering the School Load in British Columbia

Officials of the traffic department of the British Columbia Electric Railway, Vancouver, B. C., have been facing a very big transportation problem since the autumn of 1925 when the University of British Columbia moved to its permanent site. A service of motor coaches was started to connect with street cars at the Sasamat terminus and special low rates were arranged. The big difficulty arises from the fact that 1,700 students have to be transported from the railway terminus to the University in approximately 30 minutes each morning during the term. The traffic is light during the rest of the day as the students leave at different times. It would therefore be a considerable loss to operate a sufficient number of coaches to handle the rush traffic during the morning period, as these vehicles would have to be purchased specially and would be idle for more than twenty-three hours during the day, and for the entire time during vacation periods.

The officials of the University laid their case before the faculty of the University and suggested that the term which students travel be extended by fifteen minutes. It was a matter of indifference to the British Columbia Electric Railway whether this change in arrival time be made to an earlier or a later hour, so long as it would serve the purpose of spreading the arrival time of students at the University before 8.45 a.m. upon mornings that their timetables include lectures in English 1, physics 1, or physics 2. This arrangement will be tried for the period of one month.

Dean Coleman, on behalf of the faculty, has recently written to the railway and expressed the appreciation of the authorities to the excellent service maintained by the company during the recent snow. He states that the faculty feared it would be impossible to hold the examinations before Christmas owing to the difficulty of running coaches during the heavy snow, but because of the manner in which service was maintained the examinations were held as usual.

Extension in St. Louis Approved Despite Railway Objection

Approval of the extension of the Kings Highway line of the People's Motorbus Company from Penrose Street northward to Florissant Avenue was given by the St. Louis, Mo., Board of Public Service on Jan. 24. The extension of the bus line had been opposed by the St. Louis Bus Company and the St. Louis Public Service Company, as the territory served by the buses is in the path of a contemplated extension of the Lee Avenue division of the railway company.

Bus Ordinance Passed in Berkeley

The City Council of Berkeley, Cal., has approved an ordinance to allow a revocable permit to bus interests, the ordinance to become effective in thirty days.

Several months ago such permission was sought from the Council by a company headed by Postmaster Charles D. Heywood, which stated it would install a system of thirty buses, operating over six districts of Berkeley to connect with the Golden Gate Ferry in West Berkeley, with an 18-cent fare.

The bus line officials held that their system would reach territories not now served by other systems, and would offer frequent service to outlying residential districts.

The new ordinance provides among other things that an application for a permit must specify general routes to be served, the minimum schedule of operation and the various transfer points. The Council is to decide if the need for such service is imminent, and may then issue a permit with a revocable clause. In return for the permit the bus company must pay the city $10 each month or portion of a month for each bus in operation and must carry fleet insurance to the extent of $100,000 and post a surety bond of not less than $10,000.

Both the Southern Pacific Company and the Key System Transit are opposed to the granting of the permits to bus companies.

Jersey Bus Line Sold

The Public Service Co-ordinated Transport is now operating the bus lines of the Morris County Traction Company, the sale of the latter company to the Public Service by the bondholders' committee having been approved on Feb. 20 by the State Board of Public Utility Commissioners. This opens a new territory for Public Service transportation lines extending from Newark to Netcong and embracing upwards of 25 communities with an approximate population of 145,000 persons not including Newark and Maplewood. At present 40 buses will serve the territory.

Some of the principal communities through which they run are Netcong, Stanhope, Port Morris, Ledgewod, Mine Hill, Wharton, Dover, Rockaway, Denville, Mountain Lakes, Boonton, Mount Tabor, Morris Plains, Morristown, Convent, Madison, Chatham, Summit and Newark.

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Would Substitute Buses on Line in Gadsden

Authority to abandon railway service on Ewing Avenue, Gadsden, Ala., and to establish a line of buses instead has been asked by the Alabama Power Company of the Alabama Public Service Commission. The company agrees to pay $5,000 towards paving this street. It is claimed that cars over this line no longer pay.

Hearing on Pasadena-Long Beach Service Adjourned

The hearing before State Examiner Williams of the California Railroad Commission covering the question of through bus service between Pasadena and Long Beach by way of Atlantic Boulevard as proposed by both the Motor Transit Company and the Pacific Electric Railway has been adjourned to March 19 and 20 at the Los Angeles headquarters of the State Railroad Commission. During the hearing of Feb. 9 and 10, held at the City Hall in Pasadena more than twenty witnesses testified.

According to Deputy City Attorney Leonard A. Diethe, who appeared at the hearing, Pasadena is interested in the proposed routing of the buses and the question of applicants securing a franchise, rather than a certificate of public convenience and necessity from the State Railroad Commission.

Grant in Buffalo Opposed by Railway

The International Railway, and its subsidiary, the International Bus Corporation, Buffalo, N. Y., are opposing the granting of a certificate of convenience and necessity to the Van Dyke Motor Bus Company, Buffalo, for the operation of de luxe buses between Shelton Square and the American terminal of the Peace Bridge across the Niagara River in connection with the Buffalo, Fort Erie, Bridgeburg, Ont., interurban service. The railway contends that the bus riders are potential car riders and that there would be duplication of service from Main Street to the Peace Bridge terminal.

New Bus Law in New Jersey in Interest of Co-ordination

A bill has been drawn for introduction into the Legislature of New Jersey to bring about, under the jurisdiction of the Board of Public Utility Commissioners, the thorough co-ordination and unification of electric railway and bus services. Under the present law, electric railways may own and operate buses, but under the conditions imposed, such companies are in some respects considered as separate and distinct utilities, thus preventing complete and efficient co-ordination.

Further, whenever an electric railway substitutes buses for any part of its railway lines, it must now obtain consent for a definite number of buses, regardless of the changing needs of the public. The new bill would provide that in cases where buses are substituted for railway cars, the company, after obtaining municipal consent and the approval of the Board of Public Utility Commissioners, shall operate buses sufficient in number to furnish adequate service, subject, of course, to the jurisdiction of the Board of Public Utility Commissioners and under similar conditions as to revocation as apply to all other buses. This bill further provides the conditions under which rail service may be restored in cases where substitution is made.

Georgia Commission Would Assume Jurisdiction

The Georgia Public Service Commission has taken its first step toward the regulation of bus lines within the state with an order requiring all bus companies to report to it. The order is as follows:

All companies or individuals engaged in transporting passengers or freight over the highways and public roads within the state of Georgia between given municipalities and over the streets and highways of municipalities where fixed routes, schedules and rates are maintained are hereby required to file with the Georgia Public Service Commission, time-tables, schedules and tariffs, showing the service and rates or fares charged for such service over said highways and public roads within the state of Georgia and within municipalities herein enumerated.

Said statement showing service and rates shall also show whether such service has been performed by a corporation or individuals, the amount in all equipment used in such service and, if a corporation, where incorporated. Said showing shall also contain the amount of insurance, if any; the company in which such insurance is carried for the protection of passengers and freight entrusted to such corporation or individuals, and such other information as may be in the possession of such companies or individuals calculated to acquaint the commission with the conduct of the said corporation or individuals.

At two successive sessions of the Georgia General Assembly all attempts to pass legislation regulating bus lines in the state have met with failure, and the present order of the commission is an attempt to bring bus lines under the control of the Public Service Commission without legislative action. Whether this can be legally done is a question which the courts may be called upon to decide.

Already one coach company — the Atlanta Coach Company—has refused to pay its assessment for the support of the commission on the ground that the commission has no power to regulate bus lines in the absence of legislative action. And it is possible that this order will meet the similar opposition from other operators.

Tax of Interstate Buses by Connecticut Upheld

In a decision handed down on Feb. 20, the United States Supreme Court upheld the right of the state of Connecticut to impose a tax of 1 cent for each mile of highway traversed by buses engaged in interstate commerce. The Interstate Bus Corporation, which operates buses between Connecticut and Rhode Island, and to Massachusetts points, had sought in the lower courts to enjoin the State Tax Commissioner from collecting this tax, protesting that it was discriminatory and therefore unconstitutional. The ruling of the district court refusing to grant this relief is now upheld by the Supreme Court.

Justice Stone who handed down the opinion in this case expressed himself as follows regarding the contention that the bus company already contributed toward highway maintenance in its regular taxes:

That Appellant is already contributing to highway maintenance is not in itself significant because the State does not excede its Constitutional authority in imposing more than one form of tax as a charge for the use of its highways in interstate commerce. It is for the Appellant to show that the aggregate charge bears no reasonable relation to the privilege granted.

In concluding, Justice Stone said:

But we need not consider here whether the principle relied upon goes so far as to prevent the State from excluding from its highways, a motor carrier which refuses to pay charges for their use.

The fact that buses operating in intrastate commerce in Connecticut were exempted from this tax and paid instead a gross receipts tax, did not alter the opinion of the court.

Substitution of Line in Oakland Sought

The Key System Transit Company, which was recently authorized by the California Railroad Commission to substitute a bus line for its "Rockridge" Street railway line for an experimental period of 90 days, has applied to the Railroad Commission for permission to substitute a bus route permanently on this Oakland line. This route would make a connection with the Key trans-bay service.

New Route in Richmond Opened

A new bus route serving the Oak Grove section of Richmond on the southside and the teritory in the vicinity of the Richmond Cedar Works has been put into operation by the Virginia Electric & Power Company. The bus runs on a 30 minute round-trip schedule. Plans for the establishment of the new route have been underway for some time and service was commenced with the completion of street improvements undertaken by the city.

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Financial *and* Corporate

7 per Cent Preferred to Be Retired by Illinois Power & Light

It is proposed by the Illinois Power & Light Corporation, Chicago, Ill., to call and retire all of the 7 per cent cumulative preferred stock. For this purpose, it is expected that a formal call will later be issued to redeem the stock at $105 a share plus dividends.

In order to raise funds with which to accomplish this, the corporation proposed to create and sell a new class of preferred stock. This class will be without par value, will be preferred in involuntary liquidation at $100 per share and in voluntary liquidation at $110 per share, plus accrued dividends. The call price will also be $110 per share. The call price of the existing 6 per cent preferred stock, as well as its price on voluntary liquidation, will be likewise raised to $110. Otherwise, the new class will have substantially the same charter protection as the existing preferred stock.

This proposed refinancing plan is subject to action of the stockholders at a meeting to be held for that purpose on April 23 and to the approval of the Illinoise Commerce Commission. If adopted, it is expected to result in the following advantages to the company and its stockholders:

1. Most of the holders of the 7 per cent cumulative preferred stock will receive a substantial present profit;
2. The existing 6 per cent cumulative preferred stock (which will remain outstanding) should have its market value materially increased.
3. All holders of 7 per cent cumulative preferred stock will be given an opportunity to reinvest in the new $6 cumulative preferred stock, on a favorable exchange basis.
4. The company will be materially benefited by the resulting reduction of its dividend requirements.

Every holder of the 7 per cent cumulative preferred stock will have full opportunity to acquire the new $6 preferred stock, share for share, by exchange, with a substantial cash difference paid to the stockholder who elects to take advantage of the exchange offer.

Abandonment Sought in Fort Smith

Robert C. Coffy, vice-president and general manager of the Fort Smith Light & Traction Company, Fort Smith, Ark., has filed with the city commission a letter asking permission to abandon the company's railway system in Fort Smith and Van Buren on the ground that money is being lost in its operation, and that the company is unable to meet the expenses of paving between its tracks in the $275,000 street improvement program planned by the city.

The company will consider any suggestion the commission might make for relief in its present crisis. Action has been deferred by the City Commission for further consideration.

Increase in Net Income

Duluth-Superior Company reports increase in total operating revenues with falling off in expenses. Bus service not self-supporting

THE NET income of the Duluth-Superior Traction Company and subsidiary companies operating in Duluth, Minn., and Superior, Wis., was $107,645 for the year ended Dec. 31, 1927, compared with $60,796 for the year previous. This and other important results of the year's operation were contained in the annual report recently submitted to the stockholders, and shown in the accompanying statistical statements.

Progress has been made in settling paving claims which had been made by the city of Duluth during the past ten years. The city had brought suit for the sum of $68,306, being part of the cost of paving two streets in the business section of the city in which the company's tracks are constructed and operated. This suit was finally disposed of on July 15, 1927, by a decision of the Minnesota Supreme Court, affirming an order of the lower court awarding the city of Duluth the sum of $7,420. Since that decision other paving claims of the city of Duluth aggregating $36,113 against the company on account of paving have been settled by the payment of $701. This disposes of all the paving claims against the company by the city with the exception of $22,787.

On April 11, 1927, the United States Supreme Court handed down its decision affirming the decree of the United States District Court, District of Minnesota, upholding the company's

CONSOLIDATED INCOME STATEMENT OF THE DULUTH-SUPERIOR TRACTION COMPANY

	1927	1926
Operating revenues:		
Revenue from transportation	$1,948,393	$1,934,636
Revenue from other operations	17,095	16,506
Total operating revenues	$1,965,489	$1,951,142
Operating expenses:		
Way and structures	$191,529	$213,616
Equipment	194,023	235,637
Power	176,830	176,183
Conducting transportation	772,140	746,487
Traffic	2,263	1,526
General and miscellaneous	241,928	260,065
Transportation for investment-credit	—8,275	—11,384
Total operating expenses	$1,570,441	$1,622,131
Net revenue from operations	$395,047	$329,011
Taxes assignable to operations	$156,659	$133,974
Operating income	$238,388	$195,036
Non-operating income:		
Income from funded securities including interest on reacquired bonds issued by The Duluth Street Railway	$22,613	$22,284
Income from unfunded securities and accounts	2,043	2,425
Income from sinking fund and other reserves including interest on reacquired bonds issued by The Duluth Street Railway	14,035	14,091
Miscellaneous income	31	67
Total non-operating income	$38,723	$38,869
Gross income	$277,112	$233,906
Deductions from gross income:		
Interest on funded debt	$168,175	$169,664
Interest on unfunded debt	692	2,740
Miscellaneous debits	598	704
Total deductions from gross income	$169,466	$173,109
Net income transferred to profit and loss	$107,645	$60,796

CONSOLIDATED PROFIT AND LOSS AND SURPLUS ACCOUNT OF THE DULUTH-SUPERIOR TRACTION COMPANY

Corporate surplus as at Dec. 31, 1926		$642,540
Add:		
Net income for year ended Dec. 31, 1927		107,645
Miscellaneous credits:		
Discount on bonds purchased for sinking fund	$2,052	
Profit on investment securities sold	4,087	
Sundry items	609	6,749
		$756,935
Deduct:		
Dividends:		
Duluth-Superior Traction Company		
Preferred stock	$60,000	
Common stock	35,000	
Duluth Street Railway preferred stock	27,793	
	$122,793	
Miscellaneous debits:		
Claims paid-railroad crossing accident, superior	$40,832	
Sundry items	207	163,832
		$593,102
Corporate surplus, Dec. 31, 1927:		
Appropriated as follows:		
Additions to property through surplus	$171,470	
Funded debt retired through surplus	356,448	
Sinking fund reserve	16,098	
	$544,018	
Unappropriated	$49,084	$593,102

STATISTICAL STATEMENT OF THE DULUTH-SUPERIOR TRACTION COMPANY

Railway and Bus Operations

Total miles, all track reduced to single	112.62
Total miles of street and right-of-way occupied by tracks	61.76
Total miles of bus routes	28.77
Revenue from transportation, per mile single track including miles of bus routes	13,780
Revenue from transportation	$1,948,393

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right to go into the Federal Courts to protect the property with which it is vested from confiscation.

On July 11, 1927, application was made to the Railroad Commission of Wisconsin for an increased fare in the city of Superior. Hearing on this application was had before the commission on Sept. 26, 1927, and on Dec. 3, 1927, the Railroad Commission of Wisconsin filed its order fixing a rate of fare to be charged in the city of Superior of 8 cents cash, five tickets or tokens to be sold for 35 cents, this rate to become effective Jan. 1, 1928. This order fixes the same rate of fare in the city of Superior as in the city of Duluth.

The report reviews the history connected with the collision between a last passenger train of the Great Northern Railway and a car of the company in Superior on Jan. 6, 1927. This accident being unusual in the experience of the company, the amounts paid in settlement have been charged directly against the company's profit and loss account.

Depreciation has been accrued and charged monthly into operating expenses for the Duluth division in the amount fixed in the order of the Railroad & Warehouse Commission of Minnesota dated Oct. 4, 1926, and on the Superior, Wis., division, at the rate of 2.5 per cent upon an estimated undepreciated original cost of the depreciable property.

Automobile bus service, operated as a feeder to electric railway lines, while justified from a service standpoint, has not proved self-supporting. This service prevented greater loss from operation than would have resulted if street railway extensions had been constructed and operated.

No general mortgage bonds were authenticated or sold during the year but $26,000 par value of general mortgage bonds were retired under the sinking fund provision of the mortgage.

Western Pacific After Petaluma & Santa Rosa Railway

The Western Pacific Railroad filed with the Interstate Commerce Commission in Washington on Feb. 10 application for permission to purchase the Petaluma & Santa Rosa Railway. Some weeks ago the Southern Pacific and the Santa Fe, acting jointly, filed with the commission application for permit to purchase this line.

The Petaluma & Santa Rosa company operates a line between those two cities, the other principal city on the line being Sebastopol. The line has 48 miles of trackage, 38 being main line, and the company also operates two steamboats from Petaluma to San Francisco.

In its application the Western Pacific said it was prepared to pay $90 a share for the common stock, but said it had no contract for such purchase. The financial setup of the short line consists of a $750,000 bond issue, of which $590,000 is outstanding, $1,000,000 in common and $250,000 in preferred stock. Of the common there is outstanding $770,700 and of the preferred, $127,800. The common stock has a market value of $45.50, and the preferred $87.50.

Seattle Doing Better

Declaring that the "tide has turned in the affairs of the municipal street railway," Mayor Bertha K. Landes, of Seattle, Wash., further states that for the first time in nine years the city has owned the system "the future really looks hopeful." Mayor Landes declares that the people of Seattle have good reason to be gratified at the results obtained for the railway in 1927, and that the "railway is making substantial progress toward financial stability." Some facts which she quotes as encouraging follow:

	1926	1927
Operating revenue	$5,741,029	$5,703,873
Operating expense	5,015,887	4,765,845
Operating income	$725,142	$938,027
Miscellaneous revenue	18,179	26,598
Gross income	$743,321	$964,625
Interest	698,841	665,382
Net income	$44,480	$299,243

The net income of the railway for 1927 was $299,243, compared with $44,480, during 1926, due to economies put into effect during the year.

For several years the cash revenues have been decreasing, but the decrease in revenue for 1927-1926 was only one-seventh as great as for 1926-1925.

As the Mayor sees it the large jump ahead in net income will go a long way toward reducing the railway deficit of $694,153, and it is probable that when the years' accounts have been checked by the city comptroller, this deficit will have been reduced by nearly one-half.

Mayor Landes states that the improved financial condition of the railway has enabled the department to reconstruct the tracks in places where work had been deferred on account of lack of funds, and to introduce the 5-cent fare loop cars in the business district.

With her statement, Mayor Landes gave out the accompanying comparison.

Conspectus of Indexes for February, 1928

Compiled for Publication in This Paper by
ALBERT S. RICHEY
Electric Railway Engineer, Worcester, Mass.

	Latest	Month Ago	Year Ago	Since War High	Since War Low
Street Railway Fares* 1913 = 4.84	Feb. 1928 **7.59**	Jan. 1928 **7.59**	Feb. 1927 **7.45**	Feb. 1928 **7.59**	May 1923 **6.88**
Electric Railway Materials* 1913 = 100	Feb. 1928 **139.5**	Jan. 1928 **140.6**	Feb. 1927 **154.0**	Sept. 1920 **247.5**	Feb. 1928 **139.5**
Electric Railway Wages* 1913 = 100	Feb. 1928 **228.6**	Jan. 1928 **228.6**	Feb. 1927 **226.7**	Sept. 1920 **232**	March 1923 **206.8**
Am. Elec. Ry. Assn. Construction Cost (Elec. Ry.) 1913 = 100	Feb. 1928 **200.9**	Jan. 1928 **200.9**	Feb. 1927 **202.9**	July 1920 **256.4**	May 1922 **167.4**
Eng. News-Record Construction Cost (General) 1913 = 100	Feb. 1928 **204.6**	Jan. 1928 **203.9**	Feb. 1927 **210.2**	June 1920 **273.8**	March 1922 **162.0**
U. S. Bur. Lab. Stat. Wholesale Commodities† 1926 = 100	Jan. 1928 **96.3**	Dec. 1927 **96.8**	Jan. 1927 **96.6**		
Bradstreet Wholesale Commodities 1913 = 9.21	Feb. 1 1928 **13.53**	Jan. 1 1928 **13.57**	Feb. 1 1927 **12.52**	Feb. 1 1920 **20.87**	June 1 1921 **10.62**
U. S. Bur. Lab. Stat. Retail Food 1913 = 100	Jan. 1928 **155.1**	Dec. 1927 **155.9**	Jan. 1927 **159.3**	July 1920 **219.2**	March 1922 **138.7**
Nat. Ind. Conf. Bd. Cost of Living 1914 = 100	Jan. 1928 **163.1**	Dec. 1927 **163.6**	Jan. 1927 **166.9**	July 1920 **204.5**	Aug. 1922 **154.5**
Steel Unfilled Orders (Million Tons) 1913 = 5.91	Jan. 31 1928 **4.276**	Dec. 31 1927 **3.973**	Jan. 31 1927 **3.800**	July 31 1920 **11.118**	May 31 1927 **3.051**
Bank Clearings Outside N. Y. City (Billions)	Jan. 1928 **19.73**	Dec. 1927 **19.89**	Jan. 1927 **18.89**	Oct. 1925 **20.47**	Feb. 1921 **10.43**
Business Failures Number	Jan. 1928 2178	Dec. 1927 1820	Jan. 1927 2227	Jan. 1924 2231	Aug. 1925 1353
Liabilities (Millions)	**54.03**	**51.06**	**74.27**	**122.95**	**27.22**

*The three index numbers marked with an asterisk are computed by Mr. Richey, as follows: Fares index is average street railway fare in all United States cities with a population of 50,000 or over except New York City, and weighted according to population. Street Railway Materials index is relative average price of materials (including fuel) used in street railway operation and maintenance, weighted according to average use of such materials. Wages index is relative average maximum hourly wage of motormen, conductors and operators on 136 of the largest street and interurban railways operated in the United States, weighted according to the number of such men employed on these roads.

†This index is changed to a base of "1926 = 100." That notation replaces the former basis of "1913 = 100." Inasmuch as the bureau has not calculated the index on this new base any further back than January, 1923, no figures are shown in this tabulation for the high and low points since the war. It is planned to compute the index on the new basis as far back as January, 1913. Until such time as the bureau makes public these figures for the earlier years this information will be lacking.

Mortgage to Secure Advances Refused

In refusing to sanction a bond and motgage of $308,558 to be executed by the Phillipsburg Transit Company, Phillipsburg, N. J., to the Lehigh Valley Transit Company, Allentown, Pa., the Board of Public Utility Commissioners of New Jersey has announced there is no immediate likelihood of the Phillipsburg company earning even part of the interest which the bonds would bear.

The Phillipsburg Transit Company is owned by the Easton Transit Company, the stock of which is owned in turn by the Lehigh Valley Transit Company.

For some years the Phillipsburg company has been unable to meet all its pecuniary liabilities and has been partially dependent for operating and other expenses upon the Lehigh Valley Transit. The latter is still providing funds to continue operations, but asked for a mortgage to protect itself. The commission said it is not apparent that the creation of mortgage indebtedness would place the Lehigh Valley Transit in any better position than it now occupies.

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Revenue Increase on Washington Railway

The total amount of money credited to profit and loss during the year 1927 by the Washington Railway & Electric Company, Washington, D. C., was $760,019. This was disclosed in the annual report to the stockholders submitted at the annual meeting on Jan. 21. Earnings and expenses for the year ended Dec. 31, 1927, are shown in the accompanying table.

Aside from dividends from the Potomac Electric Power Company, included above, no income was received by the Washington Railway & Electric Company on its investment in stocks of subsidiary companies.

During the year the company's system carried 99,665,934 passengers, of whom 23,916,630 were carried on transfers, leaving 75,749,304 revenue passengers. In 1916 there were 76,797,163 revenue passengers, indicating a decrease in 1927 of 1,047,859. The report states that other cities within close proximity of Washington showed decreased patronage, that although traffic had been falling off almost constantly since 1920 it fell off to a considerably less degree in the past three years than formerly. Further, that appreciation of the street car as "the most economical means of transport with the highest relative value in handling mass transportation" and as "indispensable in urban communities" was growing throughout the country, with the result that consideration for the rapid and safe movement of street cars was being given in the formulation of traffic regulations.

Largely due to the enjoyment of a great increase in chartered bus service, and relatively more passengers paying their fare in cash than formerly, the loss in revenue through the decrease in revenue passengers carried was wholly overcome, with the result that operating revenues in 1927 increased $18,898. This, together with further economies in operation, brought about an increase of $78,601 in operating income.

The amount expended in 1927, for the proper upkeep of track and roadway, together with allowances for depreciation, was $866,191. The major projects covered the reconstruction during the year of 1.61 miles (8,510 feet) of underground conduit track, and 3.85 miles (20,306 feet) of overhead trolley track, at a total cost of $311,678.

The popularity of the fifteen modern cars, with automatic rear-exit doors and leather covered deluxe seats, purchased in June, 1926, reflected itself in a very satisfactory increase in revenue and convinced the company, so it claims, of the desirability of having similar equipment on the twelve new one-man cars ordered in 1927. These cars are to cost $175,000 and delivery is to be made in February, 1928. The company is also equipping 41 other one-man cars with automatic rear exit doors at a cost of $46,750.

In connection with its railway lines, the company is operating 70 buses, over routes having an aggregate mileage of 58.3 miles. Twenty of these buses were purchased in 1927 at a cost of $139,806, making the total investment now in buses $487,797. In the last report the company mentioned that since bus service was started in May, 1922, the expenses of operation had exceeded the receipts by $175,916, but that the results for 1926 offered more encouragement. This opinion had been borne out by the results for 1927, which showed the receipts approximately $2,400 in excess of operating costs.

The safety contest opened in February, 1921, is still being carried on. There was a reduction of more than 7 per cent in the number of accidents in 1927 compared with 1926, and a reduction in the amount paid in the settlement of damage claims and suits of $30,676. Efforts of the company in drawing the attention of its employees to the need of care in all street movements, and the high degree of operating efficiency in which the equipment has been maintained have all aided in bringing about this splendid showing. Greater efficiency in operation, together with improved condition of the equipment and track, has also brought about a dcerease in interruptions to service. The number of detentions decreased 17 per cent and the time lost in detensions decreased 30 per cent.

On the subject of the District of Columbia merger President Ham said that conferences were in progress and it was hoped that some plan fair alike to the public and the holders of the securities of the companies involved might be devised.

The outstanding bonded debt of the Washington Railway & Electric Company and subsidiary companies, including the Potomac Electric Power Company, is now $24,120,700. Adding this to the $15,000,000 capital stock of the parent company, and $7,002,850 outstanding capital stock of subsidiary companies, makes the total outstanding capitalization as of Dec. 31, 1927, $46,123,550. This excludes bonds purchased for the sinking fund and for temporary investment.

For the year 1927 the total payroll of the Washington Railway & Electric Company and subsidiary companies, including the Potomac Electric Power Company, was $4,960,298, an increase of $166,157 over that of the previous year. The number of employees in the service of the company's system is now 2,976, of which 2,139 are members of the Washington Railway Relief Association. This organization, in conjunction with the company, has continued the group life insurance of its members. This plan has now been in effect almost seven years, and during the period 67 payments, aggregating $81,911, have been made to beneficiaries. The relief association expended $12,433 in sick benefits to its members, and, together with the Washington Railway & Electric Company, is now paying pensions to its members aggregating $38,140 annually.

The number of stockholders at the close of 1927 was 2,021 of whom 1,159 were women, trustees, charitable, beneficial, religious and other similar organizations.

CONDENSED STATEMENT OF THE WASHINGTON RAILWAY & ELECTRIC COMPANY FOR YEAR 1927

Gross earnings from operation	$5,865,429	
Miscellaneous income (including dividends from Potomac Electric Power Company)	1,300,682	
Gross income		$7,166,112
Operating expenses (including depreciation), taxes and miscellaneous charges	4,846,618	
Interest on funded and unfunded debt	746,429	
Payment of dividends on preferred stock	425,000	
Payment of dividends on common stock	390,000	
		6,408,047
Balance of income for year 1927 credited to profit and loss		758,064
Miscellaneous items credited to profit and loss		1,954
Total credited to profit and loss during the year		$760,019

Some Recent Results in Toledo

Street Railway Commissioner Graumlich at Toledo, Ohio, reported that the first week in March would see sufficient money in the sinking fund to retire bonds up to 20 per cent of the total capital value of the Toledo Traction Company and, therefore, after that time the sinking fund would cease to operate. The company has a total capital value of $9,096,940 of which $1,820,000 will be retired early in March.

This will throw about $27,000 a month into the picture and with other economies will soon be reflected in surplus credits to the stabilizing fund in which there is an accumulated deficit of $1,272,369, in addition to the $400,000 originally set up.

Bus operations has begun to show a profit under the plant of awarding as revenue to the feeder lines all of the revenue collected from passengers and half that collected on cars from passengers turned over to the feeders. Under this accounting plan the gross profit from coach operation for January in Toledo was $3,450.

Abandonment of Fulton Line Allowed

Abandonment of the Fulton, N. Y., city line of the Empire State Railroad Corporation was approved by order of the Public Service Commission recently. Evidence before Commissioner Brewster showed that the line paid until bus operations were established in the same territory. Without considering taxes or interest charges, there was a deficit in 1926 of $1,239, and for the first six months of 1927, $1,127.

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Personal Items

D. J. Torrance Promoted in Seattle

D. J. Torrance, assistant comptroller in the Seattle offices of the Stone & Webster Corporation, a position he has held since 1925, has been named secretary-assistant to A. W. Leonard, president of the Puget Sound Power & Light Company. Mr. Torrance has had wide experience in public utility operation and in finance to qualify him for the range of his new duties.

A native of Georgia, he was early identified with the Key West Electric Company and the El Paso Electric Company. Later, he went to Peking, China, for seven years where he served as Chinese representative of the American International Corporation. He is a life member of the Peking Club, was president of the American Association in Peking and for many years has been an associate member of the American Institute of Electrical Engineers. When conditions became chaotic in China, Mr. Torrance returned to the United States and for one year was in the Boston offices of the Stone & Webster Corporation.

W. H. Taylor Heads Philadelphia Electric

William H. Taylor, vice-president in charge of operations and maintenance of the United Gas Improvement Company, was recently elected president of the Philadelphia Electric Company. Immediately after the announcement of his election to the presidency, Mr. Taylor, who has had twenty-five years' experience in the public utility industry, said he had resigned as vice-president of the United Gas Improvement Company.

Mr. Taylor, well known in utility circles as an expert in appraisal and rate matters and in general consulting engineering work, and a former vice-president and general manager of the Georgia Railway & Power Company, Atlanta, was elected vice-president of the United Gas Improvement Company early in 1927. He began his career in 1903 as a constructor with the United Gas Improvement forces. Mr. Taylor was graduated from the Stevens Institute of Technology.

F. I. Hardy Leaves Boston & Maine

F. I. Hardy, assistant to the president of the Boston & Maine Railroad, has resigned to become president of the Woodbury Granite Company of Vermont, with headquarters at Burlington. Mr. Hardy had charge of the Boston & Maine's motor trucking activities.

The electric railway business had claimed many years of his career. Prior to his affiliation with the Boston & Maine in 1924 he served as manager of the Chelsea District of the Eastern Massachusetts Street Railway. In the past he was identified with the Union Traction Company of Indiana, the Fort Wayne & Northern Indiana Traction Company, the Chicago, South Bend & Northern Indiana Railway, the Southern Michigan Railway and the Northern Ohio Traction & Light Company of Akron, now known as the Northern Ohio Power & Light Company.

C. R. Bendell General Manager at Wheeling

C. R. Bendell was recently appointed general manager of the Wheeling Public Service Company, Wheeling, W. Va.

C. R. Bendell

He has been connected with this property, which operates railway, bus and power service, for several years in the capacity of dispatcher, division superintendent, head of the claim department and maintenance of way and equipment. Later he became general superintendent. With keen powers of observation and a long and valuable experience in Wheeling he is prepared to take over the managerial duties incident to his recent promotion. The territory in which the company of which Mr. Bendell is a part operates has, particularly since the war-time period experienced phenomenal growth.

Mr. Bendell was born in Martins Ferry, Ohio. He received his early education in the public schools of that state. At an early age he went to Wheeling and entered the utilities field in a minor position.

Changes in Louisville

At the general meeting following the stockholders meeting of the Louisville Railway, Louisville, Ky., on Feb. 15, the following changes were made in the operating staff.

Samuel Riddle, was elected secretary and now carries the title of vice-president and secretary.

E. F. Kelley was appointed assistant secretary and assistant treasurer, in addition to his duties as purchasing agent and private secretary to President J. P. Barnes.

Mrs. Anna L. Humphrey was appointed treasurer. In June, 1927, following the death of Samuel G. Boyle, for many years secretary and treasurer of the Louisville Railway, Mrs. Humphrey took over the duties of the treasury department as assistant treasurer.

Mrs. Humphrey was connected with the auditing department of the United Traction Company, Albany, N. Y., from 1918 until 1922. In 1922 she was located in Louisville, Kentucky, as auditor of the Inland Waterways Company. This company operated a line of steamboats and barges on the Ohio and Kentucky Rivers, between Pittsburgh, Beattyville and St. Louis. On Jan. 1, 1926, she became auditor of the Louisville Community Chest, which represented forty-three social and charitable agencies in the city of Louisville.

J. H. Ward at Port Arthur

J. H. Ward was recently made assistant superintendent of transportation, Eastern Texas Electric Company, Port Arthur Division, Port Arthur, Tex. He entered the service of this company at Beaumont in 1917. Two years later he was appointed supervisor and in 1927 he assumed charge of the Beaumont-Port Arthur Bus Line route. On Jan. 21 of this year, he was transferred to Port Arthur. His excellent record while in Beaumont resulted in his being selected to the post at Port Arthur upon the purchase of the Port Arthur Traction Company's physical properties by the Eastern Texas Electric Company. This purchase became effective on Jan. 22.

Obituary

Richard A. Berry

Richard A. Berry, assistant engineer of the Board of Transportation, New York, N. Y., died on Feb. 18. He was engaged in engineering and construction since 1899. Mr. Berry's service as assistant engineer with the Public Service Commission, the Transit Commission and the City Board of Transportation was mainly on the construction of the subway stations in the Bronx. His latest work in that field was the construction of the enclosed passenger transfer connection between the elevated lines and the subway lines at 149th Street and Third Avenue.

Mr. Berry attended Fordham University and Manhattan College and was graduated with the degree of bachelor of science and civil engineer.

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Manufactures *and the* Markets

Use of Simplified Invoice Form Steadily Increasing

By Ray M. Hudson,

Assistant Director Commercial Standards, Bureau of Standards, Dept. of Commerce, Washington, D. C.

With the view to reducing avoidable waste in office operations, several nationally known trade associations and business organizations co-operated in producing the simplified invoice form which was brought out a year ago. The group includes the National Association of Purchasing Agents, Railway Accounting Officers' Association, National Association of Cost Accountants, Controllers' Congress of National Retail Dry Goods Association, also several prominent manufacturers. The Division of Simplified Practice of the United States Department of Commerce, in response to the request of the above-interested parties, acted as a co-ordinator for the group and is now assisting it in promoting the application and use of the form.

To date, the simplified invoice has been accepted by 27 well-known trade associations. Countless prominent firms and corporations have accepted this form as their standard. Others say they will do so when stocks of their present individual forms run out. The experience of several firms is that each day's mail brings in a few more invoices on the simplified form.

As might be expected with a project of this kind, some companies find a problem in substituting the simplified invoice form for the invoice form they are now using. This problem naturally divides into two phases—one dealing with outbound invoices, the other with inbound.

Consider the outbound invoice. The company rendering the bill naturally prefers to do its billing on one form, and preferably one which will not only meet its own needs in the circumstances, but will also be acceptable to the recipients. When the issuing company is requested to use the purchaser's supplied form, there arises the problem of training billing clerks to put the data on each individual form, a consequent slowing down of the clerk's output, possible delay due to running out of stock of a customer's form, also risk of return of invoice by the recipient because the information is incorrectly placed on his special form. Add to this the yards of correspondence, hours of dictation and stenographic effort, the reams of paper, the dollars of postage, and all the other costs necessary to clear up misunderstandings, and the probabilities are that the cost-to-issue per invoice soon reach an amount out of proportion to the real value of this kind of customer-accommodation.

There is also the question as to whether the issuing company is in duty bound or under any special obligation to render such peculiar and special service to a customer. Billing on customer's forms is usually done as a matter of good will, or courtesy. Obviously the customer buys the goods for their ability to meet his requirements, and not because of the vendor's willingness to render his bills on the customer's forms. Imposition on vendors of costs which normally belong to the customer means those costs usually find their way back to the customer in the price he pays for the goods he buys.

Consider the inbound invoice. Under former conditions, a company buying from 100 vendors was likely to receive nearly 100 different invoice forms, each varying from the other in size, spacing, arrangement of material on the face of the form, etc. Undoubtedly, the desire to get away from the troubles resulting from too many different forms prompted many purchasing agents to request their vendors to submit their bills on the form furnished by the purchaser. It would seem both possible and practicable in many instances to pass the simplified invoice through exactly the same routine through which the purchaser's present form passes. Through the use of the simplified form, the customer is freed from the bother and worry, also the expense of keeping his vendors properly stocked, with his own company's forms.

Exhibitograph No. 3

CHEERIO!

Why has the Manufacturer Membership in the A.E.R.A. grown from

244 in 1922 to 445 in 1928?

Because A.E.R.A. members secure value received for their money. Think it over, but don't forget to plan early for your Cleveland Exhibit.

Sept. 22-28

Lightweight Cars for Knoxville

Plans for the twelve city-type passenger cars which were ordered by the Knoxville Power & Light Company, Knoxville, Tenn., have been released. Mention of the order was made in this paper, issue of Nov. 5. The cars will be of the one-man, double-truck type for single-end operation. They will be of semi-steel design and will have an over-all length of 43 ft. 9 in. The total weight will be 30,000 lb. and the cars will seat 54 passengers.

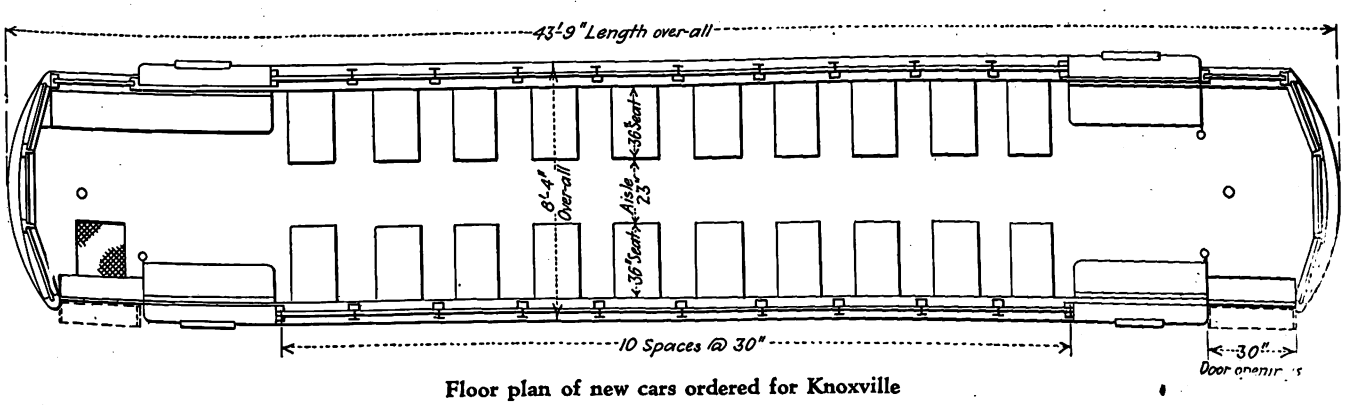
The principal dimensions of the cars are given herewith, along with a floor plan. Complete specifications were published in the issue of Dec. 10.

GENERAL DIMENSIONS

Length over dashers	42 ft. 2 in.
Length over body	33 ft. 6 in.
Length of platform	4 ft. 4 in.
Rail to top of trolley board	10 ft. 5 11/16 in.
Rail to bottom side sill	28 5/8 in.
Rail to first step	15 in.
First to second step	10 in.
Second step to platform	8 in.
Extreme width	8 ft. 4 in.
Bumper extensions	6 in.
Post centers	30 in.
Clear height inside	7 ft. 3 in.
Width of seats	36 in.
Width of aisle	23 in.
Door openings clear	30 in.
Truck centers (approximately)	24 ft. 0 in.
Wheelbase	5 ft. 0 in.
Size of wheel	26 in.

GENERAL INFORMATION

Seating capacity	54
Interior finish	cherry
Type bolster	Box Girder



Floor plan of new cars ordered for Knoxville

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Purchasing agents willing to test the simplified invoice will find many vendors ready to render their bills on that form. All the purchaser has to do is to request the vendor to "Render all bills on the simplified invoice form."

Not long ago 35 business corporations of average size were asked to estimate what, in the opinion of their officers, might be saved in their purchasing and accounting departments if all invoices received by them were on a national standard invoice form. If these corporations estimated correctly, the annual saving of 25,000 concerns of corresponding size in the United States, Canada and Mexico would amount to $15,500,000. If we discount this figure for the purpose of being conservative, the potential savings would still run into the millions of dollars.

The Department of Commerce, through its Division of Simplified Practice, heartily commends the Simplified Invoice to all vendors and purchasers for their careful consideration, believing a fair and adequate trial of this form will quickly demonstrate its merits and values.

[An article describing the simplified invoice, together with a reproduction of the standard form, appeared in this paper for April 23, 1927, page 760.—EDITOR.]

Attractive Book Issued by Hyatt Roller Bearing

Hyatt Roller Bearing Company, a division of General Motors, Newark, N. J., has published an attractive book with illustrations entitled "Hyatt Equipped Railroad Journal Boxes." The cover design is tan with a darker shade of brown, with an illustration in the center which depicts a locomotive with a mountain in the background. The book contains 44 pages; is replete with illustrations brown over tint and thoroughly takes up the use and advantages of the company's roller bearings.

Among the subjects in the table of contents are: "Hyatt Roller Bearing Railroad Type," "Actual Performance," "The Economic Phase," "Comparative Starting Torque," "Safety and Reliability," and "In Interurban and Street Railway Service." The style of the book is clear and concise with the essentials of the subject kept in the foreground. It contains a picture of the inventor, John Wesley Hyatt, and also of the company's plant at Harrison, N. J., adjacent to Newark.

Banquet Marks Closing of Carhouse

The Gates-lane carhouse of the Worcester Consolidated Street Railway has been closed and the cars have been transferred to the new house and yards on Grove Street. Men employed at the carhouse for years had a banquet to mark its passing. The closing of the Gates-lane carhouse has resulted in centralizing the equipment of the company and has created the necessity of rearranging runs. The Consolidated has recently constructed a bus garage and modern carhouse on the Grove Street property which for many years was used as a storage yard. It is planned to make "running repairs" at the new carhouse while the Market Street carhouse, which is now the only other one of the trolley company in use, will be used for the major repairs.

METAL, COAL AND MATERIAL PRICES
F. O. B. REFINERY

Metals—New York	Feb. 21, 1928
Copper, electrolytic, cents per lb.	13.775
Copper wire, cents per lb.	16.125
Lead, cents per lb.	6.225
Zinc, cents per lb.	5.80
Tin, Straits, cents per lb.	51.375
Bituminous Coal, f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons.	.....
Somerset mine run, Boston, net tons.	.....
Pittsburgh mine run, Pittsburgh, net tons.	.....
Franklin, Ill., screenings, Chicago, net tons	1.825
Central, Ill., screenings, Chicago, net tons.	1.575
Kansas screenings, Kansas City, net tons.	2.125
Materials	
Rubber-covered wire, N. Y., No. 14, per 1,000 ft.	5.30
Weatherproof wire base, N.Y., cents per lb.	16.50
Cement, Chicago net prices, without bags	2.05
Linseed oil (5-bbl. lots), N. Y., cents per lb.	10.2
White lead in oil (100-lb. keg), N. Y., cents per lb.	13.25
Turpentine (bbl. lots), N. Y., per gal.	$0.6475

Cincinnati Car Pleased at Prospects Ahead

For the first time since the reorganization of the Cincinnati Car Company on Oct. 1, 1926, stockholders of the company met recently and received the report of the officers as to operations in the last quarter of 1926 and the full twelve months of 1927.

President Sanders referred to 1927 as "a lean year in which the dividends requirements of $328,805 were earned and also a small amount carried to surplus."

The condensed statement of income and surplus for 1927, showed current assets of $1,542,176 and current liabilities of $209,191. The gross income for that period was $2,040,802, the net income $343,748, dividend disbursements $328,805 and the sum of $14,943 carried to surplus.

The company now has orders in sight for 119 cars as against 68 cars built last year. Mr. Sanders said:

Today it is the almost unanimous belief of railway operators, and I might say city officials also, that, while the bus can be used to advantage in many places, it cannot supplant the rail car in handling mass transportation.

Operators generally are, however, convinced that there is an increasing demand for speedier and more comfortable city and interurban cars, and those with foresight, such as we see in Cincinnati, are meeting the demand by re-entering the market for new and improved cars.

A very large majority of the population of our cities rides in street cars because they are safer, more comfortable and cheaper than other public carriers, and yet this vast majority has been unwittingly discriminated against by municipal authorities in favor of the private automobile owner who not only uses more than his share of the streets when traveling, but uses them for storage purposes as well, and thus selfishly impedes all street traffic.

Redecorated Cars Scheduled to Go Into Service Feb. 19

Refurbished and wholly redecorated street cars were scheduled to be placed on the Northeast-Woodland street car line of the Kansas City Public Service Company, Kansas City, Mo., on Feb. 19, according to a recent report. The shops are turning out two rebuilt cars a day. The entire overhauling of the existing equipment will be finished by July 1, it is estimated.

40 Electric Locomotives for Paris-Orleans Railroad

Oerlikon-Batignolles Company has recently supplied 40 electric locomotives to the Paris-Orleans Railroad. Both passenger and freight locomotives are represented in this order.

ROLLING STOCK

BOSTON ELEVATED RAILWAY, Boston, Mass., has accepted delivery on one 29-passenger Mack four-cylinder, city type bus.

EASTERN MASSACHUSETTS STREET RAILWAY, Boston, Mass., has recently ordered a Fageol (A.C.F.) urban coach.

SHOPS AND BUILDINGS

GENERAL TIRE & RUBBER COMPANY, Akron, Ohio, has announced that it has just completed purchase of ground, and has started plans for a modern office and warehouse building at Kansas City, Mo., and that the cost of the site and building will be about $200,000.

TRADE NOTES

LINCOLN ELECTRIC COMPANY, Cleveland, Ohio, has appointed O. D. Fries as salesman in charge of consumer motor business in the Detroit territory under the direction of J. M. Robinson, district manager. Mr. Fries was educated in the Glasgow Royal Technical College and the University of Glasgow, Scotland. Since he was graduated he has had much experience in practical and theoretical enginering as well as a wide sales experience.

ADVERTISING LITERATURE

TORCHWELD EQUIPMENT COMPANY, Chicago, Ill., has issued a new Catalog No. 28 descriptive of its welding and cutting equipment. The pamphlet is entitled "Standard of Comparison."

ENGBERG'S ELECTRIC & MECHANICAL WORKS, St. Joseph, Mich., has recently issued new bulletins Nos. 6023 and 6025 descriptive of its direct-current motors and motor generators.

FUSION WELDING CORPORATION, Chicago, Ill., has issued a descriptive bulletin on its "Fuzon arc welders."

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"The Car for 1928"

IN designing the Brill 1928 Model Electric Car, it was the aim of Brill Engineers to provide attractive appearance, greater riding comfort and more efficient operation.

Brake and acceleration tests proved beyond doubt that "The Car for 1928" could not only improve schedule speed but operate economically and with much less noise.

It was believed that the attractive appearance and comfortable riding qualities would favorably impress the public. This belief was given substantiation by the thousands of comments received. Space permits the quotation of only a few of these comments. "A new era in electric car comfort," "The new Brill Car is one of the greatest achievements made by any electric car builder. It is a step toward better transportation," "The comfort afforded by the Brill 1928 Model Car is most gratifying."

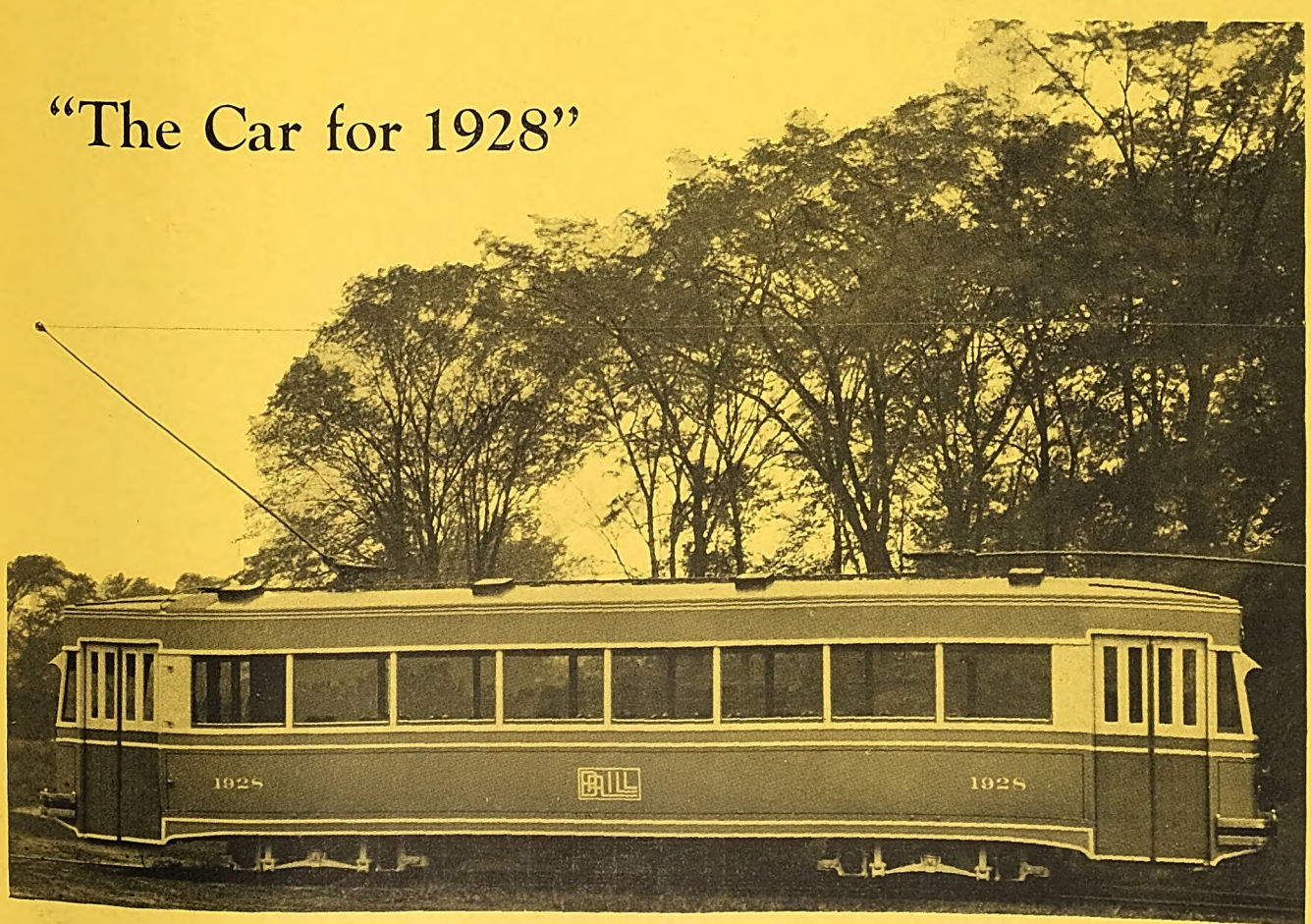
Write for specification details and interesting test reports.

The J. G. Brill Company
Philadelphia

American Car Company
St. Louis

The G. C. Kuhlman Car Co.
Cleveland

Wason Mfg. Company
Springfield, Mass.



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G-E Hinged-type Finger

Modernizing Controllers on the B.M.T.

In its program of modernization, the Brooklyn Manhattan Transit Corporation chose G-E quality parts, including 16,100 hinged-type fingers. This new finger becomes an integral part of the controller and, since it is equipped with a removable tip, will not normally require replacement. It is self-aligning; hence it gives full-width contact under all operating conditions. It will not break or bend in the most severe service.

You, too, can minimize your maintenance costs by replacing worn-out and obsolete fingers with the new G-E self-aligning finger.

General Electric renewal parts are designed and built especially for G-E equipment. Safeguard this equipment by using the Renewal Parts Catalog which General Electric has compiled for you individually.

330-66

GENERAL ELECTRIC

GENERAL ELECTRIC COMPANY, SCHENECTADY, N. Y., SALES OFFICES IN PRINCIPAL CITIES

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ELECTRIC RAILWAY JOURNAL

McGraw-Hill Publishing Company, Inc. MARCH 3, 1928 Twenty Cents per Copy

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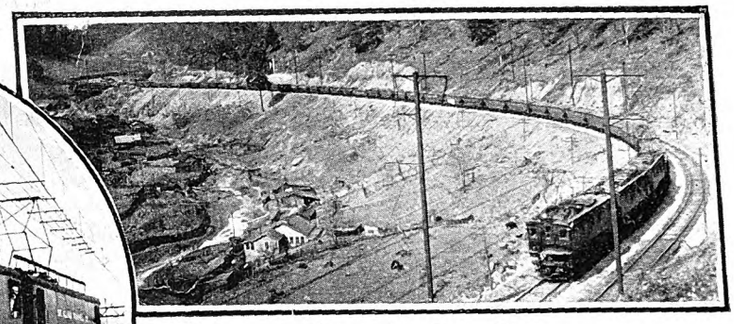
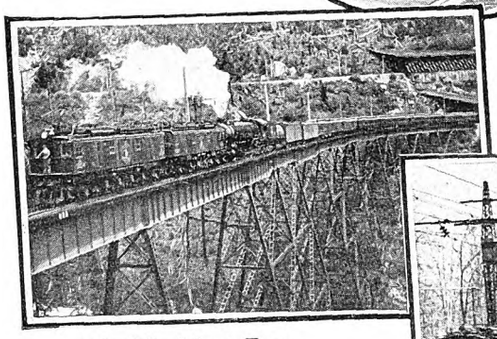
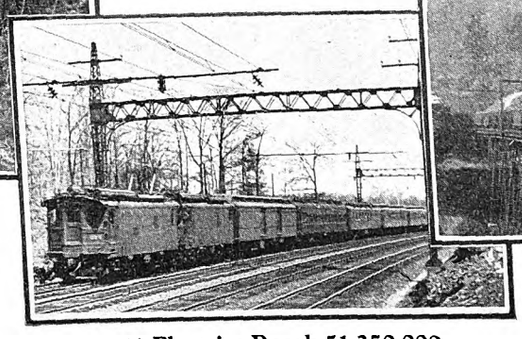


Operating Costs Reduced 45% on the Virginian Railway

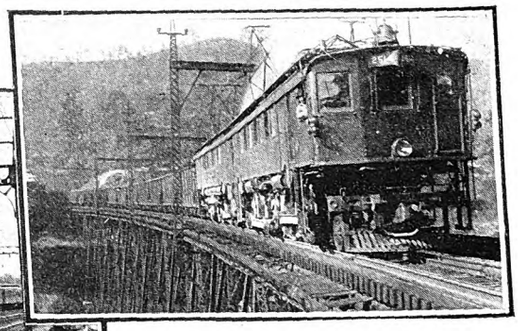
Nineteen Years and not an hour's delay on the Canadian National-Grand Trunk Railways where six 67½ ton Baldwin-Westinghouse locomotives are employed for service in the St. Clair Tunnel.



World's Most Powerful Motor-Generator Locomotive Operating on the Great Northern



41 Electrics Reach 51,250,000 Mileage on the New Haven in 20 Years



Twelve Electric Replace 50 Steam Locomotives on the Norfolk & Western

THROUGH electrification of railroads, Westinghouse has made many noteworthy contributions toward the solution of transportation problems. These include the electrification of terminals, yards, and the main and suburban lines of the leading transportation systems in the United States and also those of foreign countries.

Following are a few of the railroads in the United States served by Westinghouse:

- The Pennsylvania Railroad
- The New York, New Haven & Hartford Railroad
- The Long Island Railroad
- The C. M. & St. Paul Railway
- The Erie Railroad
- The Great Northern Railway
- The Virginian Railway
- The Canadian National-Grand-Trunk Railways
- The New York, Westchester & Boston Railway
- The Boston & Maine Railroad
- The Illinois Central
- The Southern Pacific Railroad

MEMBER AMERICAN ELECTRIC RAILWAY ASSOCIATION AERA 1928

Westinghouse Electric & Manufacturing Company
East Pittsburgh Pennsylvania
Sales Offices in All Principal Cities of the United States and Foreign Countries

Westinghouse

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Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review
Published by McGraw-Hill Publishing Company, Inc.
CHARLES GORDON, *Editor*

Volume 71 New York, Saturday, March 3, 1928 *Number 9*

Financial Structure of Buffalo Company Strengthened

STOCKHOLDERS of the International Railway, Buffalo, have approved a plan for strengthening the financial structure of the company, thereby improving its credit and increasing its ability to render steadily improving service. The plan provides for immediate amortization of intangible capital which the Public Service Commission has suggested be amortized over a period of years, for the writing off of strike suspense, for the issuing of no par value common stock in exchange for present common stock of $100 par value and for the issuing of $2,000,000 of preferred stock. The present plan is to make the preferred issue available first to present stockholders in proportion to their holdings.

This action might be dismissed with no other comment than that it is merely another move in the upbuilding of the system, but it really is much more important than that. No end of hard work has been done by the management in Buffalo, and it would appear now that the company there is again coming into its own. The city is saturated with autos even to a greater extent than other cities of similar size, and in addition to that there have been elements of political antagonism to contend with that were largely heritages from past régimes. Some of that ground has been gone over before in ELECTRIC RAILWAY JOURNAL.

The conditions at Buffalo which make desirable the financial changes now proposed had their beginning in 1912, when the railway mortgaged its property. At that time the Public Service Commission directed that the company set up on its books an item of $12,651,500 as intangible capital to be amortized over a period of years. Of this amount approximately $4,000,000 has been written off. The company is now carrying on the asset side of its balance sheet an item of roughly $6,000,000 strike suspense. It was intended that this should be written off over a period of years, but the present plan will permit the amount to be written off immediately. The substitution of no par value stock for $100 par value stock and the resulting changes in the company's balance sheet have been approved by the Public Service Commission. Sanction for the proposed issue of preferred stock will now be sought from the commission. Proceeds from the sale of this preferred stock will be used for the substitution of permanent financing for temporary financing of necessary capital expenditures and for future similar requirements.

For the benefit of the stockholders of the company and for the information of the public the company explains that changing the common stock from $100 par value to no par value has no effect upon the value of the stock, or upon its earning power. There will be exactly the same number of shares, and each certificate will represent the same share of ownership. It is an interesting move, one that the entire industry may well ponder, particularly since the change would seem to presage early future financing with preferred stock, in which it is reasonable to expect both the employees of the company and the public as well will be permitted to participate.

Lessons Taught by the Pittsburgh Traffic Report

DISCLOSURE in the recent traffic study in Pittsburgh that the number of vehicles entering the business district each day has more than doubled during the past ten years, shows a situation that could probably be paralleled in many other large cities of the country. A second fact found in this same survey, that in spite of this influx of buses, taxicabs and private automobiles, the street cars still carry the vast majority of the city workers to their places of business, will also find a counterpart in other metropolitan areas. Hence, if there is a solution of the Pittsburgh problem, it ought to help elsewhere.

The Pittsburgh City Transit Commission thinks that the answer is to put the trolley cars within the business district in a subway which later could be used for high speed trains when rapid transit extensions can be built in the outlying portions of the city. This will relieve the congestion in the downtown area by permitting all of the street surface to be used by free-moving vehicles only, according to the commission. The higher speed of the cars possible underground will attract more passengers to them and thus help still further to relieve the surface congestion.

In cities large and wealthy enough to afford underground highways, the plan is an excellent one, provided the cost of the improvement is not assessed entirely or largely on the car riders. They are only one group among many to whom the increase in street space thus made possible is of benefit. Nor should the transportation company be made to bear the cost. It is quite as apt to suffer as to benefit by the change. Its cars will make better time, it is true, and the company will gain in the number of passengers which it will carry. But these passengers will be in the long-distance class, and the pick-up business of short-haul passengers will probably be much less. Experience has shown that the short-distance rider does not like to climb up and down steps. It must also not be forgotten that removal of the tracks from the surface will decrease the means for riding within the business district. Those who are accustomed to patronizing the street cars for this purpose will have to adopt a more expensive way for getting about or else walk.

Of course, there are many cities in the country with serious street congestion where such a solution is impracticable. A subway is a luxury which only a few communities can afford. The smaller cities must continue to operate cars and automobiles on the same street level.

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There, the aim should be to secure the maximum useful width of street in the congested sections by reducing or eliminating parking, then to co-ordinate the traffic flow by shortening the waiting time of vehicles at crossings and increase the speed of movement, particularly of the street cars. Until the average car speed equals that of the free-moving motor vehicle on the same street, street railway operation will be under a handicap.

Columbia Reaps the Consequences

COLUMBIA, S. C., is the scene of a transportation travesty with a record number of performances which is becoming a bore to spectators and something of a blight on the accomplishments of that section of the South. Reports emanating from that territory state that the citizens are more and more aroused over the lack of a responsible transport service and are going to force the issue in the April election of City Council members. But making the transportation tangle the main issue in the election will not undo the bungling and befogging of the issues involved for which honors are evenly divided among the people and the authorities. Constructive thinking, deft handling, conciliatory methods and active authority are the new characters that must enter quickly to produce a happy ending in Columbia.

Glossing over the facts will not mitigate the conditions aggravated since Jan. 1 of this year when the citizens were left to the mercy of unregulated jitneys for their means of transportation. Almost a year has transpired since the Columbia Railway, Gas & Electric Company, unable to justify necessary expenditures to physical property, abandoned service on its railway system of 32 miles. A glance at the traffic records since 1923 is convincing proof of the inability of the company to continue to supply this service. In that year 3,270,321 passengers were carried. Since then there has been a consistent decline—1924, 2,948,928; 1925, 2,290,734 and in 1926, 1,613,891. The loss of patronage forced the company to abandon service on March 11, leaving approximately 50,000 people to be transported by the systems which had contributed to its downfall, namely, the Carolina Transit Company and the 10-cent haphazard jitneys.

Events since that time have been covered in the news section of this paper. Suffice it to say now that the past fourteen months have been prolific of multifarious moves toward restoration of railway service, counter moves for bus operation, bills to eliminate the jitney, threats to intimidate the railway, an impasse, commission opinions, another impasse, federal stay, public demands and so on ad absurdum.

Whatever conclusions might be drawn on the rights of one utility agency against another, it would appear that co-operation and conciliation could certainly have done no worse than condemnation and conflict, and considered in the light of experience in other cities, they might have helped toward a solution. Three separate and distinct agencies serving approximately 50,000 people were competing for a failure, and that failure appears to have fallen on all three. Now if the people want the railway service restored—and many indications point that way—then that system should be so supported that it will be a paying enterprise responsible to a thinking and just authority and reliable to a co-operative and fair-dealing public. If public opinion prefers another system of transport, then such a system should be installed and should meet the same conditions as would prevail with a railway.

These unsavory details in the story of a public service represent the ultimate result of destructive public policy founded on much opinion, little knowledge and the lack of a spirit of fair play. One can hardly refrain from expressing the opinion that Columbia is in a measure reaping as it sowed. The transportation comedy there has its tragic aspects—tragic indeed to those who invested their money in good faith. It is to be hoped that the story may be broadcast to other cities that are inclined to think that they can manhandle and starve facilities and have them continue to perform. As for Columbia, it is high time for it to draw the curtain on the scene and put on a new act with sufficient promise to induce forgetfulness of past performances.

Accountants Should Not Be Historians Only

GROWING interest in accounting is shown by the work of the Central Electric Railway Accountants' Association at its recent meeting. Problems that deal with the progress of the electric roads in the territory were discussed at length and plans were made for furthering the interchange of freight, handling of records and other details that are essential if these railways are to increase their business. Along the same line, President Healy in his inaugural address showed how the accountants have been an influence for many years in the affairs of their companies.

A progressive viewpoint such as this is essential if the accountant is to be the power for good that he can be. He is in a position where he is able to wield an immense influence over his company. While the keeping of records of what has happened already is fairly simple, it is the interpretation of what is likely to happen, as disclosed by the figures, which is of far greater value. This is a task of no mean importance. Budgeting is being resorted to more and more, both with regard to expenditures and on some properties with regard to revenues. Naturally if a program for expenditures is to be figured out for a year or any longer period it is essential that some attention be paid to the collection of revenue that will make the program possible. In both of these phases the accountant must exercise the best of judgment if the estimates are to be of maximum value.

Another class of accounting, which perhaps has not been given equal attention, is the determination of costs for different types of construction or equipment. For instance, carefully kept records over an extended period almost invariably will indicate which type of car, of motor or of track is the most economical. Operating costs should indicate whether it is an economy to continue the use of an obsolete car, an old substation or an antiquated stretch of track as compared with the cost of new. Similar comparisons can be made regarding any detail of the operation. Occasionally the individual departments have made the attempt to keep such figures, often without result. The accounting department, however, is the place where information of this sort can be compiled most accurately and most cheaply. Naturally, conferences with the other departments involved are necessary if intelligent statistics are to be collected. It is the exercise of such intelligence that makes the accountant a real power in his company rather than a mere bookkeeper. Meetings of accountants that look forward to this end are well worth while.

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The Turk Turns on the Onion Eater

CIVILIZATION as the West knows it has had unexpected results in its application to the Turks. The fez is going or has gone, the harem as an institution has passed, trousers have come in for use by the ruler's wife and his inamorata or inamoratas and the veiled woman meanders only through the pages of history and the stories of oriental romance. In Turkey modernism has gone mad. Witness the reported order issued recently to street car conductors of Constantinople to eject from the trams passengers who have been eating onions. In other words, conductors there must really know their onions. So it will be the rule that the men who man cars there must choose between the onion eater and the lotus eater. There must be nothing the matter with their olfactory organs lest an inspector passing through the car detect an odor where they have sensed none.

Here is a parallel out of the East to the beautiful girl in the newspaper ad who grows reticent because the man with millions or erudition that she should adore is a victim of halitosis. In that respect she has nothing on the Constantinople conductor who should now apparently recommend the use of some deodorant. Since onions are a national dish of the Turks the idea of legislating against the weeping weed might have terrible effects should others adopt a similar policy. Suppose Dublin conductors had to put passengers off who were suspected of eating Irish stew, Viennese trainmen to eject those suspected of eating Hungarian goulash, Berliners those of eating Limburger cheese, Glasgowans those of eating Scotch scones, and New Yorkers those of eating gefilltefish or known to have gulped garlic.

Here is an idea for the segregation of passengers along gastronomic lines. Enforced use of the open air elevated lines in New York by all of its garlic eaters might make it possible for the rest to ride in comfort in the subway. There is no end to the possibilities that are opened up. It was the late Mr. Whitridge, then receiver of the Third Avenue Railway in New York, who said that he didn't improve the rolling stock of some of his lines because there was no sense of putting people who apparently never bathed into surroundings with which they were utterly unfamiliar. Of course he stretched the thing a little, as was his wont as a practical joker. He did what little he could about it. The Turk apparently is more militant. The gastronomic special will never be realized, but if advices so far at hand are to receive credence it will probably not be because the Turk has not tried. In any event it will be interesting to have further information on the effect of the order.

Interborough Labor Controversy Has Several Angles

HASTY conclusions should not be drawn from the decision of Justice Wasservogel in the Interborough Rapid Transit labor case. Certainly, the decision is not the sweeping victory indicated in the statement of the organizer of the Amalgamated Association to the effect that "the absolute justice of our cause has now been established." As the *Wall Street Journal* has forcefully pointed out, nothing in the decision as reported in the press touches upon the asserted right of the company to lay down such conditions of employment as it pleases. The court simply refuses the Interborough an injunction to restrain the national union from soliciting Interborough employees to join its ranks. It affirms the right of the company to make as a continuous condition of employment for each individual in its employ that he will not join any particular union. Reduced to its essential the present decision is that the agreement which the railway requires of all of its employees to sign is on its face inequitable and therefore not the kind of a contract which a court of equity will protect. The court ruled that whatever the status of the contract at law, there was no compensating consideration where an employee abandons all right to leave the service of his employer, whereas the company reserves practically entire freedom to discharge him.

In the various comments on the case the instance of the United Mine Workers is mentioned and also that of the more recent decision of a federal court in Texas under which the Southern Pacific Company has been required to recognize a national union which claimed to represent the road's clerks, instead of the union with no affiliations outside the company. As between the Interborough case and that of the mine workers, there would seem to be an apparent conflict, since in the mine case the Supreme Court upheld an injunction which prevented the United Mine Workers from soliciting membership among the non-union miners in West Virginia. Whether the conflict here is real or only apparent depends, of course, on the nature of the two contracts.

The Southern Pacific litigation, just decided, involves both questions of law and of policy far reaching in their importance. The questions of law arise out of the construction of the so-called railway labor act passed in 1926. The questions of policy may be briefly stated to be whether the local employees on a railway shall be free to conduct their negotiations with the management in their own way, or whether they shall be dominated and controlled by an outside organization. The position of the company was that in dealing with the local association, which its clerical employees had formed on these lines, the company felt that it was representative not only of a majority of the clerical employees, but that it was a local organization that would have more vitally at heart the success of the railway enterprise in which both management and men were engaged, and the welfare of its members as a whole, than the clerk's union dominated by central powers from abroad. The company has determined to carry the case up on appeal.

So much for some of the technicalities. Within the limitations imposed by the 5-cent fare the Interborough has shown itself ready to deal liberally with its employees. It has even indicated that if the proposal for an increase in fare is successful, the men will participate to a greater extent than at present in the earnings of the company. But even at the present rates of pay, there is no indication that the roster of the company is not always full. A condition of this kind certainly indicates that the scale of pay must be fairly comparable with that which obtains in other lines of work similar to the railway service in the conditions that are exacted from those engaged in it. That, of course, is just one way of looking at the matter. If it would seem from the court's decision that the company has perhaps been over-zealous in the lengths to which it has gone in its efforts to protect all its employees, the reason for its concern was very well expressed by the Amalgamated's own organizer when he said following the court's ruling that "we intend to hammer our way through to victory whether or not stubborn Bourbons oppose our progress." This statement appears to leave little doubt as to the identity of the aggressor.

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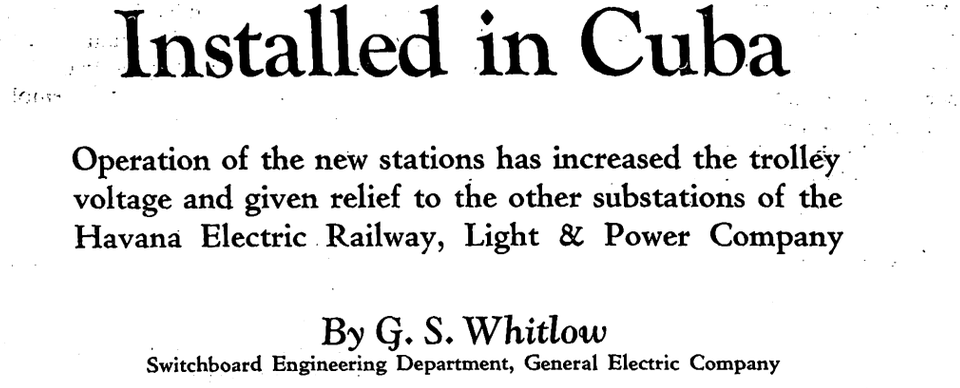
Two Automatic Substations Installed in Cuba

Operation of the new stations has increased the trolley voltage and given relief to the other substations of the Havana Electric Railway, Light & Power Company

By G. S. Whitlow
Switchboard Engineering Department, General Electric Company



Principe, Cuba, automatic substation, built to carry railway, power and lighting loads. A similar station has been built at Toyo

PERHAPS the most interesting recent installations on the island of Cuba are two automatic substations recently put into operation for the Havana Electric Railway, Light & Power Company, one in Principe, the other in Toyo. They are arranged for automatically supplying railway, power, and lighting loads. Power is brought in through 13,200-volt, 60-cycle, three-phase underground feeders and is stepped down to 4,000 volts for a.c. distribution, or converted into 600 volts direct current for the street railway system.

Prior to the new installation, the distribution system of this company included eight outlying substations, four for railway, power and lighting loads, two for railway loads only, and two for lighting loads only. All of the a.c. distribution, except for three 6,000-volt feeders from the power plant, is at 2,300 volts, three-phase. Voltage in each feeder is regulated by a bank of two induction regulators connected in open delta. The 600-volt railway system is ungrounded with two overhead trolleys.

The exterior of the Principe substation is shown in one of the views. The other, located in Toyo, is identical in construction. Both are of reinforced concrete, having a single story with basement, and built to withstand the cyclones experienced in this climate. Neither building is soundproof but with all the doors closed the machine noises are barely perceptible outside. The transformers are installed in fireproof compartments with doors opening on the outside. These may be seen closed in the view of the station and opened in another illustration. On the main floor of the Principe substation, shown in one of the engravings, are the truck equipments, d.c. switchboards, synchronous converter, and power transformers. Space and conduit runs have been provided for a second converter and future d.c. feeders. The voltage regulators, current limiting reactors, station service transformers and storage batteries are located in the basement. Provision has been made for two additional 4,000-volt feeders, as may be seen in the illustration of the basement.

Ventilation of the machine room is by louvers below the main floor level in three of the side walls. The air passes out through rotary-type roof ventilators. The transformer compartments have forced ventilation, the cool air entering through louvers below the grille-work floor on which the transformers are set, while the warm air is forced out by individual motor-operated fans in the roof. When an oil circuit breaker closes, energizing a transformer, the ventilating fan motor for that transformer is automatically started.

Each substation has a 13,200-volt underground tie to a substation that was formerly fed solely by overhead feeders from the power plant. This makes it possible to feed all substations in the system by underground feeders. This is desirable because of the severe windstorms which

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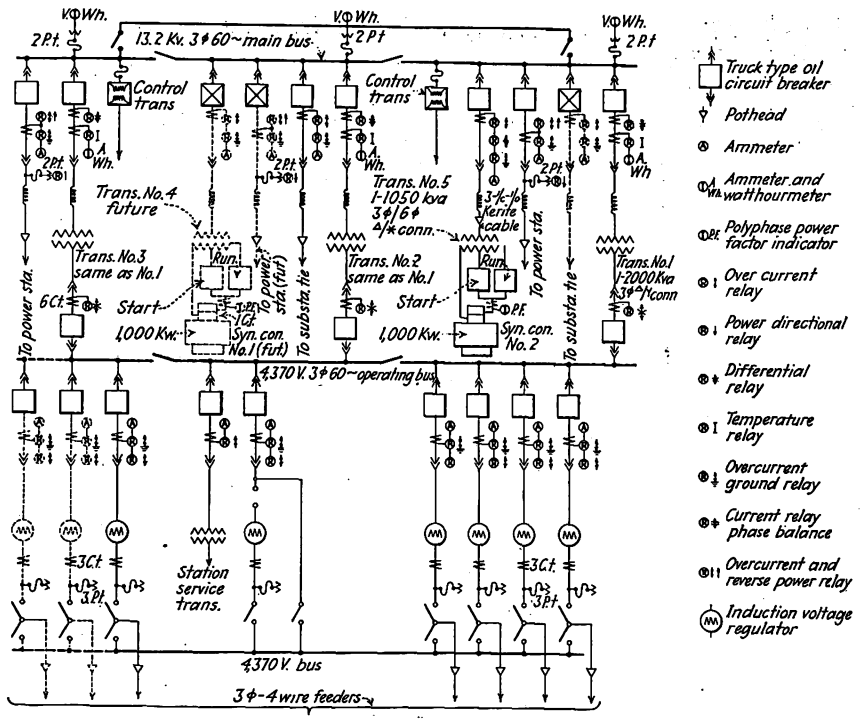
sometimes damage the overhead lines. All incoming and outgoing a.c. feeders are three-conductor, paper-insulated, compound-filled, lead-covered underground cables. The power connections inside the substation are single-conductor, rubber-insulated, flame-proof cables.

The Principe substation equipment, listed in an accompanying table, includes three transformers, rated 2,000 kva., 13,200/4,370/2,530 volts, three-phase, three-wire and 60 cycles. The neutral on the low side of each one is grounded. The synchronous converter is rated 575 volts d.c., 1,000 kw., six-phase, six-wire and 60 cycles. It is shunt-wound and started from the 50 per cent transformer taps. Eighteen induction voltage regulators, a station service transformer bank and feeder, a 1,050-kva. transformer with 50 per cent taps in secondary and automatic selector supervisory equipment are also installed in the substation. The Toyo substation is identically equipped except there are only two 2,000-kva. transformers.

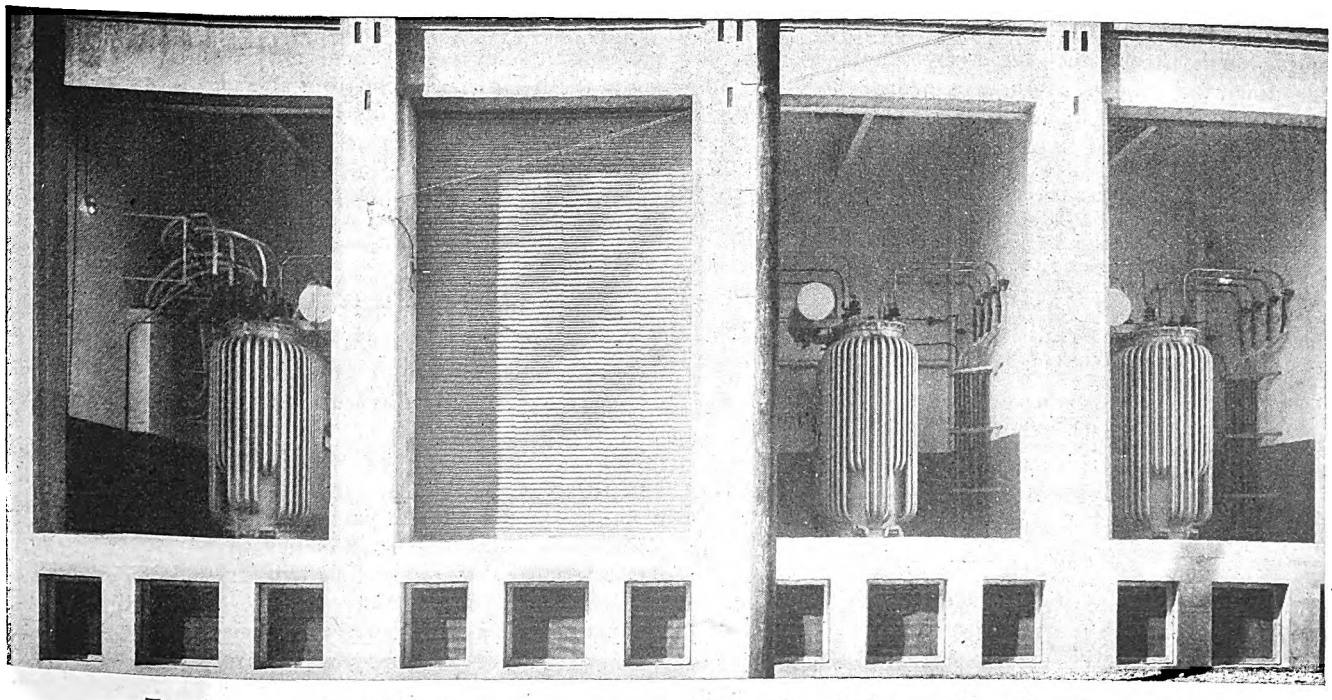


Wiring diagram showing relation of the many relays and meters. The broken lines indicate future installations

The incoming line circuit breakers will close automatically when three-phase voltage of the correct phase rotation is impressed on them. If trouble occurs on either line, the breaker in that line will open by the action of the power-directional and over-current relays. When the breakers in the power plant are closed again manually, after the trouble has been cleared, the substation breakers will reclose automatically.

One of the power transformers is normally connected to the load. Should the 4,000-volt a.c. load increase to slightly more than full load in the first transformer, and be sustained for a predetermined time, the second transformer automatically will be brought into service. Similarly, the third transformer is connected when the load exceeds the predetermined value for two units. Should any transformer fail the next transformer in sequence takes its place. When the trouble on the faulty transformer is cleared it automatically resumes its original place in the sequence. Differential relays protect against internal transformer faults, and thermal relays provide protection against continued overload. By a manually-operated transfer switch transformers No. 1 and No. 3 can be interchanged in the leading and trailing sequence positions to equalize the service.

The substation tie feeder has a transfer switch for local or remote control. In the local position, the tie breaker can only be operated by a control switch mounted on the breaker truck. In the remote position it is con-



Transformers are installed in fireproof compartments with forced ventilation, opening only to the outside

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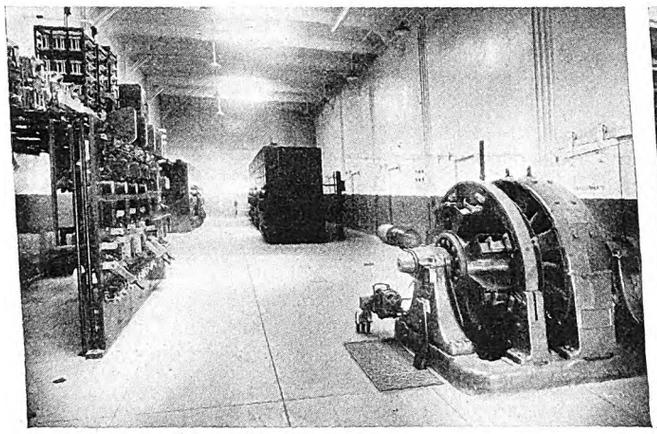
trolled entirely by the supervisory equipment from the dispatcher's office. This feeder is provided with overload protection.

The 4,000-volt a.c. feeders are protected with inverse time delay overload relays, arranged for three reclosures at 30-second intervals. If the overload persists after the third reclosure, the breaker will be locked out and must be reset manually. If the breaker is tripped manually by the control switch, the automatic reclosures will not take place until the breaker is again closed by the control switch.

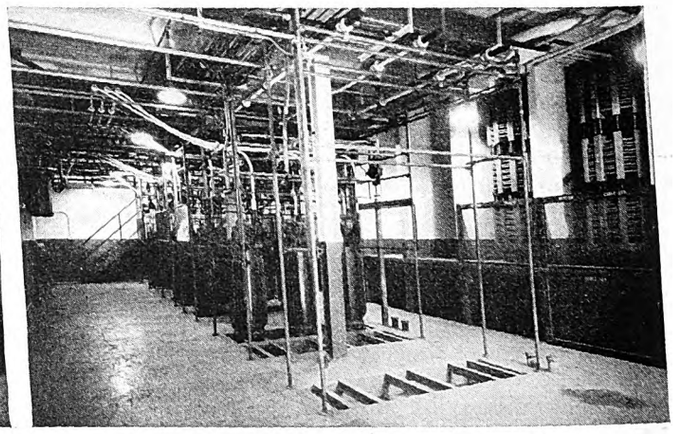
The synchronous converter equipment is arranged so that with low trolley voltage, persisting for a predetermined time, the converter will be started and connected to the load. This equipment is protected against low a.c. line voltage, single or reverse phase conditions, internal machine faults, a.c. overload, overheated winding, overheated bearings, overspeed, reverse power and flashover. The equipment is also arranged with load limiting resistors in order that the machine will not be connected directly to a heavy load so that it would cause a disturbance to the system, and so as to limit the amount of overload carried by shifting part of this load to adjacent substations. If this limited overload is carried long enough to overheat the resistors, the machine is shut down until the resistors have cooled. Normal trolley voltage and light load will shut down the converter after a predetermined time.

The automatic d.c. reclosing feeders will trip at a predetermined current. If the overload disappears they will reclose after a definite time, on either stub or multiple feed from either direction.

The automatic supervisory equipment used in these substations is of the selector type. It controls and indicates the position of the substation tie and indicates the position of all other breakers and the d.c. line contactor. In the dispatcher's office is the key and lamp cabinet in which are located the keys for sending out signals, and the red and green indicating lamps. Any change in the position of a substation breaker closes a circuit through an auxiliary switch, starts a motor-sending key and releases the corresponding code wheel which sends a series of impulses out over the line wires to the dispatcher's office. A selector relay having the same code setting is caused to move to the operating point and close an auxiliary relay which changes the indicating lamp. A bell also rings to notify the operator. A similar sequence of operations takes place when the dispatcher, desiring to operate a substation breaker, turns the proper selector key. The dispatcher also is provided with a means of checking the position of any supervised devices.



Interior view of the Principe substation showing the positive d.c. board, equipment for the 4,000 and 13,200-volt trucks and the 1,000-kw. converter



Voltage regulators, reactors and service transformers are located in the basement. Note the provisions for installing two additional feeders

EQUIPMENT OF THE PRINCIPE AUTOMATIC SUBSTATION OF THE HAVANA ELECTRIC RAILWAY, LIGHT & POWER COMPANY

All apparatus is designed for three-phase 60-cycle circuits except as indicated.

Two a.c. incoming lines, each 13,200 volts, 5,000 kva. maximum.
One a.c. substation tie line, 13,200 volts, 500 kva. maximum.
Three transformers, each 13,200/4,370/2,520 volt, 2,000 kva.
Six a.c. feeders (one transfer), each 4,370 volt, 300 amp. maximum, neutral grounded.
Eighteen induction voltage regulators, 250 amp., 2,300 volt, single-phase, with three connected in Y and neutral grounded.
One station service transformer bank and feeder, 4,370 volt, 50 kva.
One transformer, 13,200/430 volts, 1,050 nominal kva., three-phase, three-wire/six-phase, six-wire, step down with 50 per cent taps in secondary.
One synchronous converter, 575 volt d.c. 1,000 nominal kw., six phase, six wire, shunt-wound and started from the 50 per cent transformer taps.
Four d.c. positive feeders (one transfer), 600 volts, 1,500 amp.
Three d.c. negative feeders, 600 volts, 1,500 amp.
One storage battery, 60 cell, 120 volts.
One automatic selector supervisory equipment for controlling one oil circuit breaker and indicating the positions of ten oil circuit breakers and one d.c. line contactor.

The installation of these substations resulted in an increase of trolley voltage in heavily loaded areas, lengthening the life of the car motors and permitting better car schedules; relief of the distribution load on other substations by the installation of new 4,000-volt feeders; and the removal of load from one distribution substation, which will be abandoned in the near future.

Car Efficiency Increased

CHICAGO SURFACE LINES cars made a new record last year for mileage operated without mechanical failure. The average car was run 24,168 miles without a failure of any of its equipment of sufficient importance to require its being taken off the street and out of service. This is an increase of 10,961 miles in operation per car as compared with the previous year and indicates an increase in efficiency of 83 per cent. The better record is made possible by careful maintenance.

During the year 1,591 of the 3,639 cars owned by the company were sent through the shops for complete overhauling and repainting. On this schedule, practically every car will be completely overhauled, repainted and put in first-class condition once in two years.

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New terminal buildings at Burlington, East Troy and Watertown provide facilities for interchanging car and bus passengers under cover. This view of the Burlington station shows express platform at rear of building

Service First

Is Milwaukee's Transportation Slogan

PART II

By Charles Gordon

The Milwaukee Electric Railway & Light Company's program of anticipating the transportation needs of its community has resulted in major improvements of city service and the development of a comprehensive co-ordinated bus system

THE construction of rapid transit facilities for Milwaukee and the improvement of interurban service has been paralleled by service improvements on street railway lines within the city. One of the first departures in the development of Milwaukee rolling stock was made in 1919 when the first sample three-truck train was designed and built. In 1920, the first sample one-man, two-man car of the Milwaukee 800 type was built in the company's shop and was tried in service.

Back of the three-truck train was the idea of providing a more efficient means of handling rush-hour traffic, through the utilization of the existing equipment on the property. Adoption of this policy led to the double economy of cutting the cost of handling rush-hour business, while at the same time relegating the oldest equipment on the property to operation only a comparatively few hours a day during the rush periods. This made it possible to use money spent for new equipment, for the purchase of comparatively light-weight and efficient cars to be used on base schedules throughout the day. Introduction of one-man operation made it possible to give improved service through operation of cars at maximum possible frequency.

The standard of service in Milwaukee is unusually high and is enforced by the Railroad Commission under the following regulations:

On two-man lines all peaks of the rush period shall receive service on the basis of 67 seats for each 100 passengers.

All transition intervals of the rush period shall receive service on the basis of 90 seats for each 100 passengers.

Peaks of the non-rush period shall receive service on the basis of 90 seats for each 100 passengers, except that at no time shall the application of the standard require additional service for less than two round trips unless the ratio of seats to passengers is less than 67 to 100.

All normal intervals of the non-rush period where the traffic is not greater than 100 passengers per half hour shall receive service on the basis of 133 seats for each 100 passengers, provided that between the hours of 6 a.m. and 11 p.m. not less than a ten-minute service shall be operated except on certain divided outer ends of lines which shall receive not less than a twelve-minute service, and provided that on all lines between the hours of 11 p.m. and 1 a.m. not less than a fifteen-minute service shall be operated, and provided further that hourly service shall be operated on the principal lines from 1 a.m. to 6 a.m.

Normal intervals of the non-rush period where the traffic is greater than 450 passengers per half hour shall receive service on the basis of 110 seats for each 100 passengers.

All normal intervals of the non-rush where the traffic is greater than 100 and less than 450 passengers per half hour shall receive service upon the basis of a ratio of seats to passengers that gradually diminishes from 133 to 100, to 110 to 100.

At no time shall the peak (rush or non-rush) or transition service be less than the requirement for normal traffic in any half hour of the one hour preceding or following the peak or transition. At no time shall the transition service be greater than the rush-period peak requirement immediately preceding or following.

For one-man cars service has been furnished during the peaks of the rush period on an 80 seats per 100 pas-

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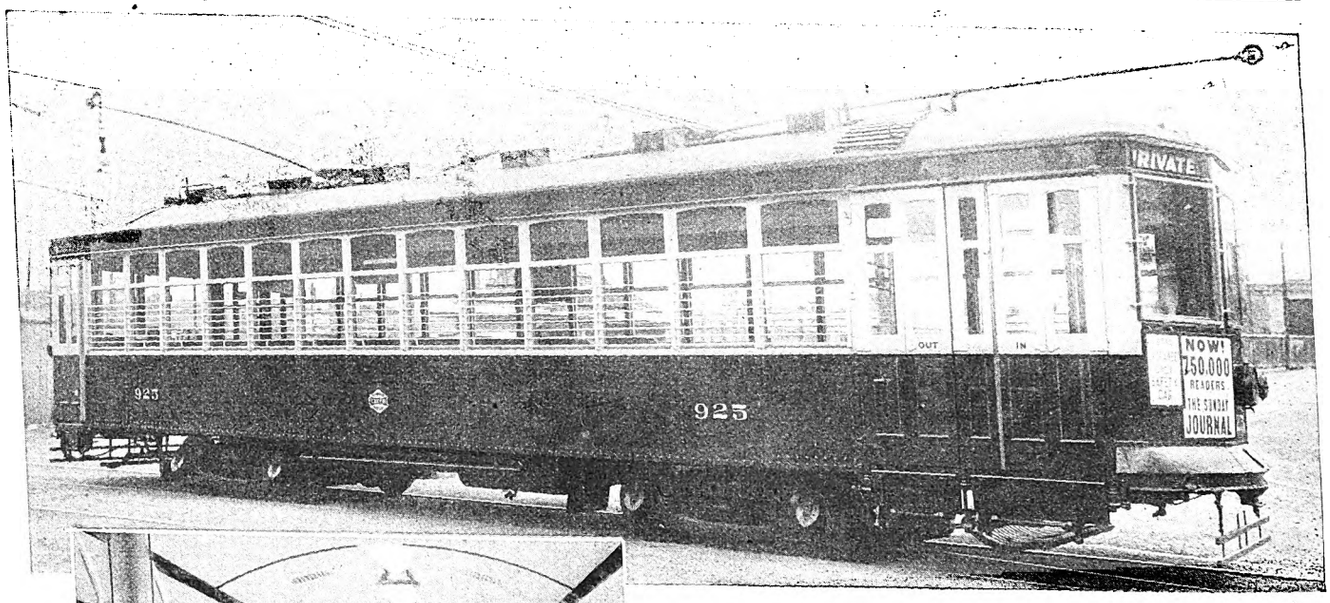
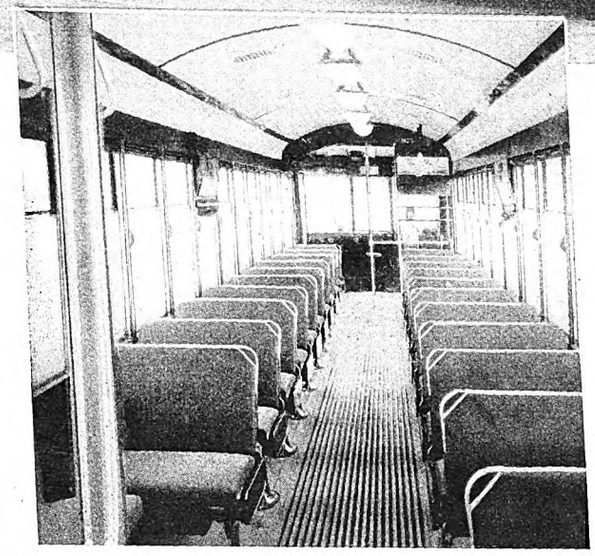




The most recent type of one-man car in Milwaukee includes many features for passenger comfort and safety. The lower view shows the interior of recent one-man city cars with center lighting, wide aisles and comfortable seats

sengers standard. No non-rush standards have been set except that it has been the practice of the company to increase the non-rush service by at least 20 per cent.

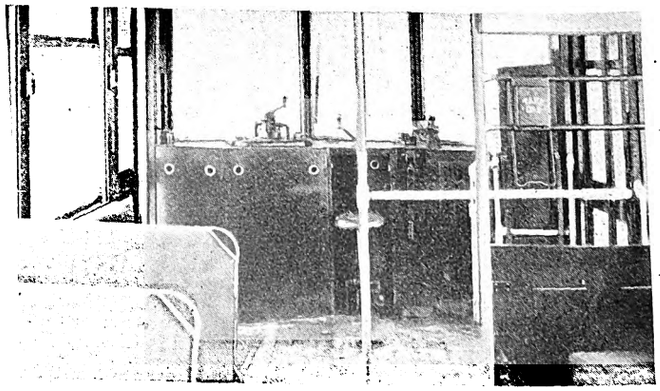
Additions and improvements to the company's equipment followed rapidly after the preliminary experimental work was done. In 1919, 60 Birney-type, one-man safety cars were purchased for service in Racine. From 1919 to 1925, a total of 165 three-truck trains were built from former double-truck bodies, and these were rapidly introduced on various lines in the city as soon as they could be put through the shops.

In April, 1920, a lot of 100 cars of the original 800 type, designed for one-man, two-man operation, were ordered from the St. Louis Car Company. These cars were all equipped with full safety car devices. In 1921, the 35th Street line was started with one-man operation, using ten of the new group of "800 type" cars. From this time until 1924, one-man operation was gradually introduced on several of Milwaukee's outlying lines. In 1923, another lot of 25 cars of similar type were purchased, and ten cars of the same general design, but shorter in over-all length, were added to the service in Racine.

By 1924 the further extension of one-man operation on lines operating through the business district of the city became an obvious necessity to make possible desirable service improvements within the limited income available from railway operations. An investigation was started in co-operation with the Wisconsin Railroad Commission. This led to a decision to give a serious trial to the use of one-man cars on a line operating through the congested district. In undertaking this step, automatic exit doors were introduced at the rear ends of the cars, and the operator's duties were further simplified through the introduction of electric heat and other labor saving and safety devices on the cars.

In January, 1925, the Clybourn line was started with one-man operation, these being the first one-man cars in regular service through the congested business district. Today a total of 217 cars, including ten new cars just being delivered, are arranged for one-man operation and are run on the 35th Street line, 27th Street, Center, North, Clybourn, Walnut, Oakland-Delaware, Wells-Downer, and State Street routes. Five of these lines operate through the congested business district. During the rush hours, the one-man car service is augmented with three-truck trains. The net result of the greater operating efficiency which is thus made possible by one-man operation is that the public has in every instance profited through a 20 per cent increase in service, while at the same time, operators of the cars receive increased pay.

Following the demonstration of the service improve-



Brake piping and controller have been inclosed on recent city cars for Milwaukee

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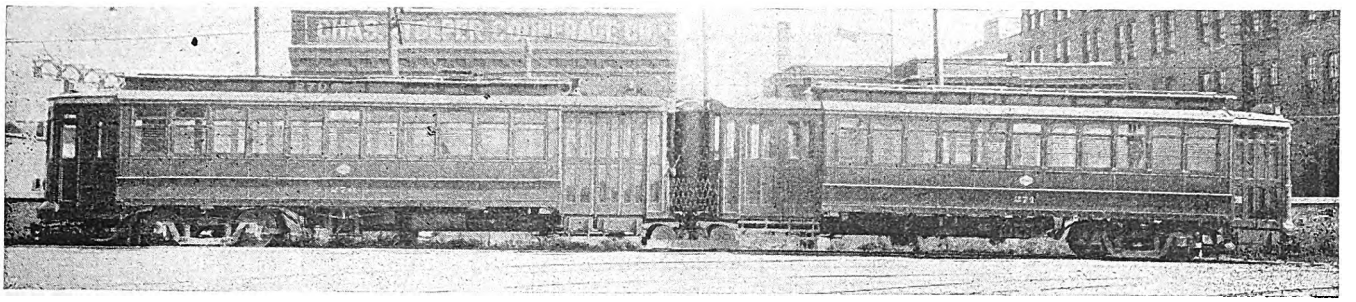
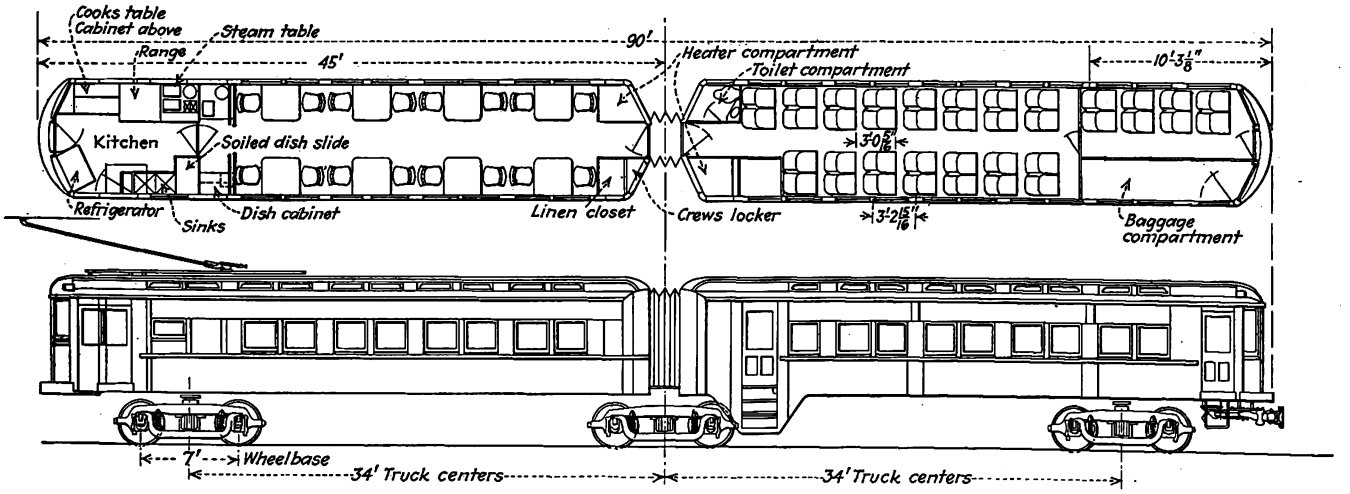


These three-truck trains in Milwaukee have proved very efficient for handling rush-hour loads economically



Plan and elevation of new articulated dining car unit for Watertown line

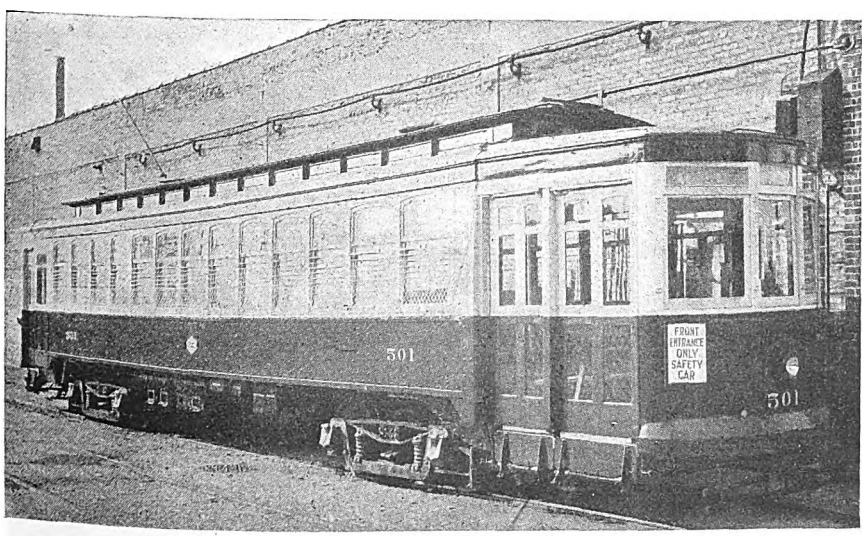
ments which are made possible through one-man operation, 40 more of the "800 type" cars were purchased in 1926, which included many features for improved passenger comfort, safety and operating efficiency. These cars are equipped with fabric upholstered seats, cabinets enclosing the controllers, electric heat, center lighting, and treadle exit doors with safety control. In 1927 ten more cars of this type were purchased and have just been delivered within the past few weeks. These cars have genuine leather-covered seats.

Additional one-man equipment was provided in 1926 by rebuilding twenty cars of the 500 type. In 1927 an additional lot of twenty of these cars were put through the shop and equipped with all the convenience and safety features for one-man operation that are included in new equipment purchased by the property. At the present time there are available for service in Milwaukee 737 city cars. In addition there are 54 city cars in Racine and thirteen city cars on the Milwaukee Northern property. Including the equipment of the Milwaukee Northern, there are in addition to this city equipment, a total of 109 interurban passenger cars available.

The Milwaukee Electric Railway & Light Company was one of the pioneers among electric railway properties in the operation of buses. It extended this service rapidly as the use of buses to supplement rail lines became better understood, and today furnishes both in Milwaukee and in the entire southeastern portion of the state a completely co-ordinated service which has been carefully built up step by step to complete the company's transportation service to the city of Milwaukee and to the surrounding communities in the state.

In the fall of 1921 there were a total of thirteen buses in service. Nine of these were used for feeders to city lines and for transfer connections. Four were put on roads adjacent to interurban lines of the company to meet the incroachments of independent competitors. Following this early experience with buses operated directly as auxiliaries of the rail service in the city of Milwaukee, an independent preferred type of service at a 10-cent fare was started in the city. During this period, also, interurban bus operation was extended rapidly to meet and anticipate the demand for bus transportation in the entire area of the company's operations.

Up to 1922, buses in use consisted of comparatively crude equipment with home-built bodies and in some cases light truck chassis with makeshift passenger bodies. During the year 1922



Type of car recently rebuilt for one-man operation with full safety equipment

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MILWAUKEE BUS OPERATION TYPES OF EQUIPMENT IN SERVICE

Make	Model	Type	Quantity	Seating Capacity	Weight Empty	Size and Type of Tires — Front		Rear		Operation	Average Miles per Day per Bus
White	1545	Sedan	1	11	7,210	36x6	HP.	36x6	HP. Single	Intercity	30
White	1545	Sedan	7	14	8,190	36x6	HP.	36x6	HP. Single	Intercity	131
White	15	Street Car	7	12	5,650	36x6	HP.	36x6	HP. Single	Intercity 1, City 6	58
White	50	Street Car	6	18	8,300	36x6	HP.*a*	36x6	HP Dual *e*	Intercity 4, City 2	99
White	50	Sedan	2	16	9,820	36x6	HP.	36x6	HP. Dual	Intercity	159
White	50-A	Sedan	5	20	11,200	36x6	HP.	36x6	HP. Dual	Intercity	154
Nash	2018	Street Car	1	17	7,400	36x6	HP.	40x8	HP. Single	City	54
Nash	3018	Street Car	3	17	7,400	34x5	Cush.	34x5	Cush. Dual	City	32
Fifth Avenue Coach	J	Street Car	16	20	8,900	36x6	HP.	36x6	HP. Dual	City	130
Fifth Avenue Coach	L	Double Deck	10	42	11,270	36x6	HP.	34x6	Cush. Dual	City	57
Fageol	4 Cyl.	Sedan*	5	19	8,920	36x6	HP.*b*	36x6	HP. Dual *f*	Intercity	90
Fageol	6 Cyl.	Parlor Car	13	19	11,000	36x6	HP.*b*	36x6	HP. Dual *g*	Intercity	111
Pierce-Arrow	6 Cyl.	Parlor Car	1	19	12,400	36x6	HP.	36x6	HP. Dual	Intercity	124
Packard	3-35	Sedan	1	11	6,800	36x6	HP.	36x6	HP. Single	Intercity	71
Rec	6 Cyl.	Sedan	1	17	7,420	32x6	HP.	34x7	HP. Dual	Intercity	80
Twin Coach	6 Cyl.	Street Car	2	34	15,450	36x8	HP.	38x7	HP. Dual	City	80
Yellow Coach	Z	Street Car	8	24	11,450	36x6	HP.	36x6	HP Dual	City	109
Yellow Coach	Z	Street Car	2	19	10,580	36x6	HP.	36x6	HP. Dual	City	82
Yellow Coach	Z	Double Deck	5	57	12,840	34x7	HP.	34x7	Cush. Dual	City	46
Yellow Coach	YZ	Street Car	30	24	11,600	38x7	HP.*c*	38x7	HP. Dual	Intercity 5, City 25	104
Yellow Coach	Y	Parlor Car	3	20	11,520	36x6	HP.	36x6	HP. Dual	Intercity	70
Yellow Coach	Y	Parlor Car	7	22	13,100	38x8.25	LP.	38x8.25	LP. Dual	Intercity	102
Hudson	Super six	Sedan	5	7	3,975	33x6.20	LP.*d*	33x6.20	LP. Single *h*	Intercity	64

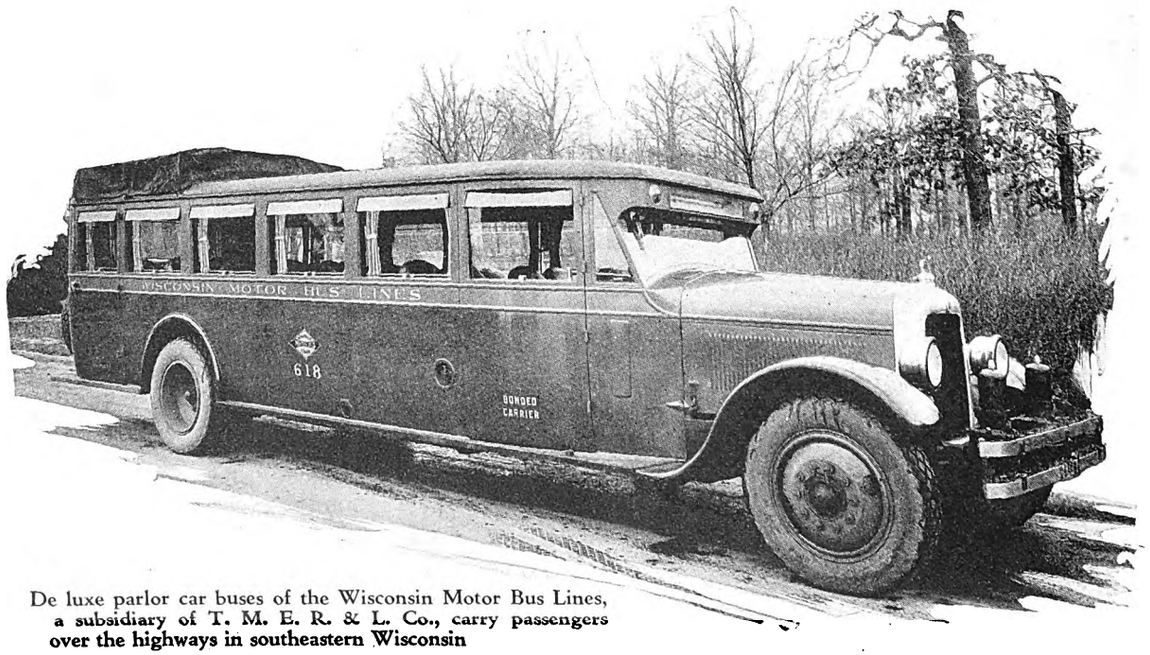
* One parlor car.
a Three have 38x8.25 LP.
b Two have 36x8.25 LP. Three have 38x8.25 LP.
c Two have 36x6 HP.
d One has 34x4.50 HP.
e Three have 38x8.25 LP.
f One has 38x7 HP single.
g Two have 36x8.25 LP dual. Three have 38x8.25 LP dual.
h One has 34x4.50 HP.

Note: HP = high-pressure tires. LP = low-pressure tires.

MILWAUKEE BUS OPERATION ROUTES, MILEAGE AND ROAD CONDITIONS

Routes *City Operation*	Mileage One Way	Mileage per Day — Monday to Friday	Saturday	Sunday	Condition of Streets
Oklahoma Avenue	2.8	405	388	319	Concrete
Lincoln Avenue	3.6	944	973	768	Concrete
Clement Avenue	.85	175	153	114	Concrete
Mitchell Street	1.68	485	518	362	55 per cent asphalt 45 per cent concrete
Lisbon Avenue	1.8	349	356	336	75 per cent concrete 25 per cent asphalt
Wauwatosa-North	3.57	469	432	364	Concrete
Wauwatosa-Vliet	3.4	334	334	316	Concrete
Green Bay Avenue	1.9	170	170	158	Concrete
Racine-Oak Park	.8	126	126	119	25 per cent brick, 25 per cent asphalt, 50 per cent concrete
Wisconsin-Prospect	6.4	1,461	1,585	1,256	Asphalt
Wisconsin-Washington	5.4	703	679	510	Asphalt
Wisconsin-Sherman	5.8	858	829	624	Asphalt
Intercity Operation					
Milwaukee-Waukesha	17.9	608	596	596	Concrete
Milwaukee-Oconomowoc	31.2	624	810	870	Concrete
Milwaukee-Hartford	37.4	224	224	224	Concrete
Milwaukee-Janesville	74.2	148	148	148	85 per cent concrete, 15 per cent macadam
Milwaukee-Hales Corners	6.7	65	79	....	Concrete
Milwaukee - Madison, Highway 18	88.6	530	530	530	Concrete
Milwaukee - Fondulac, Highway 41	62.7	627	627	690	Concrete
Milwaukee - Fondulac, Highway 55	65.8	263	329	263	Concrete
Fondulac-Green Bay	60.7	243	243	243	50 per cent concrete, 50 per cent macadam
Mayville-Theresa	5.6	56	56	56	Concrete
Janesville-Beaver Dam	79.1	316	316	316	Concrete
Janesville-East Troy	39.4	157	157	157	80 per cent concrete, 20 per cent macadam
Janesville-Watertown	52.3	105	105	....	Concrete
Racine-Beloit	69.1	415	415	415	Concrete
Racine-Kenosha	11.1	377	377	333	Concrete
Racine-Sturtevant	7.3	146	146	146	Concrete
Lake Geneva-Burlington	12.0	120	120	120	Concrete
Madison-Watertown	38.1	305	305	228	85 per cent concrete, 15 per cent gravel

the number of buses operated increased from seventeen to 76. The first 10-cent city service was started with ten model L Fifth Avenue double-deck buses on the Wisconsin-Prospect route. At about the same time, ten White model 50 chassis with street car type bodies were put into interurban service. Later, five Bender sedan bodies on model 50 White chassis were purchased for interurban service. These were followed with ten model 15 White chassis equipped with home-built bodies and used on interurban routes. Later, most of this equipment was transferred to city service. In 1923, nine single-deck type J Fifth Avenue equipments, and five double-



De luxe parlor car buses of the Wisconsin Motor Bus Lines, a subsidiary of T. M. E. R. & L. Co., carry passengers over the highways in southeastern Wisconsin

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deck model Z Yellow coaches were purchased for the extension of 10-cent city lines. During this year also, ten White model 50 sedans, seven White model 15-40 sedans and three four-cylinder Fageols were added to the interurban equipment. Interurban lines were operated at this period between Milwaukee and Waukesha, Milwaukee and Oconomowoc and Milwaukee to Racine and Kenosha. A number of short feeder lines to interurban rail routes were started about this time, but most of these, together with the Milwaukee-Racine-Kenosha bus line, have since been withdrawn.

During the years 1923-1924, interurban bus lines were started from Milwaukee to Madison, the state capital; Milwaukee to Fond Du Lac, Milwaukee to Hartford, Milwaukee to Janesville, and Milwaukee to Beloit. The first group of five Fageol six-cylinder parlor-car type buses were purchased in 1924. These, together with one Pierce-Arrow parlor car, were operated in long-distance tour service. New purchases of buses for interurban service have all been of the six-cylinder parlor-car type since this time. The present fleet consists of 150 buses of which 141 are in active service. A complete summary of Milwaukee city and interurban bus routes, mileage, equipment and other statistical data is given in accompanying tabulations.

Melbourne Trolley Becomes "Sun on Wheels" to Honor Duke of York

"HITCH your wagon to a star" is what Emerson said, but "Hitch your wagon to a duke" is the way it has been modified at Melbourne, Australia. When the Duke and Duchess of York visited that city the Melbourne and Metropolitan Tramways Board found it possible to honor the ducal couple and give the tramways favorable publicity at one and the same time.

The board was well entitled to any credit it could

Melbourne's "Sun on Wheels" to honor a duke

gain, for there were so many merrymakers on the streets that it was almost impossible to move the cars. Almost every day all trolley traffic was held up for several hours, during which period the platform wages went on as usual. On the day of the arrival all employees were paid time and one-half, with the result that the net earnings were actually 25 per cent under normal. For the ten days complete the tramway earnings were 6 per cent greater and the travel 7 per cent heavier.

If New York thinks it did well by Lindbergh, consider Melbourne's 500,000 celebrants in a city of 1,000,000 permanent population. This was the figure attained on the day of the big parade, when 25,000 "Anzac" veterans turned out to honor the ducal visitors.

Bourke Street, Melbourne's White Way, was more gayly illuminated than usual, but one of the most striking attractions was the board's car carrying 800 colored lamps and transparencies. The lights clearly showed every detail in private suburban gardens 100 ft. away. So it is not amiss to speak of Melbourne's "Sun on Wheels." The picture tells the rest.

Another Interurban Adds New Cars

The Kansas City, Leavenworth & Western Railway has placed four light interurban cars in service. Latest de luxe features give cars riding appeal

FOUR new passenger cars, lighter and speedier than those now in use, and designed to appeal to the public's love of comfort and beauty as well as to permit more economical operation, have been placed in service by the Kansas City, Leavenworth & Western Railway Company, operating an interurban line between Kansas City, Mo., and Leavenworth, Kansas. The new cars were furnished by the American Car Company, St. Louis, Mo., and will be operated with one man. The change from the former plan of using two men is part of the policy of cutting down operating costs, adopted as the most effective way of meeting the heavy bus competition the company encounters.

In commenting on the new cars W. H. Holmes, vice-president of the company, said: "We believe that the peak of the depression caused by bus competition has been reached. The electric lines have a legitimate place in the transportation field and by offering the public better service and improved, modern equipment they should be able to win back some of the patronage they have lost. We realize fully, however, that what will help more than anything else is cutting operating costs to the bone and placing the interurban business on a modern basis. We cannot continue with the equipment and methods of twenty years ago."

The four new cars will meet all regular service demands of the company. Most of the present rolling stock will be disposed of, the company keeping only such old cars as are necessary for reserve. The new cars weigh 33,000 lb. each as compared to from 75,000 to 88,000 lb. for the old ones. They seat 52 persons, which is approximately the same as the old, but the passengers will be carried at a great saving in power and in maintenance-of-way.

They embody all the latest features designed to make interurban travel more comfortable and safe and to make the electric car appeal to the public's liking for beauty in common carriers. They are 45 ft., 6 in. long by 8 ft., 6 in. wide, and are equipped with four 45-hp. motors as against four 75-hp. motors on the old cars.

Wheel diameters on the new cars are 26 in. as compared to 34 in. on the old ones. The old cars have cane seats. The new ones have individual bucket-type seats, upholstered in leather, with pneumatic cushions. The new cars have rubber tile floors, all-steel bodies, exteriors painted in red with blue roof, and finished on the inside in two-tone mahogany. An indirect lighting system has concealed lamps in a panel skirting the roof of the car.

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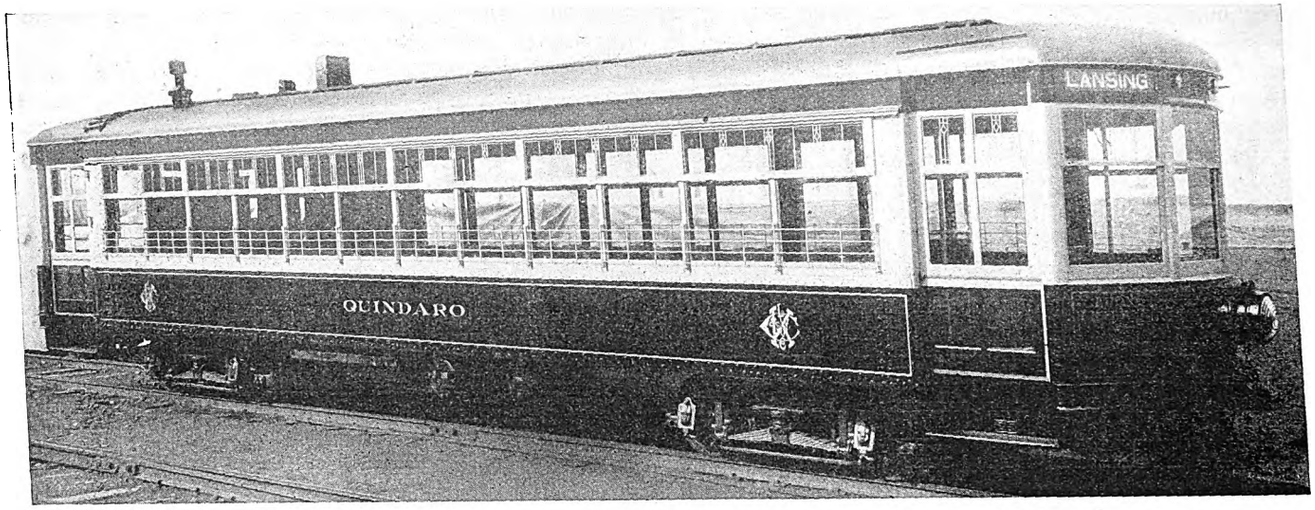


Exterior of one of the new cars of Kansas City, Leavenworth & Western Railway. The car is painted red, **with cream trimming and blue roof**

Light is reflected from a buff-colored, wood pulp combination dome. The roof is arched and the large windows make the new cars appear roomy.

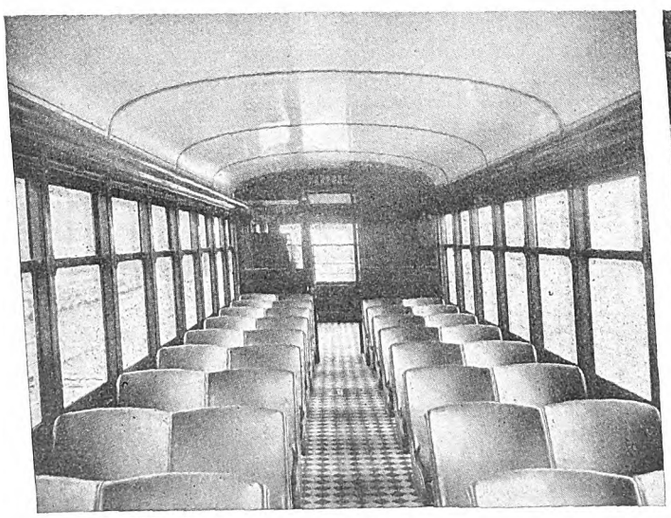
The front vestibules are of the semi-circular type. In the rear of each car is a combination smoking and baggage compartment, capable of seating twelve persons and with a square bus-like vestibule which imparts an observation platform effect. Low stream lines prevail throughout the cars and both front and rear doors are under control of the motorman.

General Rehabilitation Program Carried Out

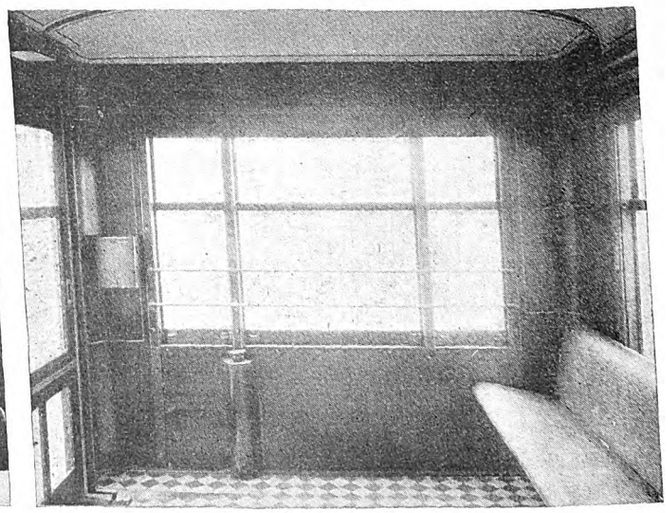
The company has put more than $100,000 into new equipment and improvements in the last year. Approximately $25,000 was spent in repaving and repairing car tracks in the city of Leavenworth; $10,000 in repairing roadbed and putting in new ties and rails between Kansas City and Leavenworth and more than $5,000 in repairing and putting in new freight switches all along the line.

The new switches will give the company freight connections with the Greater Kansas City railroad switching system, known as the Outer Belt, used by all the railroads centering in Kansas City, Mo., and Kansas City Kan., and their suburbs. They also provide connections with the Missouri Pacific railroad at Wolcott, between Kansas City and Leavenworth, with the industrial department of a home for the blind in Kansas City, Kan., and with the prison industries of the Kansas state penitentiary at Lansing, Kan., as well as with numerous private industries. The company will expand its freight business and hopes to increase its revenues greatly from this source.

The above figures do not include the cost of thirteen buses, purchased within the last three years to supplant the company's electric cars within the city of Leavenworth and to the United States army post at Fort Leavenworth, 6 miles away, and to the government soldiers' home, 3 miles from Leavenworth. The last of these buses were placed in service in October of last year. They enable the company to serve its patrons at these points more cheaply than could be done with the electric cars, and the buses are routed up the streets at the army post and the soldiers' home, bringing transportation nearer to the patrons at these points than was possible with the interurban cars.



Bucket type seats upholstered in leather and rubber-tiled flooring provide comfort for passengers



Rear vestibule of one of the new cars—a longitudinal seat is used here

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The Stock Book for Stabilizing Stores

Particulars are given of a simple form of stock book, based on that used on many steam railroads. It has many advantages over the use of cards

By R. A. Weston
Special Accountant the Connecticut Company, New Haven, Conn.

STEAM railroad companies of the United States 25 or more years ago devised a form of stock book as a means of ordering materials for replacement of stock materials. The advantage of the book was that there could readily be derived from it information on what the consumption of a particular item of material had been over a period of time, so that replacement orders could be based upon the actual history of the past as to consumption. The book quickly grew in favor and is probably the best device now in use for the purpose of regulating the stock. A brief explanation of this form and how it is used may be of some interest.

In its simplest form an outline of the book is as shown in the accompanying illustration. It is to be noted that there is no column on this form to show consumption of material or material issued. The usual form of stock ledger sheet or stock card has spaces on which all daily issues of stock from the stores are posted and permits of a perpetual inventory. It necessitates a great deal of clerical work.

THE A. AND B. RAILROAD COMPANY

Description of Material	Average Monthly Consumption Previous Year	JAN			FEB			MAR			APR				December		
		On hand	Due	Ordered	On hand	Due	Ordered	On hand	Due	Ordered	On hand	Due	Ordered		On hand	Due	Ordered
Trolley wheels 5½ spec. 0234	400	500	300	300	300	600	200	400	400	100	550	100	100				

This form of stock book has many advantages over card listing

The stock book here illustrated is used in the following manner. It is kept in the stock room itself and not in an office apart from the stock room. The man who physically handles the stock keeps the book. Once a month there will be prepared in the book a stock-replenishing requisition in the following manner. The storekeeper and the stock clerk will make the round of the stock room. In the first column, for the month in question, headed "On Hand," will be entered the actual quantity of the item in the bin. It will be perceived that this means an actual inventory of the stock room once a month. The bins must be mostly open shelving, with no concealing bin fronts, and the materials physically arranged in order so that they can be counted by inspection without physical handling. The unit piling system needs to be followed.

In the next column, under the word "Due," is entered the quantity previously ordered on requisitions and not yet received. This will consist of all the unchecked items in the preceding third columns, a check mark being made against the item from the receiving record when the material is received. The next entry is to be made in the third column by the storekeeper, who decides upon the quantity to be ordered. He is governed very largely in fixing this quantity by what the book shows is being used.

An illustration will show how he calculates this. On Jan. 1, for the item illustrated, he finds that he has 500 on hand and 300 due on order, and the book shows that during the previous year his consumption averaged 400 a month, or he has on hand and due a 60-day supply. Assume that he decided to order 300. On Feb. 1 he has 200 on hand and 600 due. Not having received any during the month, and his stock having decreased from 500 to 200, he sees that he has issued out 300 during the month. He cuts his order down in February to 200. On March 1 he finds that he has 400 on hand and 400 due. This indicates that he has issued out from Jan. 1 to March 1 the amount on hand Jan. 1 (500) plus the amount received (400) less the amount on hand March 1 (400), or the issues have amounted to 500, an average of 250 a month for that period. He cuts his March order down to 100. He could safely have omitted to order in March. On April 1 he has 550 on hand and 100 due. The consumption in three months has been 750, or an average of 250 a month for the period. The storekeeper is reducing his monthly orders in order to regulate his stock to the basis of his issues. After the stock room has been gone through and all entries made in the book it is turned over to a stenographer to type up the requisition.

Advantages Set Forth

Some of the advantages claimed for the stock book system as here described are the following:

1. The order is based on personal inspection and inventory of what is on hand. It avoids what may be a costly mistake in ordering from a card record figure where some clerical error may have been made in posting to a card.
2. It forces an orderly and systematic arrangement of the storeroom and of piling the stock due to requiring an actual inventory monthly.
3. The psychological effect is good of determining on the quantity to order when facing the material itself and realizing its comparative costliness.
4. When thousands of items are carried in stock it is a very laborious and slow process to consult individual stock cards for such information. The stock book very much facilitates the work.

Form With More Details for Large Companies

The form of stock book here illustrated is in its simplest form and is sufficient probably for a majority of street railway storerooms, and simplicity is quite an advantage. In the form shown, however, it is good for only one year and has to be written up new each year. This can be overcome by having the description column written or printed on a narrow page separate from the rest of the page, removing the latter only, each year.

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The principle of the stock book was recommended in the 1923 report of the committee on purchases and stores of the American Electric Railway Association, working in conjunction with the committee on stores accounting, and a recommended form of stock book was included in its report. This form is more elaborate and can be used for two years without rewriting. It has an additional space for showing the amount of unfilled requisitions, which is desirable in the case of a general store supplying divisional stores, but not necessary excepting for such a store. The form recommended by the committee provides for considerable additional information and permits of only seven items of material to a page of rather large size. The simpler form of book would permit of 30 to 40 items to a page of materially smaller size which is quite an advantage. It would also seem as though, with the simpler form, the figures for the calculations are more readily grasped and used. It might perhaps be said that the committee could well have included also in its report a simpler form of stock book that could be used in a majority of cases, while the larger systems would use the more elaborate form in their general storehouses. The report of the committee is referred to for detailed instructions covering the use of the book and for specifications for printing and binding.

As above stated, the system has proved its merit after more than 25 years service on steam railroads, and the opinion is ventured that the electric railways can adopt it in their storeroom practice with great advantage. It of course has to be supplemented by known conditions and work planned and in prospect, and it is the storekeeper's business to be supplied with this knowledge as well as the history of the immediate past.

Detroit Express System Benefits Motorists

Drivers of private automobiles and operators of trucks report big savings in time and general traffic improvement on Jefferson Avenue with express trolley system

DESIROUS of determining whether operators of private automobiles and trucks were benefiting by the combination express trolley and local bus service on Jefferson Avenue, the Traffic Survey Bureau of the Detroit Police Department sent out a number of letters requesting information relative to the use of the avenue before and after the express service was started.

Drivers of private automobiles were requested to give their average time from starting point to destination before express service was in operation, average time under present conditions and any other benefits or disadvantages. Operators of trucks or commercial vehicles were asked to list any benefits or disadvantages of the service to them and to state if any time was saved.

Practically every automobile driver who replied gave a favorable expression of opinion and reported a substantial reduction in traveling time. The time savings ranged from five minutes on a former twelve-minute run to twenty minutes on a former forty-five-minute run. The running times under the new system varied from 55 per cent to 89 per cent of the former times and averaged between 75 and 80 per cent.

Criticism of the system was scarce and concerned two unfavorable conditions: "bottlenecks" are formed at express stops by requiring traffic to go to the right of the safety zones and traffic signals are masked by the curtains on the safety zones.

A few of the replies from automobile users, typical of the large number received, are reprinted herewith:

Average Time From Home to Place of Employment in Minutes		
Former Conditions	New System	Benefits or Disadvantages
10	7	It's a great thing. I have noticed practically no jamming of cars since new system started. Practically no hold-ups.
35–40	29–30	Driving is easier and less crowded. Traffic moves faster and because there are fewer jams the accident hazard is reduced.
35	22	Fewer quick stops necessary as there are no pedestrians crossing the avenue except at car stops. I consider this express service to be the best improvement in traffic handling in Detroit.
28	23	I find that due to the non-stops the traffic moves more smoothly. General improvement. Good work.
30	24	The avenue is not so congested.
45	30	Think it a great advantage in every way.
40	30	Very much better. A big improvement and hope it is not changed back.
30	20	Much easier driving. Not so many stops and starts.
20	15	The express service has helped the motorist unquestionably.
60	45	I believe the express service has resulted in a time-saving not only to the auto owner but to people who must use street cars, buses or jitneys, as well.
12	7	Traffic moves smoothly without congestion or rush. Plenty of benefits and no disadvantages from the driver's viewpoint.
35	25	I want to endorse the new system heartily. It relieves congestion both for autos and pedestrians.
20	15	It's the best thing the city did since it took over the street railway.
25	15	Formerly used the bus but now use the street car because of a saving in time.

The truck operators who replied were as enthusiastic over the new system as were the private automobile drivers. All reported a saving in time. Many pointed out that they were able to operate more trucks and that operating costs were reduced.

Some of the comments of the operators of commercial vehicles follow:

Is Any Time Saved	Benefits or Disadvantages
A considerable amount	A noticeable speeding of traffic is a result of the express service on East Jefferson. We are pleased that it has been placed in effect.
Considerable	I find it expedites traffic and saves us money inasmuch as we can make more trips.
Yes	It appears to be safer.
Yes	It speeds up traffic and enables us to make more money by being able to carry more loads on our trucks.
Yes	Traffic isn't tied up so frequently. It saves the driver's nerves and patience.
Yes	It saves gasoline by not having to stop and start so often for the street cars.
Considerable	It saves wear and tear on the trucks by not having to stop for street cars every other block.

Rubber Used to Reduce Noise and Vibration on Cars

RUBBER is being used by the Market Street Railway, San Francisco, to reduce noise and vibration in street cars. Pure rubber pads, five-eighths of an inch thick, are used to insulate the car bodies from the trucks, thereby preventing the transmission of gear and other noises to the car body itself. This idea is following out one used by automobile engineers for several years, in using pure rubber pads to insulate the engine from the frame of a motor car.

New cars will be equipped with this device when built, and old cars will be fitted up at the rate of about eight per week.

The adoption of this scheme has followed many weeks of experiments, and tests show an appreciable reduction in noise.

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Manuals of

Operation and Accounting

By H. E. Jordan

Assistant Engineer Los Angeles Railway, Los Angeles, Cal.

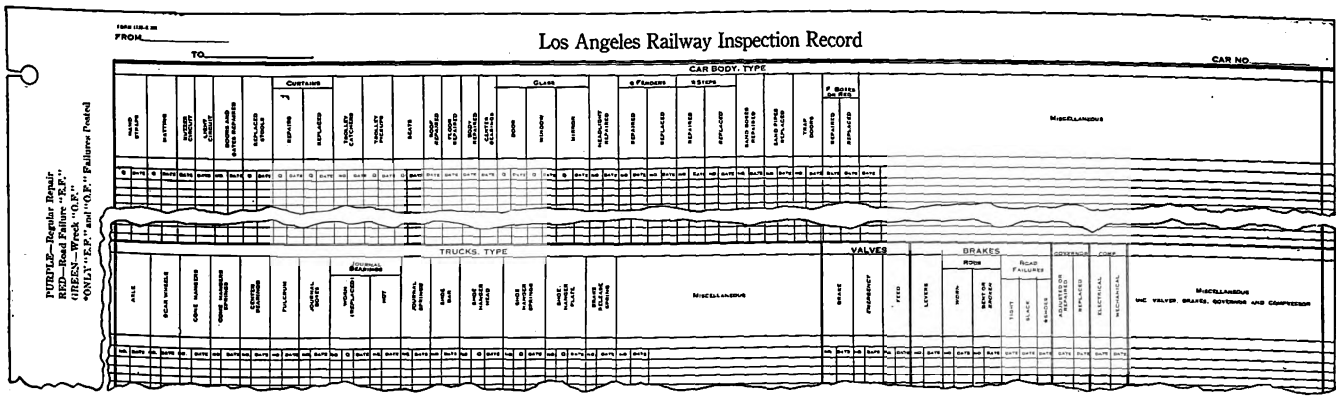
COMPILATION and issuance of manuals of operation and accounting to each employee of the Los Angeles Railway, Los Angeles, Cal., has proved a very effective means of stabilizing the routine of its mechanical department. The primary object of these manuals is to set forth the duties, principles and practices of the department organization and certain general and specific rules for its operation, so that each member of the department may understand the requirements of his own position as well as those of the men with whom he works.

By reading these manuals, new men entering the organization learn the routine and become familiar with the requirements of their jobs in much less time than if they had it all to learn from the foremen and fellow workmen. This not only saves the time of the new men but that of the foremen and the other workmen as well. Men of lower positions may learn from the manuals the requirements and the duties of the positions above them. This gives a man a definite objective to which he may aspire, which is an incentive to an ambitious individual. Many internal conflicts and misunderstandings are avoided by having the jurisdiction of each office defined.

There are two manuals, covering organization, operation and inspection. One is for the five division carhouses that maintain the cars in regular service; the other is for the general shops that repair wrecks, do general overhauling and the work required by store and work order authorizations.

Inspection card rack located in carhouse foreman's office containing last inspection record of each car

The manual for the five division carhouses prescribes the routine rules of the operation of the carhouse organization regarding the proper handling of tools, fire-fighting drills, overtime, absence from work, etc. It sets forth the duties of the general foremen of carhouses and the duties of each office of that department branch, down to the workmen. Further it defines such terms as scrap, salvage and second-hand material, pull-in, equipment and operating failures and describes the use of certain forms that are to be used to make reports of



Each car has a ledger sheet, size 22½x11½ in., with headings for the common items of repair or adjustment. Motor, control and overhead repairs are entered on the reverse side of this same sheet

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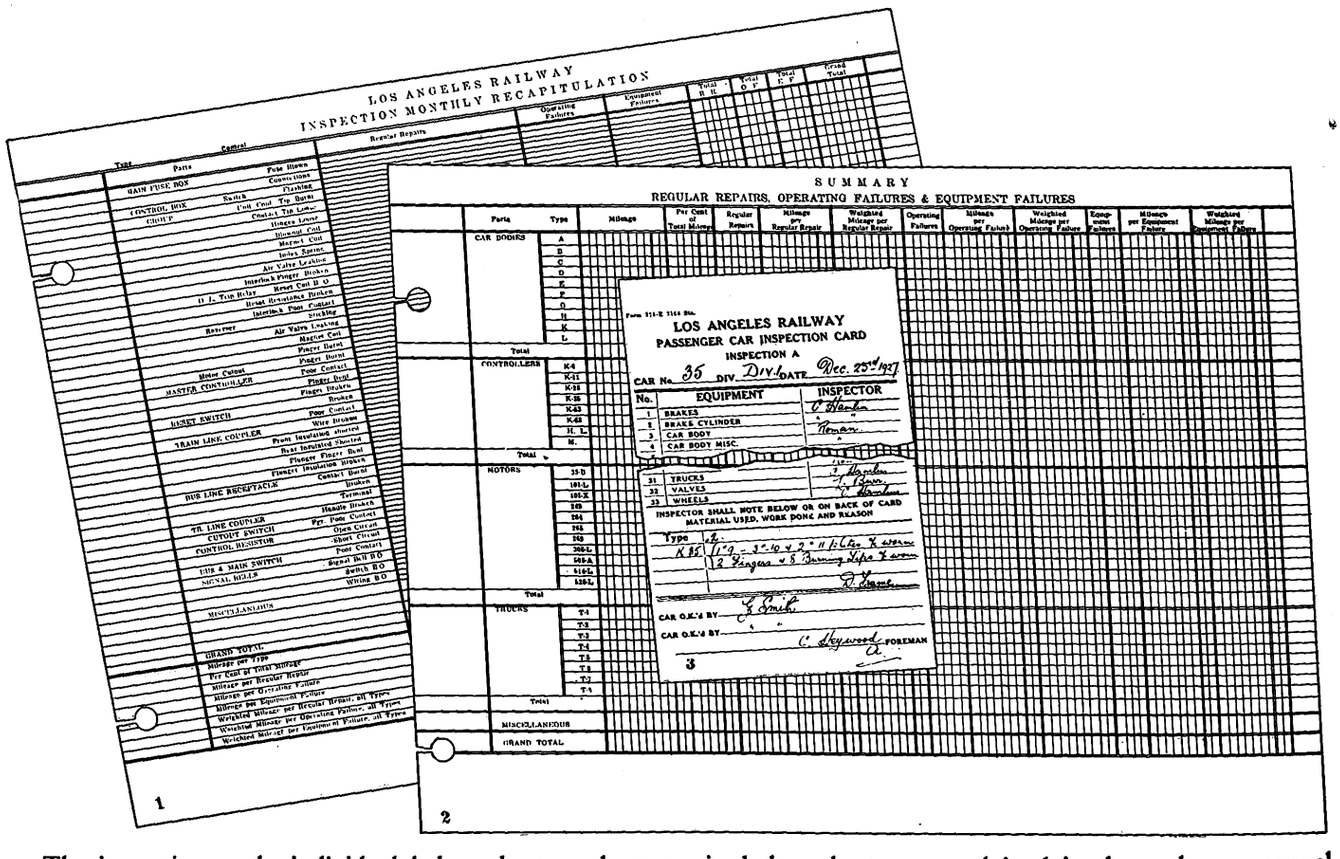
work done. It also prescribes the time limit of each inspection and specifically tells the requirements of each inspection, from the "safety inspection" that must be made each time a car leaves the carhouse yards, regardless of the mileage made, on through the "A," "B" and "C" inspections, which vary in degree of thoroughness with respect to hours of operation.

Inspection System Outlined

The inspection system which is outlined in the carhouse manual warrants a description here. A record of the number of hours operated is kept for each car by the office of the carhouse foreman, for the cars operated out of the respective carhouses. When a car is due for an inspection it is held in by the switchmen and the proper inspection card, whether "A," "B" or "C," is placed on it, in a card holder. Each inspection is classified under headings on the card, as body, brakes, control, etc. When a repair or adjustment is made the workman makes a brief notation of the work he has done and briefly states the reason the repair or adjustment was necessary, as, for example, "Replaced P.E. arm. brg. No. 2 motor acct. of worn." When the inspection is completed the inspector signs his name on the card opposite the equipment he inspected and the card is placed in an active card rack in the foreman's office. If a car has a failure while it is in service or it is necessary to do work on it for any reason, its inspection card is taken from the rack and placed in a "B.O. (bad order) car box." As the card contains the records of the previous inspection, the foreman very readily determines what inspectors and workmen are falling down in their work. After the workman completes the repair he notes briefly what he has done and why it was necessary on the back of the inspection card. When the next inspection is due on a car a new inspection card is placed on it and the old card is sent in to the master mechanic's office.

Each car has a large ledger sheet with headings for all of the most common items of repair or adjustment. All data are posted on these ledger sheets from the card by a clerk who enters the data under the proper heading. The difference between regular repairs and failures is indicated by the use of different colored ink. The equipment is also classified according to type, as various types of car bodies, motors, etc. The data contained on the inspection card are further posted on type sheets, with headings similar to those of the individual car. This classifies all the various repairs and failures according to what they are and the type of equipment on which they occur. This record is summarized at the end of each month, all repairs and failures are put on a "miles per failure" basis and a regular formal report is made. It is evident that from such a report the relative merit of types may be readily ascertained and the particular weakness of each type of equipment made apparent.



The inspection cards, individual ledger sheets and summarized data sheets are explained in the carhouse manual

No. 1. One of the six monthly inspection recapitulation sheets for posting repairs and failures of equipment. The size is 14¼x11⅜ in.

No. 2. Summary sheet of repairs and failures by types of equipment, put on a mileage basis. This sheet is also 14¼x11⅜ in. in size.

No. 3. Passenger car card for inspection "A." Work done by the inspector is noted on the bottom and repairs between inspections on the back. The card is 4⅝x11¼ in.

Manual for the General Shops

The shop manual prescribes the routine rules of operation of the general shop, defines the jurisdiction of each office and the responsibility of each position; gives the name, number and use of all mechanical department forms and practice in overhauling cars and equipment.

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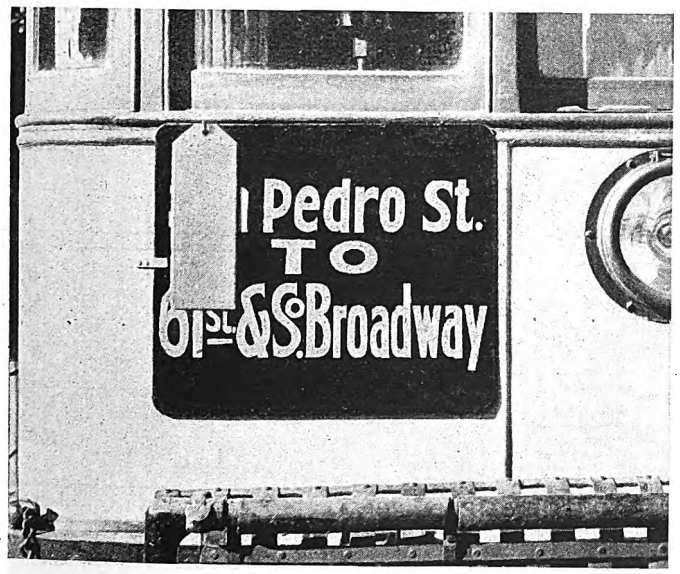
The company's accounting manual prescribes the general and specific rules pertaining to the charging and crediting of material and the charging of labor. The "Uniform System of Accounts for Electric Railways" prescribed by the Interstate Commerce Commission has been followed. However, some of the operating accounts have been divided into subheads to show certain segregations of cost. For example, Account 30-B represents maintenance of brakes; 30-C, car bodies; 30-T, trucks; etc. In addition to the segregation of charges by accounts, the charges are also segregated by types of equipment. The types of equipment are the same as those used in the inspection reports.

All of these costs are established monthly and are put on a cost per mile basis. However, complete written reports are made only quarterly. Three months is considered a sufficient period in which to eliminate severe fluctuations caused by an epidemic of repairs that may occur on any one type of equipment over a short period of time. The quarterly report shows the segregation between regular maintenance and general overhauling charges, summarized by types. Although the regular maintenance costs are segregated only by types of equipment, the general overhauling costs are segregated by individual cars and the detailed cost of overhauling these cars is furnished to the master mechanic's office by accounts. The combination of these two reports has eliminated the guessing or estimating of the relative merit of any type of equipment.



Inspection card in holder on car to be inspected

On a large system, where repairs are made by a large number of mechanics at several different points, it is impossible to spot many important weaknesses in the equipment unless classified summaries are made. The inspection report plainly indicates the weakness of the equipment by showing relatively large numbers of repairs and failures under the classified headings. Where these weaknesses are apparent the mechanical department makes an effort to eliminate them, and sometimes by relatively small changes effects a large reduction in operating costs, reduces equipment failures and thus betters the service. The cost report plainly indicates the most economical equipment to maintain. From it the engineering department may readily determine at what point in the life of the equipment it is economical to replace it.

It is vitally essential that every large electric railway keep records of repairs and failures. If these records are not kept up it is necessary to make special studies and investigations regarding the rumored reports of excessive failures and repairs of various types of equipment. When these studies are made, if no detailed record has been kept as the work was done, they are essentially based upon hearsay, or opinions of various workmen and foremen, which is at best a very unsatisfactory means of supporting important conclusions. We believe that it is more economical to keep a detailed record of repairs and failures, so that we may have ready reference on the actual conditions which pertain to all of our types of equipment. This record not only eliminates the necessity of making special studies and investigations but often has called to our attention certain weaknesses which had not been apparent prior to keeping this record.

Training by Individual Instructors in Atlanta

Demonstrations given on a moving car, courses of further study available for those who desire it

TWO features stand out in the instruction course given to new employees by the Georgia Power Company of Atlanta. One of these is an adaptation of some of the latest university methods and is the assignment of each student to one instructor who may have several other students assigned to him but not a large number. This instructor is expected to look individually after the work of each of these students and is held individually responsible for their progress. In collegiate work this is known as the "Oxford" system.

On the Georgia Power System there are two full time instructors and 63 trainmen who have been especially trained as platform instructors, employed in teaching new platform men the way of discharging their duties. As explained, every student is assigned to some one of these instructors. During his course of study he goes to various line instructors to learn the car routes, etc., but he returns to his original preceptor for the final phases of his instruction. Before this plan was begun a student was sent to one instructor one day, to a second the next day and to a third the following day to learn different phases of the work. The result was that no one instructor was responsible for his progress and no one took any great amount of interest in it.

Largely as the result of a scientific approach to the problem, the company has found it possible to reduce the period of instruction by 25 per cent, and at the same time turn out better qualified men. This is of benefit to the company through the more efficient use of the time of the instruction course. It is of equal benefit to the students in view of the fact that they are not paid during their period of instruction. Higher standards of intelligence and character of the applicant also are being required, and it is a real testimonial to a man's physique or intelligence to be selected by the company for the position of one-man operator. It makes the man feel that the job is worth something to him after he has acquired it.

A second important feature of the training course is the instruction car illustrated on this page. It is unique

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in that it is a skeleton car, at least on the inside, which can be operated over the road to teach the men the practical working of the machinery. It was remodeled from a four-motor, double-end car which had been retired from passenger service.

The flooring in the center was removed, leaving a walkway protected by a railing on each side. The line breaker is mounted above the floor and the air brake valves and piping are mounted above the center sills and painted a distinctive color. Door hinges, sprinklers and valves forming a part of the treadle step and door mechanism are exposed. The power wiring and door circuits are also exposed. The controller has a glass cover. The car is equipped with an economy meter and a voltmeter so that more intelligent instruction in power saving may be given.

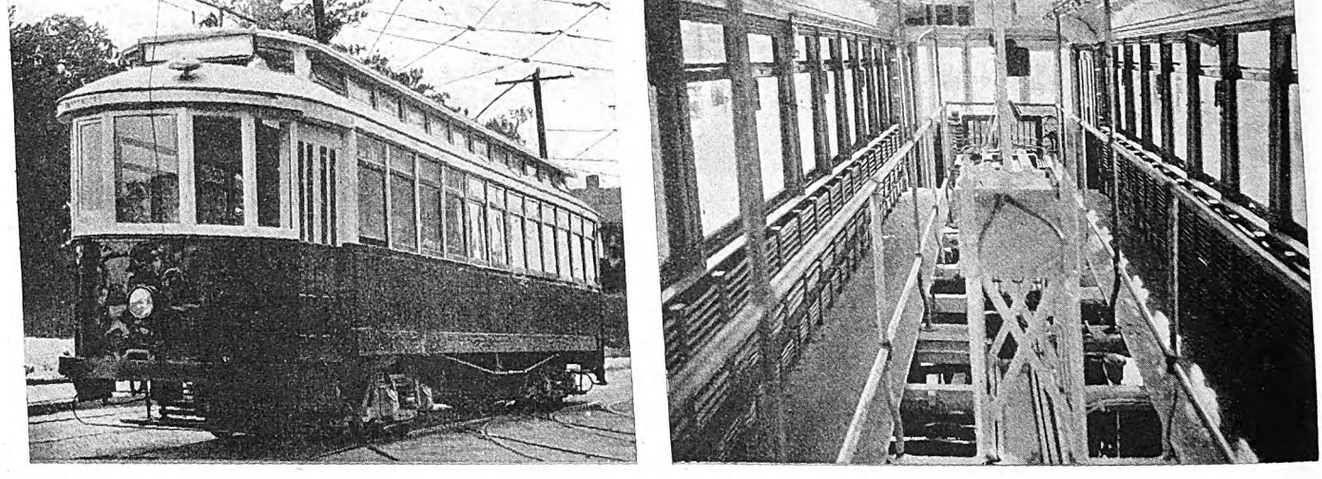
A group switch in the car is controlled remotely by eight snap switches, the snap switches opening and closing the unit switches in the group. The unit switches are used to demonstrate the most frequent troubles in the motor circuits, i.e., grounded armatures and fields, open circuited armatures and fields, grounded and open circuited resistances and short circuited fields and resistances.

The car is designed so that the instructor, by throwing the switches, can cause the various kinds of trouble. The student is then told how to operate the cut-out switches in the controller to clear up the trouble. After all parts of the mechanism of the car have been explained to him, the student is required to correct the various troubles and get the car in operation after the instructor has thrown it out of order.

The instruction of the men does not end with their technical training. Every man before qualifying has a talk with the safety director, who seeks to impress upon him the primary obligation of safety and his responsibility as a representative of the company. He then meets the superintendent of transportation for a personal talk. The company believes the benefit of these interviews cannot be overemphasized, as the student comes from them not only with a feeling of the importance of the job but with a knowledge that the officials, from the superintendent down, are backing him in his efforts to make good.

Those who finally qualify for service have the opportunity of pursuing their education further if they desire to do so. The men are encouraged to take correspondence courses relating to the public utility industry. The cost of such courses may be deducted from an employee's salary if he desires, and if he completes the course and makes a grade of 70 per cent or better the amount so deducted is refunded to him. The company also assists employees desiring to take night school or other courses, by arranging their hours of work. It was discovered a few years ago that 34 motormen could neither read nor write. Special classes for them were organized and all were given the rudiments of an education.

For the last three years the superintendent of equipment, his foremen and several of the point supervisors have attended a course in foremanship at the Georgia School of Technology. The results were so satisfactory during the first two years that in 1926 the company made arrangements for the entire supervisory force of the transportation, roadway and mechanical departments to take this course at the same technical school. The men attended on their own time and an average attendance of more than 90 per cent was maintained.



This old car has been fitted out for instruction purposes. The floor has been cut away to show the operation of the machinery. The wiring, air valves and other parts are also visible

P.R.T. Remarkable Example of Employee Participation System

THE Philadelphia Rapid Transit Company, Philadelphia, Pa., is cited as the most remarkable example in the United States of employee participation in management in a survey recently completed by the International Labor Office of the League of Nations. According to the report that company is particularly striking, "as the employees are in process of acquiring complete financial control." The 10,000 employees already hold more than one-third of $30,000,000 of capital, giving them two directors of eight on the board of management. In conclusion, the report states that the communication of information to workers' councils and the sharing with them of some of the anxieties of management have led to a better understanding of problems of industry by the workers.

The study was made by H. B. Butler, C.B., deputy director of the International Labor Office.

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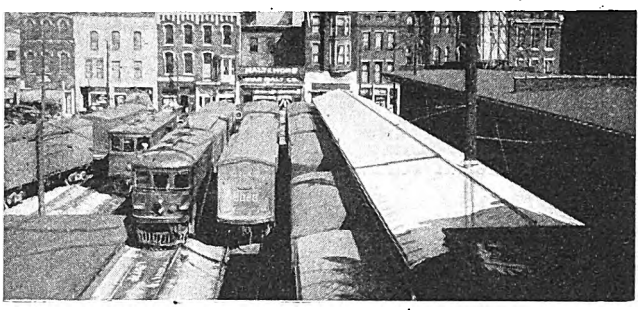
Columbus Freight Terminal Enlarged

Steady increase of freight business made the former building inadequate. Receiving capacity has been increased 70 per cent

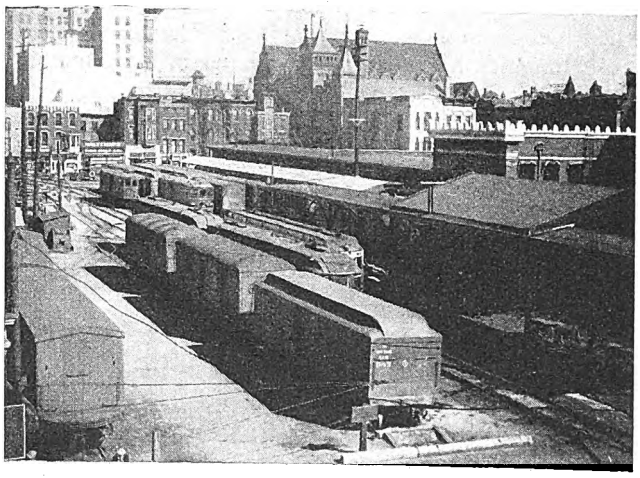
FREIGHT-HANDLING facilities of the Columbus Interurban Terminal Company were increased considerably by the enlargement of the previously-congested terminal. An extension, 41 ft. wide and 65 ft. long, was built on the freight house and the yard capacity increased to accommodate 30 cars. The extension has permitted an increase in floor space of 65 per cent, and an increase in the receiving capacity at the door of 70 per cent.

The effect of the changes was noticed immediately by the three roads which use the terminal, the Indiana, Columbus and Eastern Traction Company; the Southern Ohio Public Service Company, and the Columbus, Delaware & Marion Electric Company. Overnight service traffic between Columbus and the cities of Springfield, Cincinnati, Dayton, Fort Wayne, Detroit and Cleveland, as well as many intermediate cities, has picked up since the changes were made, according to reports. Before the terminal was completed many complaints were received from connecting lines about congestion. Since the new terminal has been placed in service, no more complaints have been received, it is stated, and many patrons have indicated that they were highly pleased.

Prior to 1911, all freight tonnage in and out of Columbus was small as compared with that of today. However, the terminal then in use was inadequate and a new one was constructed. The new freight terminal exceeded the abandoned station many times in size and exceeded the need of that day, but the management foresaw a sufficient increase in freight business to warrant the larger building. The terminal constructed in 1911 provided ample space for the efficient handling of freight, both in and outbound, until about 1922 or 1923 when congestion became quite noticeable. With the year 1926, which was the banner freight year of the company, the terminal was found to be inadequate and congestion was an every-day occurrence. Often three or four cars were standing under load in the yards from 24 to 48 hours.

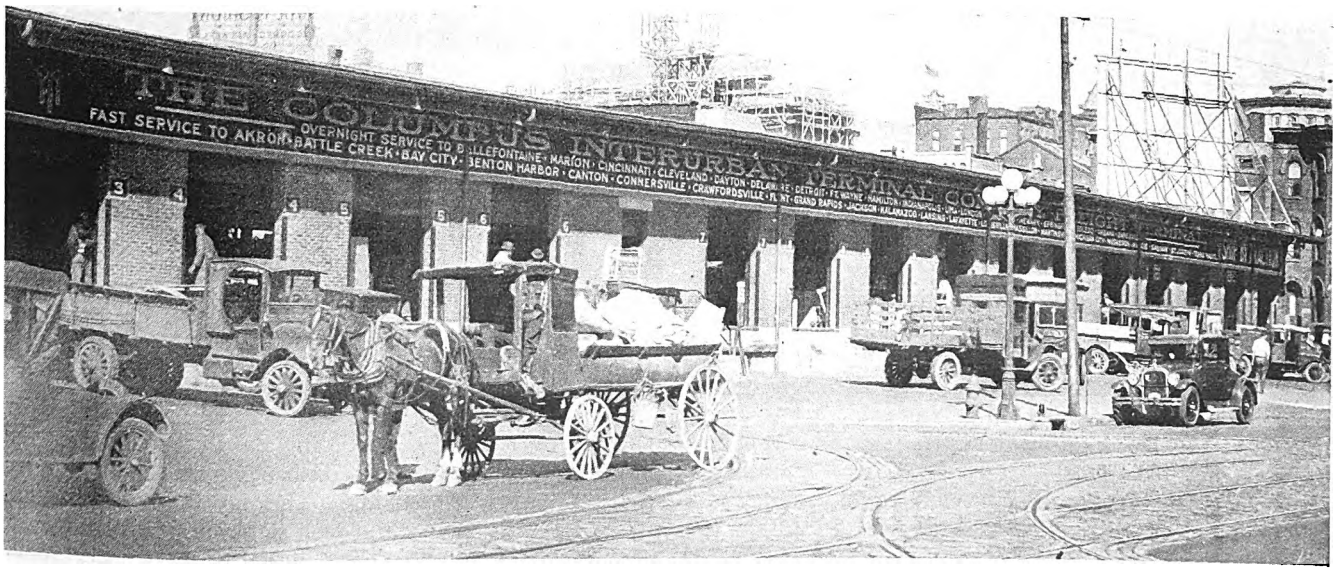


Track facilities of the terminal have been increased to accommodate 30 cars



The passenger station and the adjoining flatroofed freight house are back of the transfer shed in this view

Completion of the enlargement of the terminal was the occasion for an inspection and "get-together" party at Columbus, Ohio, Oct. 27, attended by traffic representatives of most of the electric railway properties of Ohio, Indiana, and Michigan, shippers of Columbus, representatives of civic organizations in Columbus, and officials of the Indiana, Columbus and Eastern Traction Company, who sponsored the party. Details of this meeting were given in a news item appearing in the Dec. 24, 1927, issue of the JOURNAL.



Seventeen service doors are provided in the present terminal for inbound and outbound freight

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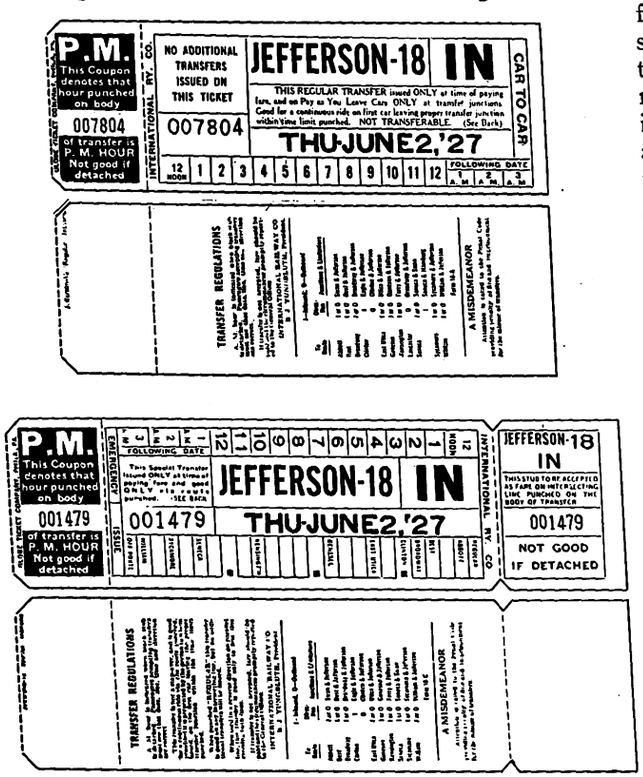
Buffalo Transfer Embodies New Features

Design recently adopted to meet conditions of International Railway, including use of one-man cars and universal privileges

By P. C. Snow
Vice-President Globe Ticket Company

EVERY transfer system, good, bad or indifferent, must include certain essential features, which are: (1) The date the transfer is issued; (2) the route or routes to which a passenger may transfer; (3) the time when the transfer privilege expires. The care taken in presenting this information determines in large measure the success or failure of the transfer system. Adherence to the basic principles involved will go a long way in cutting down, if not eliminating entirely, many of the transfer evils which long have been the bane of transportation men.



Front and reverse of new Buffalo transfers

The regular transfer (at top) is good on one car only, while the special transfer is accepted on two cars. In a few instances additional transfers are issued.

The transfer designed and laid out for the International Railway, Buffalo, N. Y., in co-operation with its transportation engineers, is an excellent example of how these results may be accomplished. The study was directed by two engineers, but the employees, including co-operatinve committeemen, supervisors and trainmen, had no small share in the development of the transfer. In the opinion of the writer as close to a perfect transfer for the purpose as has yet been done has resulted. Whether the idea they have worked out can be adapted satisfactorily and used by all roads throughout the country is a question. However, it has been in use in Buffalo for several months and it is reported that results have been most gratifying in every way.

The accompanying illustrations show the two forms in use. The first or regular transfer is good on any line intersecting the issuing line, and requires no line punching. The second or special transfer is issued to cover rides requiring three or more cars. The operator punches the intersecting line, and on that line the stub is lifted, the passenger retaining the body of the transfer, which is collected on the third car. In a few rare instances riders may require four or five cars to make a journey. For these rides the issuing operator punches the word "issue." Only when this word is punched out of a special transfer does the operator of the second or later car issue a transfer on a transfer.

At the beginning of each half trip operators punch out the time, allowing a reasonable margin to cover slight delays in making connections. Thus all punching except for the unusual ride is eliminated from the line, greatly speeding the issuing of transfers. There has been a material simplification from the former transfer. This reduces the time taken by the issuing operator and makes it easy for the receiving operator to scan the transfer on acceptance. This reduction in time is essential for one-man operation, and at the same time decreases abuse given both by operators and by passengers.

The form adopted is what is known as a "line" transfer, the issuing line being indicated by color and by printing in large letters on the face of the form. The issuing date is surprinted in red on the face. On the regular form the transfer point and route are not punched, but instead inbound and outbound forms of different colors and with distinctive printing are used. On the reverse of the transfer is a list of the legitimate transfer routes and points allowed. The receiving operator has no difficulty in identifying the transfer and determining whether it is good on his line at the stop where the passenger boards and in the direction in which he is traveling.

Buffalo has adopted the hourly time limit, following the trend toward simplification. It has been found by experience that this restricts the passenger with a reasonable degree of accuracy, and it is felt that the fractional hour limit is not practicable for pay-as-you-pass and pay-leave collection, both of which were used in Buffalo when the new transfer was first employed. Buffalo cars are now 100 per cent one-man operated, and with the exception of four crosstown lines the method of fare collection is pay-enter inbound and pay-leave outbound. It is also easier for the issuing and receiving operators, particularly on one-man cars, to punch and inspect the hourly limit. As to the abuse, there is comparatively little to be lost with the hourly basis, since the average conductor is usually liberal when punching the fractional-hour transfer. The use of transfers long expired is obviated by the "P.M. coupon," which is torn off all transfers issued before noon. The difference in length and appearance is unmistakable.

Preceding the introduction of the new transfers, a series of newspaper advertisements prepared the public for the change. These advertisements illustrated both the regular and special forms of transfers, and discussed the conditions of use, telling the patron what to do to obtain the correct transfer. These were published in the daily papers for four days preceding the inauguration of the new system. Beside this, dash signs called attention to the newspaper advertising. The day the new transfers made their appearance the dash signs carried the wording, "Need a Transfer? What Lines, Please?" Bulletins in the cars also called attention to the new form.

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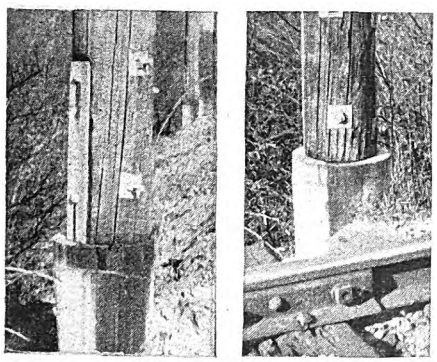
Maintenance Methods and Devices

Poles Butted With Reinforced Concrete

POLE butts of reinforced concrete have preserved for use almost 1,000 poles of the Pittsburg, Harmony, Butler & New Castle Railway and the Pittsburgh, Mars & Butler Railway. The method was devised by Harry Etheridge, vice-president



Two views of the completed butt, showing how the pole is bolted to the projecting tongues

and general manager of the companies. The method is economical, costing only $4.50 per pole. It is convenient as well, since the butts can be produced without disturbing the transmission or overhead.

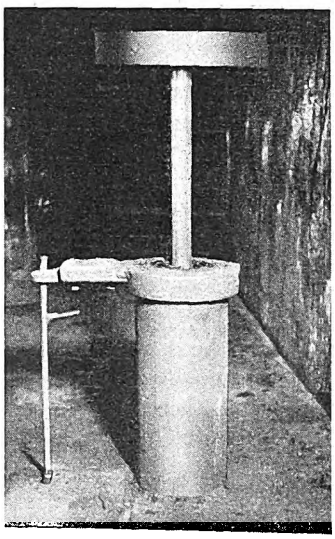
The reinforcing framework is constructed of open-hearth steel bars and rings. Three bars 2x$\frac{3}{8}$ in. and 5 ft. 3 in. long are welded to rings, as shown in the accompanying drawing. The lower ring has a diameter of 6 in. and the upper ring a diameter of 9$\frac{1}{2}$ in. Two bars 4x$\frac{5}{8}$x30 in. project from the lower framework and are welded to the lower bars just above the upper ring, as shown in the upper section view of the line drawing. They are at an angle of 90 deg. to each other and are drilled for $\frac{7}{8}$-in. bolts. Two bolts through each of the two tongues hold the sawed-off pole securely in position.

With the reinforcing framework in place, a specially constructed concrete form is clamped about the base. The form is 6 ft. high, of No. 16 galvanized-steel and in two halves, with flanges so the halves can be held together by external bolts. Fabric gaskets $\frac{1}{4}$ in thick are used between the faces. The inside diameter at the bottom is 10 in. and at the top 14 in.; so a layer of concrete approximately 2 in. thick surrounds the reinforcement in the completed butt.

A ring 3 in. wide and with a diameter of 14 in. is molded in the butt near the top and acts as an outside reinforcement. Three $\frac{3}{8}$-in. rods 8 in. long in chordal positions within the ring further reinforce the concrete at this point. The completed butt weighs 756 lb., of which 105 lb. is metal and 651 lb. concrete.

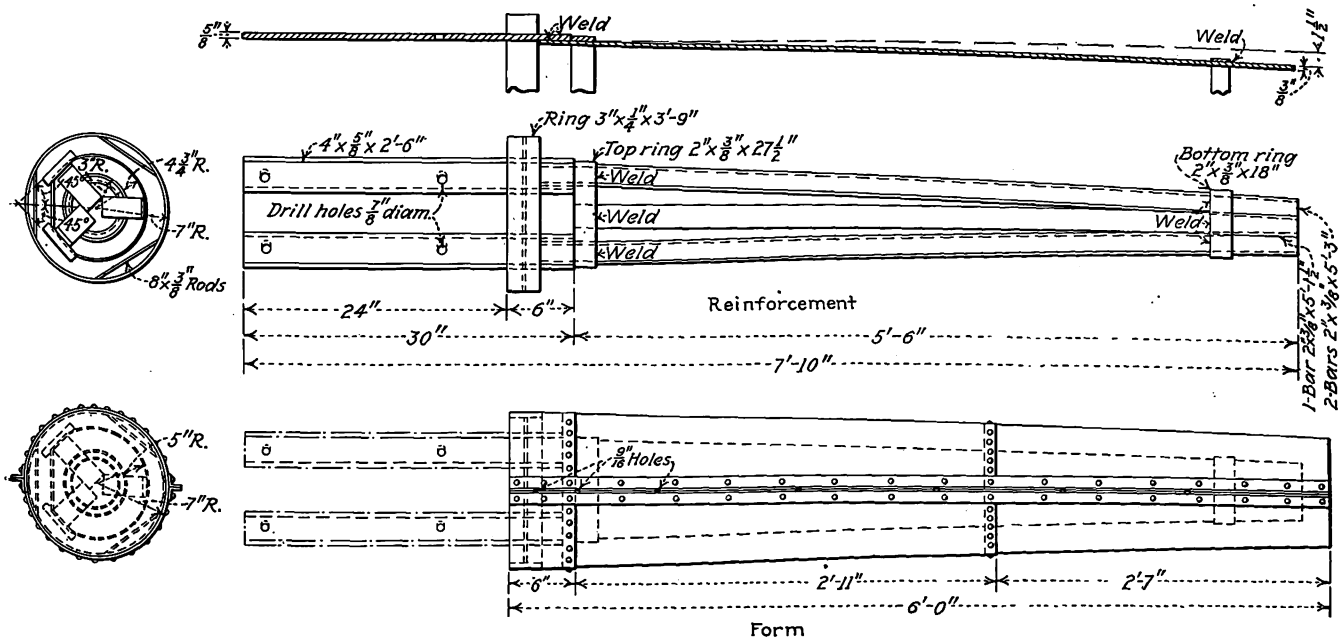
Hydraulic Armature Jack

REMOVAL and installation of armatures is done in considerably less time in the shop of the Binghamton Railway, Binghamton, N. Y., since the installation of a hydraulic



Jack in overhauling pit is an added convenience

armature jack. This jack, which is placed in the center of the pit floor, consists of an 8-in. iron pipe 6 ft. long, threaded on one end and set vertically so that about 3 ft. projects above the floor level. A 2-in. steel piston on one end and an oak plat-



The metal reinforcement and the concrete form used in the work. The upper section view shows how the tongues are welded to the lower bars

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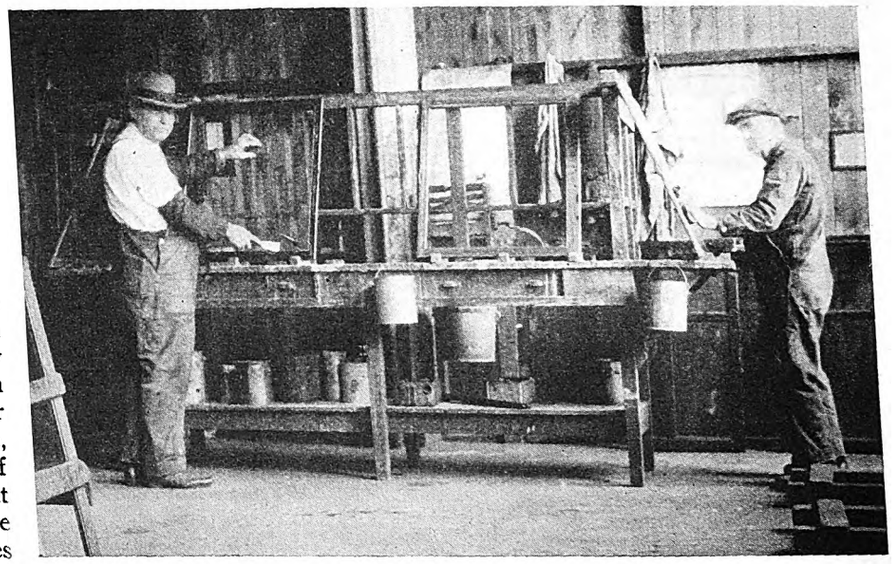
form on the other are installed in this pipe. The exposed end of the 8-in. pipe has a casting screwed on it which acts as a piston stuffing box and a support for the valve operating handle. A 2½-in. pipe connected to the city water system and the lower part of the 8-in. pipe through a ½-in. globe valve furnishes the water.

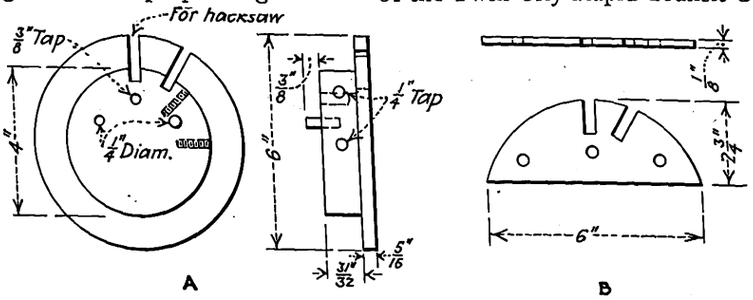
The operating handle moves in two directions. When it is thrown to the right it closes the drain valve and opens the city water valve, thereby raising the piston. When it is thrown to the left it closes the city water valve and opens the drain valve, lowering the piston. The motion of the piston can be stopped at any point desired by placing the handle in the neutral position where both valves are closed. The jack has a 5-ft. lift.

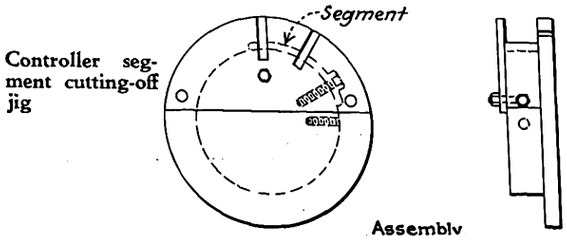


This table, with a rack in the center, facilitates the cleaning of car window sash

Controller Segment Cutting-Off Jig

CONTROLLER segments are being made at a substantial saving in the Woodside shops of the New York & Queens County Railway, Jackson Heights, N. Y., by the use of a simple device designed by controllerman John Hilbert. Burned controller segments formerly scrapped are now salvaged by cutting off the burned portion and using the shorter segment in other parts of the controller. This device is a cutting-off jig and is designed for cutting two lengths of segments. It is made of steel in two parts, *A* and *B*, as shown in the accompanying sketch. The main body *A* has a diameter of 4 in., is $3\frac{1}{32}$ in. long, and has a 6-in. flange $\frac{5}{16}$ in. thick. Slotting of the flange radially in two places permits the entrance of a hack saw blade to cut the segment to the proper length. The $3\frac{1}{32}$ in. surface of the hub is drilled and tapped for two ¼-in. machine bolts to hold the different lengths of segments. The 4-in. surface is drilled and tapped for a ⅜-in. bolt and provided with two ¼-in. dowels. The ⅛-in. plate, *B*, is drilled and slotted to line up with the slots, dowels, and topping in the hub of *A*. Plate *B* is designed so that the bottom edge stops above the center of *A* to allow for its application and removal without withdrawing *A* from the vise.





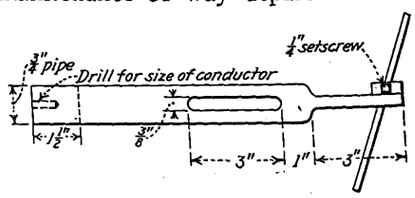
Controller segment cutting-off jig

Convenient Stand for Washing Sash

WHEN car sash are washed prior to installation, for the purpose of removing surplus paint, varnish or putty, it is often difficult to manipulate them so that all parts can be reached readily. To obviate this difficulty Joseph Gabler, foreman painter of the Twin City Rapid Transit Company at the St. Paul, Minn., shops, has designed and built the table illustrated. The bottom portion is an ordinary, sturdily built work table with drawers for holding tools and a shelf beneath. On top of this in the middle of the table there has been mounted a wooden rack, the height of which is correct for resting the sash at a convenient angle. Vertical rails make it equally suitable for smaller sash also. Notched cleats are fastened to the table top so that the sash will not slide off when rested against the central rack. Hinged extension shelves are fitted at the two ends.

Ventilated Welding Rod Holder

HOT WELDING-ROD holders caused considerable complaint from the operators of the shop and maintenance of way departments of the Binghamton Railway, Binghamton, N. Y., until Foreman Chapman designed a ventilated holder to eliminate the objection. It is claimed this holder can be used for any length of time under severe welding conditions and that it will remain at a temperature which will not cause discomfort to the operator's hands.



Details of ventilated welding rod holder

It consists of a ¾-in. pipe 16 in. long, flattened on one end for about

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3 in. A rectangular block riveted to the flattened end is drilled for reception of the welding rod. A hole at right angles to this one, drilled and tapped for a ¼-in. setscrew, holds the welding rod in any desired position. The other end of the pipe is filled with brass to 1½ in. from the end and is drilled for the conductor cable. The feature of this holder is a ⅜-in. by 3-in. slot cut through the walls of the pipe beginning about 4 in. from the end of the holder. This hole acts as a ventilating duct or port for the dissipation of the excess heat.

New Equipment Available

Another Gas-Electric Bus

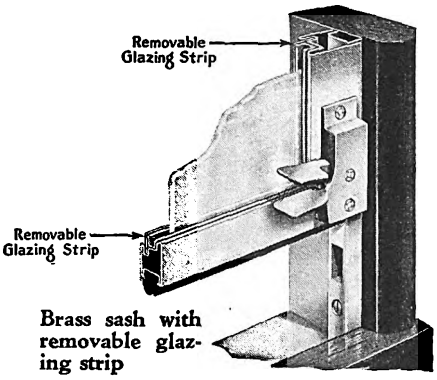
COMPLETION of design of a gas-electric drive motor bus has been announced by the White Company, Cleveland, Ohio. Several months of test have shown unusual power for the new equipment, it is claimed, and have demonstrated hill-climbing ability which permits severe schedules to be maintained without overheating.

The White six-cylinder 100 hp. engine has been modified and fitted with a new chassis for gas-electric service. Electrical equipment was developed in conjunction with the General Electric Company. The six-cylinder power plant permits larger and more powerful electrical equipment than has been customary. The new bus will carry a full load of passengers on fast bus schedules over hills which would tax the capacity of ordinary equipment. Although not designed for long distance work over open routes with few stops, it is suitable for routes combining suburban and city traffic conditions, and for intercity service.

The chassis is a complete unit, making it possible to mount bodies without alterations to the chassis wiring. In addition, attention has been given to the mounting of the motors and generators so that the work of removing any unit is simple. The generator is driven by a flexible steel shaft which runs through the generator to the commutator end, the drive being taken through rubber ball joints. The two motors are connected to the underslung worm-drive rear axle by short universal joint shafts, and the propellor shaft brakes are mounted directly on the rear end of the motor, thus forming a part of the motor design.

Sash With Removable Strips Make Reglazing Easy

WHEN brass window sash made its appearance some years ago, there was no provision made for quick reglazing in case of glass breakage. To provide for easy reglazing, the O. M. Edwards Company, Syracuse, New York, has announced a metal sash with removable glazing strips. With this feature, a new glass may be inserted quickly without removing the sash from the opening.



Brass sash with removable glazing strip

To insert a glass, sash strips are removed from the two side stiles and top rail, the new glass is placed in the opening and the strips are reinserted in their grooves. No screws are used to hold the strips in place.

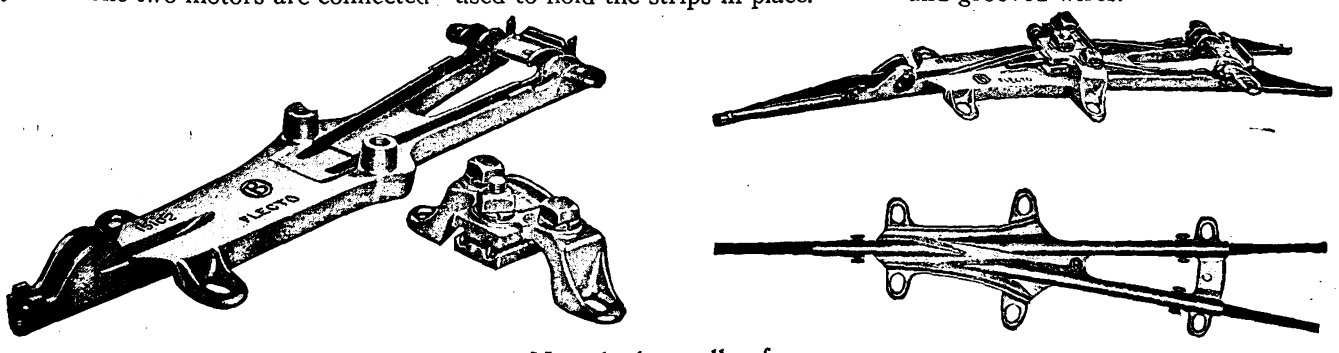
Duplex Trolley Frog With Detachable Pan

EASE and rapidity of replacement are features of the new Duplex trolley frog now offered to the trade by the Ohio Brass Company, Mansfield, Ohio. With this construction, a detachable suspension yoke and clamp become a permanent part of the overhead and permit replacement of a frog without disturbing the supporting span or trolley wires or losing the exact location of the frog being replaced. The suspension yoke is supported by cross-span wire for which pull-off eyes are provided. To this yoke is fastened by means of a ⅝ in. bolt the clamp which holds both trolley wires in relative positions. The frog itself is in turn attached to the yoke by two ⅝ in. bolts.

To make a replacement by installing the new frog the body or pan is released by removal of two bolts and the cam tips. With a Duplex frog in position there is no need to disturb supporting span or trolley wires when renewals are made since relocation and realignment need not be considered.

Long life is assured by special runners of liberal height, narrow cross-section and with extended overlap at the center of the pan. The runners are designed primarily to guide the wheel through the frog without break in contact and without permitting the flanges to touch the pan at any point. Current collection by the wheel alone, not by the flanges, results in longer wear for both frog and wheel. The Duplex frog and body suspension yoke are made of Flecto malleable iron, hot-dip galvanized, rust resisting and brittle free. The frog body is also equipped with pull-off eyes at each end for use when necessary and with the usual O-B cam tips which insure a smooth approach and leave. The same yoke is suitable for both right and left hand frogs.

The new type frog can be furnished for the usual sizes of round and grooved wires.



New duplex trolley frog

Special runners are provided of narrow cross-section and with extended overlap at the center of the pan.

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Association Activities

The Place of the Interview in Selection*

By Dr. S. M. Shellow
Psychologist, Milwaukee Electric Railway & Light Company

IN OUR zealous effort to introduce scientific methods in the selection of employees, we are likely to throw out any former devices which smack at all of subjective judgment. Those of us who have succeeded the old-time employment clerk with his systematized prejudices and intuitive hunches, have laid great stress on the error of personal judgment. So much effort has been expended in trying to correct the evils of the old-time personal interview by substituting objective tests that we have often leaned over backward in trying to stand up straight.

There can be no doubt of the value of properly standardized tests in determining fitness for a job, especially when they are checked by careful and reliable follow-up reports. But the test alone is insufficient. Again and again we find individuals who lie beyond the 60 or 70 correlation coefficient who do poorly in a test but make good on the job, or do well in tests but fail on the job. We might consider them as necessary errors in any selection procedure, or we might study the causes of success and failure and see whether or not they cannot be anticipated in selection.

There are still many traits which are necessary for the proper suitability to a job which cannot be adequately measured by tests. Personality is something more than a combination of various quantities of different traits. The whole may be qualitatively different from the sum of all of its parts. Behavior cannot be predicted simply on the basis of sufficient ability. There is a great difference between the ability to do a thing well, and the interest, desire and ambition necessary to employ that ability. Attitude greatly influences performance.

The interview is designed to supplement and interpret the test results. Its value depends upon its nature. Interviews range from rapid-fire cross-examinations to the thorough and careful searching of the personality characteristic of the psychiatric clinic.

Somewhere between those two extremes lies the practical interview for selection. The nature and extent of the interview depends entirely upon the nature of the job and the qualities which need to be brought out. There are, however, certain primary functions of an interview which make it an integral part of good selection procedure.

In the first place, the interview serves as a shock absorber. It establishes a friendly relation and understanding between the examiner and the applicant. It lends a personal interest atmosphere. The initial contact should be with this purpose in view, to put the applicant at ease so that his test results may not be effected by nervousness. An easy-going conversation about the applicant's past experience, reasons for applying for the job and whatever personal information is required can quickly establish good *rapport* as well as provide material for later filling in the face sheet or application blank.

The Nature of the Interview

Many important items which lead to conclusions as to the possible permanency of the applicant can be tapped during the interview.

The objection might be made that much of this information can be obtained by having the applicant fill out a blank. It is true that the information can be so obtained, but the proper introductory atmosphere for testing cannot be so established. And often much richer results are obtained in conversation about previous experience than in simply an itemized statement.

For many simple jobs, especially of a clerical nature, such an introductory interview is sufficient. The test results are paramount.

As the job becomes more complicated, the value of the interview increases. Especially is this true with jobs which require contact with the public.

There are many tests which attempt to get at "social intelligence." Some of them are helpful and suggestive, but they are indirect methods at best. Often the questions are answered as the applicant believes he is expected to answer them, and they do not represent his actual behavior in the given circumstance. The most direct measure of social ability is an actual social situation. An interview is such a situation. It is essentially the meeting of two personalities with different background and purpose. Its possibilities depend upon the training and the ingenuity of the interviewer.

A few examples may serve to illustrate the difference between testing social reactions through the interview method and through objective standardized tests. We will take the example of selecting a bus operator. The job divides itself into two major parts—ability to operate a bus and ability to deal courteously with the public. The first has been successfully measured by objective tests. For the past five years I have tried to find adequate objective measures for the second. Several of the current tests have been tried, as well as some which I devised myself. I have gone back to the interview method. The reason will be clear after an illustration or two.

Take the question: "What would you do if a lady got on your bus and gave you a counterfeit dime?"

Objective method:

1. Put her off the bus.
2. Say nothing and give it in change to someone else.
3. Call her attention to it and ask for other money.
4. Report her to the police.

This question can be answered by checking anv one of the four statements

The possibilities of behavior are circumscribed. They include only four ways out. Chance operates. Take this same situation in an interview.

Question: What would you do if a lady boarded your bus and gave you a counterfeit dime?

Answer: I would not take it.

Question: What would you say?

Answer: I'd tell her it wasn't no good, and ask her for another one. (Note incorrect English—need for class in Practical English.)

Question: Suppose she was very much surprised when you told her it was no good and looked into her purse to get another one, and that was all she had?

Answer: Well, she'd have to get off.

Question: How would she get home?

Answer: That's not my business, she has to pay or get off. I couldn't let her ride for nothing.

Now why does he make this decision? Is it because he thinks it is what is expected of him, and he wants to make a good impression? Or would he actually put the lady off? Let us push it a little further.

Question: How do you think she would feel toward the company if you put her off a bus because you said her dime was not good?

Answer: Well, I guess she wouldn't like it.

Question: Part of your job is to get along nicely and make friends for the company. Couldn't you think of some other way to handle that situation?

Answer: Well, I could let her ride then.

Question: That isn't allowed. You'd lose your job if you permitted anyone to ride without a fare.

Answer: Well, I guess I could loan her a dime then, and she could pay me back.

The result of this interview shows that the applicant is trainable. He can be made to appreciate good public relations.

Other hypothetical situations bring out other characteristics. Hot temper, willingness to fight, impudence, all of these often creep through unguarded.

**Abstract of paper presented at the convention of the American Psychological Association, held at Columbus, Ohio, Dec. 28, 29 and 30, 1927.*

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In a paper test they might easily be covered up.

The value lies in the elasticity. The questions are constantly shaped to bring out the attitude of the applicant. It is obvious that in order to gain results, the interviewer must be familiar with such psychological process as suggestability, defense mechanism and the like. A background of clinical experience is extremely helpful.

Checking Results

It is quite possible, and indeed often happens, that an applicant may have sufficient ability to pass the objective tests but lacks the proper attitude or personality for the particular job. It is the function of the interview to supplement the test results. Many an applicant has been rejected on the basis of the interview.

But interviews must also lend themselves to verification through follow-up record. It is possible so to record the interview results that follow-up forms may be designed to correlate with them. For example, in the case of public service, such expressions as these might appear on the follow-up record sheet which is sent to be checked by the department head or supervisor:

1. Actively courteous (makes a distinct effort to bring out good public relations).
2. Passively courteous (answers questions courteously, but does not take initiative).
3. Apathetic (has shown little tendency toward courtesy, though not actively discourteous).
4. Actively discourteous (has bad complaints).

In recording the results of the interview, the same phases can be used—and later checked against the follow-up reports. Verification and disagreement serve to guide the interviewer in the future

In the present state of objective selection procedure, we cannot rely entirely on test results. The careful observation of an intelligent and trained interviewer is invaluable in interpreting test results in the light of the particular individual in question, as well as venturing at a prediction of future success.

Group Meetings Stressed in Oklahoma Meeting

GROUP meetings will be stressed in the tenth annual convention of the Oklahoma Utilities Association at the Mayo Hotel, Tulsa, March 13, 14 and 15, according to E. F. McKay, manager of the association and chairman of the convention committee. Seven groups will hold separate meetings during the afternoons, and the general sessions will be held during the mornings. The groups will be the telephone, electric, gas, electric railway, public relations, manufacturers, suppliers and womens' committees. Papers and addresses throwing light on various operating and public relations problems will be presented to each group.

COMING MEETINGS OF *Electric Railway and Allied Associations*

March 6-8 — American Railway Engineering Association, annual convention and exhibit, Chicago, Ill.

March 13-15—Oklahoma Utilities Association, annual convention, Tulsa, Okla.

March 14-15 — Illinois Electric Railway Association, Springfield, Ill.

March 21-22 — Central Electric Traffic Association, Seelbach Hotel, Louisville, Ky.

March 23—Maryland Utilities Association, annual meeting, Emerson Hotel, Baltimore, Md.

March 30—Executive Committee American Electric Railway Association, 292 Madison Avenue, New York, N. Y.

April 26-28—Missouri Association of Public Utilities, Jefferson City, Mo.

May 2-5—Southwestern Public Service Association, Dallas, Texas.

May 6-12—Union Internationale de Tramways, de Chemins de Fer d'Interet Local et de Transports Publics Automobiles, biennial meeting, Rome, Italy.

June 6-8—Canadian Electric Railway Association, annual convention and exhibits, Toronto, Canada.

June 20-27 — American Railway Association, Div. 5—Mechanical (including former activities of the Master Car Builders' Association and the American Railway Master Mechanics' Association), annual convention and exhibit, Atlantic City, N. J.

June 21-22 — American Railway Association, Motor Transport Division, Atlantic City, N. J.

June 28-29—Central Electric Railway Association, Cedar Point, Ohio.

July 8-12—Public Utilities Advertising Association and International Advertising Exposition, Detroit, Mich.

July 25-27—Electric Railway Association of Equipment Men, Southern Properties, Cincinnati, Ohio.

SEPT. 22-28, 1928

American Electric Railway Association, 47tl. annual convention and exhibit, Cleveland, Ohio.

Indiana Utility Association Reorganizing

SINCE Oct. 1 the Indiana Public Utility Association has been in the process of reorganization. The old information bulletins have been stopped and a new information bulletin will be established early in 1928.

During 1928, according to an official bulletin, the Indiana Public Utility Association by its acts and its viewpoint will endeavor to be one of the most active and influential business and industrial associations of Indiana. To this end committees to direct the various activities of the association have been organized and are working. Particularly active since Nov. 1 has been the tax committee. H. S. Morse, of the Indianapolis Water Company, is chairman. The committee already has taken part in the general effort being made in this state to study the taxing situation. Mr. Morse takes a stand for a more scientific taxation system and has pledged the support of the association toward every effort for tax honesty and equity.

Ernest Van Arsdel, president Interstate Public Service Company, has been appointed chairman of the association's advertising committee. C. L. Kirk is now chairman of the association's committee on membership and finance.

American Association News

Electric Railway Finance

NEW car financing was the principle subject of discussion at the organization meeting of the committee on electric railway finance, held at association headquarters in New York on Feb. 24. Those present included the following: Luke C. Bradley, chairman; J. G. Barry, S. M. Curwen, P. W. Winslow, E. A. Tuson, representing Percy S. Young, J. W. Welsh, J. A. Miller, Jr., and Charles Gordon.

The committee devoted its attention to determination of the factors which affect the ability of electric railways to finance new car purchases out of earnings. Chairman Bradley held that the advantages of new cars have been demonstrated on many properties, but that the problem of financing such purchases out of earnings is a difficult one for some properties. Since the restricted credit of electric railways, attributable in many instances to unwieldy financial structures, stands in the way of securing capital for the purchase of new equipment, he felt that acceleration of the industry's recovery is contingent on devising means to make it possible to finance such equipment out of earnings. The experience of properties that have obtained new cars shows that they permit reduction of operating expenses and stimulate improvement of the many factors in railway operation ranging from public and employee relations to volume of riding.

Based upon this preliminary discussion the committee decided to devote its attention to the problem of encouraging the purchase of new cars out of earnings. This program was adopted on the assumption that some properties do not find it practicable to finance new car purchases out of earnings on the present customary terms. It was agreed to undertake the study of several typical properties to determine the basis on which new equipment could be financed and to investigate the possibility of broadening existing facilities for handling equipment trust obligations.

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News of the Industry

Fare Changes Sought in Green Bay

Permission to increase the price of strip tickets to six for 50 cents and to abolish the city ride book with the cash fares remaining the same will be sought by the Wisconsin Public Service Corporation, Green Bay, Wis., from the Wisconsin Railroad Commission. The company now charges a 10-cent cash fare, and sells strip tickets four for 25 cents, and city books containing tickets for $2.50. On the interurban lines zone tickets are sold in 40-ticket books at $3 a book, and permission is asked to increase the price to $4 per zone book of 40 tickets each.

Figures accompanying the petition indicate that the deficit on both the city and interurban line was $279,824 in 1926, and $185,808 from Jan. 1 to Aug. 31, 1927. It is expected the new rates will reduce the deficit to $209,018 or to the rate of $.069 cents per passenger carried.

The company will also request permission to discontinue the fast freight service now offered over the interurban line between Green Bay and Kaukauna, which is being operated at a loss.

Appeal in Denver Case Refused

The United States Circuit Court of Appeals refuses to reopen the case of the city of Denver, Col., vs. the Denver Tramway, the court having ruled that the tramway has a "perpetual franchise" under the grant of 1885-1886. However, the court changes the fare stipulation, agreeing with the lower court that the company is entitled to charge a fare sufficient to net 7½ per cent upon a valuation of $23,514,769. It is said that the city will take the case to the United States Supreme Court, despite the fact that the Supreme Court refused in January, 1927, to take jurisdiction.

Hocker Line Restoration Successful

Service on the Hocker electric line between Kansas City, Mo., and Rose Hill, Kan., will be restored, according to an agreement reached by the Kansas City Public Service Company and the Sonken-Galamba Corporation, which purchased the line for junking.

A reorganized company, known as the Kansas City, Merriam & Shawnee Electric Railway, in which ownership of the line will be vested, will be formed, and $35,000 in bonds reissued to finance the rehabilitation. W. K. Paul, former manager of the line, will be the manager of the new concern. The Kansas Public Service Company will subscribe to $15,000 of the bonds, the Sonken-Galamba Corporation to $16,000, and $4,000 will remain in the treasury of the company. Preferred stock will be issued to patrons of the line who subscribed $10,000. The residents of the vicinity have subscribed more than the $10,000 quota as assigned to them, following a series of meetings in the towns to be served. The money will go to improvements. The special committee representing the citizens and railway officials are working on a plan to sell the bonds. It is said contracts will be let by March 12 and operation of the line started April 1.

The Kansas City Public Service Company will operate the cars on the line, which will serve the citizens of Kansas City, Shawnee, Kan., Merriam, Kan., South Park, and smaller rural communities. It will receive compensation of 4 cents per car-mile and 2 cents a kilowatt-hour for power. Five to 7 miles of the track will be replaced.

A freight connection with the Frisco Railroad is to be sought by the operators of the Hocker electric line. In addition to passenger service from the west limits of Rosedale to Rose Hill, a mile west of Shawnee, the reorganization will operate a freight car over the line.

Jitneys Die Hard in Detroit

More court actions and delays. Review of recent proceedings. Corporation Counsel Wilcox claims jitneys can establish feeder lines

FURTHER delay in ousting the jitneys from Detroit's main traffic arteries was won by counsel for the jitney drivers' associations when Circuit Judge Clyde I. Webster agreed to analyze the validity of the city ordinance against the jitneys. Edward N. Barnard, attorney for the jitney associations, argued that neither the Michigan Supreme Court nor the United States Supreme Court had declared the jitney ordinance valid and contended that the state court had found the measure valid only "as to the objections offered" to it in the case brought before it. Mr. Barnard further contended that the higher court had seen the ordinance was invalid in other respects than the objections brought before it.

The action was taken in a hearing on the motion of the corporation counsel to dissolve the temporary injunction issued in July by Judge Dingeman restraining the city from interfering with the operation of the jitneys. The motion was filed in December in an effort to remove the last legal barrier preventing the enforcement of the ordinance to regulate the jitneys.

The Council later voted unanimously to back Clarence E. Wilcox, corporation counsel, in his decision to carry an appeal to the Supreme Court.

In connection with this matter the corporation counsel's office won another point in the city's fight against the jitneys when the State Supreme Court on Feb. 15 issued an order requiring Judge Webster to defend his injunction of Jan. 31 which restrains the city from enforcing the jitney ordinance. The State Supreme Court granted the city's petition for leave to appeal from Judge Webster's denial of the motion by the city to dismiss the bill of complaint filed by the jitney interests.

In their petitions the corporation counsel and his assistant pointed out that the jitneys are starting on their fifth case, the other four having been decided adversely and one having been carried to the Michigan Supreme Court and to the United States Supreme Court. The corporation counsel contends that further to prevent the public authorities from exercising their legal functions would invade the rights of the people of Detroit, contrary to the public peace, good order and well-being of the community.

The City Council declined to hear an ordinance submitted by counsel for the jitney drivers' associations, intended as a substitute for the existing regulatory ordinance which the city has been seeking to uphold. Corporation Counsel Wilcox, to whom the substitute ordinance was referred, recently advised the Council against rescinding the present ordinance and passing a substitute. Mr. Wilcox feels that the fight is virtually won, and that the Supreme Court will vacate the circuit court injunction, but that if a new ordinance were passed, its validity could be questioned and carried through the same court procedure that followed the city's attempt to enforce the original ordinance.

Under the terms of the present measure the jitneys are not barred from the streets, but the ordinance prevents them from operating on certain main arteries in direct competition with the Department of Street Railways. The Council was informed by Mr. Wilcox that the jitneys, under the present ordinance, could establish feeder routes that are needed in the outskirts of the city.

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Pass Restored in Youngstown

A plan whereby patrons can ride the cars of the Youngstown Municipal Railway, Youngstown, Ohio, for a whole week for $1.50 was put into effect on Feb. 26. No limit is placed on the number of rides, and the pass is good from midnight Saturday till midnight the following Saturday.

In order that the public might thoroughly understand the new weekly-pass plan, the company is giving full particulars through newspaper advertising which will be continued indefinitely.

The restoration of the weekly pass was decided upon when the 10-cent cash fare schedule was recently approved. This schedule calls for 10 cents on both buses and cars, a no transfer charge, six tickets for 50 cents and a weekly pass for $1.50. The City Council recommended an eight weeks' trial of the new fares. The old rates were 8 cents cash, seven tickets for 50 cents with a 1-cent transfer charge.

City Against Sacramento Increase

City Attorney Robert L. Shinn plans to renew his attack on the application of the Pacific Gas & Electric Company to increase the fares on its railway lines in Sacramento, Cal., to 7 cents. The hearing on the proposal is now before the State Railroad Commission. The Central California Traction Company's application for a 7-cent fare on its Colonial Heights line will also be considered. This company, however, is willing to stipulate that it will accept whatever rate is fixed for the Pacific Gas & Electric Company's lines.

Peoria Council Wants Monthly Permit System Restored

The Peoria, Ill., City Council will seek reversal of the Illinois Commerce Commission order which authorizes the Illinois Power & Light Corporation to abolish its monthly permit system, by which passengers were carried on the Peoria city lines for a nickel, and establish a fare of three tokens for a quarter. The 10-cent basic fare remains. The railway was denied the right to establish a 1-cent transfer charge. City authorities claim that about 7,000 50-cent monthly cards are issued during the summer season and 8,000 in winter, with the average holder using the card twice a day 25 days a month.

Modification of Fare Order Sought

The Johnson City Traction Company, Johnson City, Tenn., has petitioned the Tennessee Railroad & Public Utilities Commission for a modification of its order of Jan. 4, 1927, allowing the company to charge a 7-cent fare instead of 5 cents on condition that the extra revenue would be used in the immediate purchase of four one-man cars, and making other improvements to equipment. The company says that two of the cars have been purchased and that other conditions of the order have been partially met, but that the company is without funds to meet its current expenses. It is asking the commission to make it optional with the company as to when additional cars shall be purchased.

President Mahon on State of Employment

Lack of work among electric railway employees throughout the country indicates a generally widespread unemployment among all classes of workers in the view of W. D. Mahon, president of the Amalgamated Association. Mr. Mahon was in Washington for a conference with American Federation of Labor officials on the subject.

The federation has just compiled data showing a sharp increase in the number of union men out of work. Unemployment of the members of trade unions averaged 13.8 per cent in the last three months of 1927. The percentage had increased during the beginning of January to 17.8 per cent and preliminary figures for February indicate an increase even above the January figures.

The percentages of figures of unemployment for those of the 23 cities not already listed are as follows, the periods given being from October to December, 1927, and the month of January, 1928:

Atlanta, 8.7, 9.7; Birmingham, 12.3, 16.6; Boston, 17.8, 19.6; Buffalo, 12.3, 26.7; Cincinnati, 12, 18.6; Cleveland, 16.6, 33.8; Denver, 19.4, 21.3; Detroit, 21, 32.3; Jersey City, 12.4, 21.6; Los Angeles, 16.2, 22.7; Milwaukee, 7.3, 9.8; Minneapolis, 8.1, 11.6; Omaha, 14.7, 26; Philadelphia, 14.3, 30.6; Pittsburgh, 15.1, 17.6; San Antonio, 4, 9; San Francisco, 11.7, 14.3; St. Louis, 9.4, 12.5; Seattle, 10, 11.3; Washington, 9.3, 13.

Mr. Mahon is reported to have said that crews in nearly every city of the country were alternating in voluntary time off, taking a full day in many cities to keep a maximum number employed. A drop in street car traffic, he said, always reflected other unemployment. He cited the recent situation in Detroit when 82 train crews were laid off as a result of the shutdown of the Ford factory.

Rapid Transit Survey Bill in St. Louis

A bill establishing a rapid transit commission for St. Louis, Mo., was presented to the Board of Aldermen on Feb. 24 by Alderman Samuel Wimer, chairman of the special aldermanic committee on rapid transit. The measure calls for an appropriation of $25,000 for survey purposes. The commission would be composed of the Mayor, president of the Board of Public Service, a member of the Board of Aldermen, an engineer and three other citizens.

Baltimore Company Does a Real Service

A big hit has been made with an easy guide to new street names and car lines by the United Railways & Electric Company, Baltimore, Md. Recently the city authorities changed the names of approximately 900 streets, and the public has been more or less confused as a result. The guide issued by the United contains 46 pages and gives the new name of each street, its location, the section of the city, the car line nearest it and the old name. A cross index under the old name also is given.

About 20,000 of the guides were issued by the railway and are being distributed without charge. They are in great demand. The company mailed about 4,000 of the booklets to the individual members of the Baltimore Association of Commerce. As a result hundreds of letters have been received in which the company is praised for its move to help the public. A street car directory issued by the company was referred to in the JOURNAL for Feb. 11, page 254.

Sentence Served, Indianapolis Strike Organizers Leave Jail

Robert B. Armstrong and John M. Parker, who organized the strike in 1926 in Indianapolis, have been released from jail, where they served 90-day sentences for violation of a strike injunction issued by Judge Robert C. Baltzell, federal judge. They expect to be called before the United States Senate judiciary committee at its investigation of the anti-strike injunction issued by the court. The committee decided to call counsel for the Amalgamated Association together with officials of the Indianapolis Street Railway.

Would Extend Subway in Rochester

Extension of the Rochester, N. Y., subway in the bed of the abandoned Erie Canal is already being planned although the line has been in operation less than three months. The City Planning Commission has under consideration the extension of Broad Street, the overhead street now covering the subway in the center of the city from South Avenue to Oak Street. This plan would take the Park-Dewey surface trolley cars off the streets through the congested part of the city by diverting them by a ramp into the subway spur at Chestnut Street. The extension of Broad Street would necessitate razing of many large buildings in the downtown area and would involve great cost.

The subway railroad, built by the city at the cost of $12,000,000 and operated by the New York State Railways under a three-year service-at-cost contract, has not yet been put into full operation on high-speed schedules as proposed, but patronage is exceeding the hopes of the city and railway officials.

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Strike Talk Revived

Correspondence of Mayor Walker to President Hedley of Interborough Indicates Critical Situation

FRANK HEDLEY, president of the Interborough Rapid Transit Company, New York, has reiterated the stand that its contract with the Brotherhood of Interborough Rapid Transit Company Employees makes it impossible for it to employ any members of the Amalgamated or to reinstate 23 members of that union which it has discharged because of that membership.

The letter in which this attitude was rephrased was made public shortly after Patrick J. Connolly, president of the Brotherhood, had announced that that organization would strike if the men dismissed for Amalgamated membership were re-employed. Mr. Connolly's statement follows:

Nine-tenths of the 13,000 employees are loyal members of the Brotherhood and want to be left alone. We are not fighting any outside labor organization but they are apparently fighting with us. We have an agreement with the I. R. T. and we are going to insist that the Interborough live up to this agreement. We ourselves are going to live up to our agreement with the Interborough.

Our agreement with this company requires that the I. R. T. must employ only those who are members of the Brotherhood. We will not tolerate Amalgamated sympathizers in this organization.

We had a meeting this morning and were instructed to see that none of the 23 members discharged be reinstated. We have been running this road since 1916 and we are not striking or tying up any railroads or threatening or causing any trouble.

In his letter to the Mayor Mr. Hedley restated his desire to avoid a strike. It was made in reply to a request from the Mayor that a representative of the company confer with the Mayor in relation to the demand of the Amalgamated organizers that certain Interborough employees who had been expelled from their Brotherhood be restored to their jobs by the company. The request was first submitted to the general officers of the Brotherhood for their consideration. Mr. Hedley said:

The management has been informed by the officers of the Brotherhood that the Brotherhood expects the management to live up to its agreement with the Brotherhood and not to retain in its employ any men who have been expelled from the Brotherhood. The Brotherhood officers request that they have a meeting with you so that their side of the matter may be presented to you. In case you care to arrange such meeting your office will find the Brotherhood officers ready to call upon you at your convenience.

The last thing which this company desires is a strike. No matter what the outcome, it may result in bankruptcy. It certainly will greatly incommode the public even if as perfect order be maintained by the Police Department as was done during the strike of 1926. But as you were advised last summer, the management cannot operate efficiently unless its operating forces are a harmonious body of loyal men.

This company operates the safest railroad in the world. With the exception of small groups of men scattered throughout the various branches of our organization who are affiliated with the Amalgamated Association in violation of their pledges to their Brotherhood and of their promises to the company, we have an efficient, loyal, satisfied and harmonious body of men. They constitute nine-tenths of our 13,000 employees, if not more.

They have repeatedly informed the management that they desire to be let alone by the Amalgamated members and sympathizers. Quarrels and vilification back and forth would be rife if this property were partly Amalgamated and partly Interborough Brotherhood. It must be one or the other in the interest of safe and efficient operation. Therefore the management must stand by its agreement with the great mass of loyal employees and discharge all others when so requested by the Brotherhood and decline to reinstate disloyal employees who have been expelled by their Brotherhood. By standing with more than 90 per cent of our loyal men we would seem to be able to render better service to the public and perhaps as well thereby have a better chance of avoiding bankruptcy.

Your good offices are earnestly requested to persuade the Amalgamated Association to refrain from officially calling a strike and also from taking such action as will result in a so-called outlaw strike where it will be claimed that the men got beyond their control. No body of men will go out on strike without indirect assurances of support from the Amalgamated.

Discussion of Chicago Bills Put Over

Samuel Insull, recently the target of innuendo and intimation in connection with his attempt to bring chaos out of the Chicago transportation muddle, has served notice that first he will withdraw from all effort to bring about a merger of the various properties if attacks upon him continue, and secondly, that the recent request for a higher elevated railroad fare was to render relief to the west side, declaring that whether better service is to be granted that section rests entirely with the politicians.

He covered the two points of just why he is in the railway situation, and why an increase in rapid transit fares has been asked, and summed up his answer in an emphatic and categorical denial that there ever was any "deal" between him and the politicians.

Meanwhile termination of all discussion on the local railway bills has been voted by the sub-committee of the City Council's committee on local transportation until after the primaries on April 10.

Freight Service Contracts for Rochester Subway Signed

Three steam railroads entering Rochester, N. Y., have signed contracts with the New York State Railways whereby the latter will operate freight service over the new municipally built subway railroad in the bed of the abandoned Erie Canal in the city. The latest railroad to sign is the New York Central which handles 80 per cent of Rochester's rail freight, it is estimated. The Buffalo, Rochester & Pittsburgh and the Lehigh Valley previously had signed agreements with the New York State Railways, leaving the Erie and the Pennsylvania the only ones yet to come into the fold.

Installation of the signal system is completed and reballasting of the road bed and straightening of curves remain to be done before the new line can install high-speed service and all interurban lines entering the city can be diverted to the subway.

Strike Averted in Memphis

Although a resolution had been approved looking toward a strike of the employees of the Memphis Street Railway, Memphis, Tenn., on March 1 a strike cancellation order was issued following the naming of W. A. Ransom, Gayoso Umber Company, as third member of the arbitration board. Mayor Overton's assistance was instrumental in deferring this drastic action. He suggested that a new contract be drawn up following the termination of the present one on March 31.

Differences between the company and the employees of the Memphis Street Railway have been widening since early last year when the men set forth their demands for an increase. Under the contract which expired on April 1, 1927, the scale per hour is: first year men, 47½ cents; second year men, 52½ cents, and third year men and older 57½ cents. The company, on the other hand, sought a reduction of 11 cents an hour. Although two arbitrators were selected, namely A. B. Galloway representating the men and F. N. Fisher representing the company, they have been deadlocked over the third.

Nashville Fetes Old-Timers

Old timers of the Nashville Railway & Light Company, Nashville, Tenn., gathered at the Chamber of Commerce Building for their annual banquet on Feb. 1. It was a meeting of the company's Twenty-Year Honor Club which numbers more than 90 men. Eight more employees were scheduled to receive their twenty-year service stripes.

Viaduct Service Resumed in Kansas City

Cars of the Kansas City Public Service Company, Kansas City, Mo., are running through the old Eighth Street tunnel and over the reconstructed elevated road making regular transportation service available again to the central industrial district, where a temporary system has existed since the abandonment of the elevated line six years ago. The resumption of elevated road service saves most of the workers from fifteen minutes to half an hour in getting to work and dispenses with transferring to reach their places of employment. Resumption of service caused the company to discontinue one line—the Minnesota-Argentine line, although it was announced that the route would be virtually duplicated by the new Indiana-Chelsea line. Rerouting was also made necessary.

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Another Fare Hearing in New York on March 5

Federal Judge William Bondy has granted an extension of time to March 5 to attorneys for the city of New York and the Transit Commission to file their reply and briefs to the Interborough Rapid Transit Company in connection with the proceedings under which that company seeks to put a 7-cent fare into effect on its rapid transit lines. This was done by agreement of both sides and also because of the illness of Samuel Untermyer of counsel for the city. This automatically extends the time of the restraining order which will prevent any increase in fare on the Interborough Rapid Transit Company's lines before March 14.

One-Man Cars Make Safety Record in Rochester

On the Rochester, N. Y., lines of the New York State Railways, January accidents in which one-man cars were involved averaged only half of the number in which two-men cars were participants, based on mileage. Leon R. Brown, safety director of the railways, so announced at a meeting at which the safety banner for January was awarded.

The State Street division won the coveted flag with a low average of one accident for every 8,729 miles traveled. This division, of which F. F. Livernash is superintendent, covers more miles than either of its competitors, the Portland and Main divisions.

The monthly competition is part of Director Brown's campaign to reduce street car accidents in Rochester to the minimum and has stimulated much interest among the employees. The meetings at which awards are made are well attended and are addressed by a prominent speaker on some phase of safety work.

Competition Keen in Salt Lake City Safety Contest

Much interest is being displayed by trainmen of the Utah Light & Traction Company, Salt Lake City, Utah, in a safety contest which is now being conducted by that company. Some time ago the seniority list was divided into three teams, which were named the Red, White and Blue teams with a captain over each. The contest runs for alternate periods of 30 days. For example, it was conducted during January, and will be resumed again during March, May, and continued in this manner. At the end of each 30-day period the winning team (the one which has the fewest accidents) is given recognition in some form of entertainment.

A simple set of rules has been placed in effect. Each accident counts one point against the team whose member was involved, the failure of a contestant to report an accident costs his team five points, while a misleading report counts five against the team involved. Each team member wears a button signifying his membership in one of the three teams, and a great deal of intense interest has been developed among the men, with a remarkable degree of friendly rivalry.

The White team won the January contest, with a record of eighteen accidents as against twenty for the Reds and 25 for the Blues. These, of course, include minor accidents, regardless of their degree of seriousness.

It's No Longer Only a Street Car

"THEY never come back" may have its application to prize-fighters and opera singers but certainly not to street cars. They are back on the streets and look better for their period of depression and neglect. Its everybody's business to see the *Nation's Business* for March, 1928, and read what Raymond Willoughby has to say about the new vision of the electric railway industry. "Right Up Front, Please!" is a complete picture of the untiring efforts at solving the operating, manufacturing and employee problems inherent in and incident to the transportation business. The writer had recourse to the analysis of the American Electric Railway Association and to the ELECTRIC RAILWAY JOURNAL for certain data on operating statistics.

Taxi War Hurts Seattle Trolleys

Two proposals are to be laid before the City Council of Seattle, Wash., for eliminating taxicab competition which, with its cut-rate fares, is causing losses to the Municipal Railway. One plan will provide for the operation of taxicab companies on a franchise basis. The other plan will provide for a rigid system of licensing. T. J. L. Kennedy, corporation counsel, has not given an opinion as to what legislation may be enacted. Clark R. Jackson, superintendent of public utilities, said that recent low fares by taxicab companies have cut the number of street car passengers 2,400 a day. Councilman Campbell declared that if competition between taxicab companies continues, they will be operating at rates as low as the old jitneys.

New Tariff in Chicago Suspended

A suspension until July 13 of the new passenger tariff of the Chicago Rapid Transit Company, Chicago, Ill., was ordered on Feb. 21 by the Illinois Commerce Commission. At that time attorneys for the elevated lines may appear before the commission to argue for the elimination of the three tickets for a quarter rate, the $1.25 weekly pass and the establishment of a straight 10-cent fare.

Ambitious Transit Plan for San Fernando Valley

Plans are now being worked out by a committee called together by the combined chambers of commerce of the San Fernando Valley immediately north of Los Angeles, for the construction of a rapid transit railway line between that valley and Los Angeles. According to D. W. Pontius, vice-president of the Pacific Electric System, who spoke to a group of the leading citizens of San Fernando Valley recently, one million are headed toward California, and it is up to the leaders of the San Fernando Valley just how many will settle there. He added that only by building a railway system that would carry people to the heart of the city in fifteen or twenty minutes could a portion of that host be attracted to San Fernando Valley.

At the present time, the San Fernando Valley is served by an interurban line of the Pacific Electric Railway. It is the expectation of this group of the Chamber of Commerce that the service of the valley can be much improved by the construction of a direct line with a more frequent schedule.

G. A. Damon, prominent engineer, once affiliated with Bion J. Arnold, Chicago, said in commenting on the suggestion that the cost of the improvement be levied against property owners who would benefit most by the road:

> As a matter of fact, rapid transit from outlying districts is not popular with many of the suburban communities. Hollywood has no desire for rapid transit and Pasadena is opposed to it. The doubling of land values would work a hardship on many small home owners. Car service to and from Pasadena is improving, the patronage of the Pacific Electric is increasing and I am sure that Pasadena would be unwilling to bond itself for extra service.

Among the advocates of the plan is Charles H. Kline, chairman of the rapid transit committee of the Burbank Chamber of Commerce.

Harbor Belt Line in Los Angeles Planned

A contract for the unification of about $59,000,000 of railway facilities in Los Angeles Harbor has been completed by the Los Angeles officials, representatives of the Harbor Commission of Los Angeles and the Southern Pacific, the Union Pacific, the Atchison and the Pacific Electric Railway Companies. All these properties will participate in the development under which an independent operating unit, to be called the Harbor Belt Line, will be organized. Formal action by the city officials and railways is now awaited. The several railroads concerned in the agreement own tracks running into the harbor and the contract provides for the unification of their operation. It is expected that the Harbor belt line will facilitate the arrival and the passing of shipments to and from shipboard in the harbor.

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Dinner to Brady Prize Winners

Louisville Railway entertains its employees at safety gathering. W. T. Kays gets Connelly Award

MORE than 1,000 employees and their wives attended the first all-carhouse safety dinner at noon on Feb. 20 as guests of the Louisville Railway, Louisville, Ky., in the paint shop at 29th Street and Broadway. The dinner was held to commemorate the outstanding safety record on the company's lines in 1926, which won national recognition by carrying off first honors in the Brady Safety Award Contest.

Employees of the company have a record to be proud of, many speakers declared, as they exhibited the Anthony N. Brady Medal Award from the American Museum of Safety to the Louisville Railway for the greatest achievement in safety and sanitation of any electric railway in the United States in 1926. They pointed to the average of 37,490 miles per accident during the month of January on the company's lines. They warned, however, that an even greater effort on the part of every employee is necessary to maintain the high standard that has been established.

Outstanding public service on the part of an individual employee was rewarded by the company at the dinner, when the Anthony F. Connelly Award was presented to William T. Kays, 38 years old, 2426 West Broadway, a motorman on the Oak Street car line, operating out of the 29th Street and Broadway carhouse.

James P. Barnes, president of the company, presented the award in honor of the late Anthony F. Connelly, who died three years ago after being connected with the company for more than 50 years. The award included the Anthony F. Connelly medal and $75 in gold. Mr. Barnes also announced that Mr. Kays would be a guest of honor of the railway at the American Electric Railway Association convention in Cleveland next September.

Five other employees who received honorable mention in connection with the Connelly Award were Clint Kessler, Fourth and Avery carhouse; Fred Gollar, Shelby Street carhouse; George Bishop, 29th and Broadway carhouse; Charles A. Buren, 25th and Market carhouse, and William Schwindel, 27th and Chestnut carhouse.

Mr. Barnes said it was not believed a few years ago that all of the company's carhouses would ever be represented at the same safety dinner, because it was necessary for each carhouse to have a record of at least 25,000 car-miles per accident in a given month to be eligible for the dinners. Last month was the first month such a record has been attained, he said.

The Chestnut Street carhouse was the only one having a perfect record, as its record of 61,683 miles during January was unmarred by a single accident. The other carhouses' mileage per accident was as follows:

Highland, 67,363; Shelby, 47,523; Market, 41,341; Thirteenth and Main, 37,258; Fourth Avenue, 33,582; Seventh, 33,326; Portland, 31,228, and Broadway, 30,668.

Chartered cars brought motormen, conductors and other employees and their wives to the improvised banquet hall from all sections of the city. Music was furnished by the Louisville male high school band and numerous entertainment features were provided.

A similar meeting on the night of Feb. 20 was attended by more than 1,400 employees and their wives, who were on duty at noon and unable to attend the earlier dinner.

In commenting on the matter editorially the Louisville *Times* of Feb. 21 said under the caption "High Honor":

> Employees of the Louisville Railway are recipients of high honor. Nothing less than good team work, every day, could get for the employees of a city railway the Anthony N. Brady Award from the American Museum of Safety.
>
> The dinner last night commemorating receipt of the award, and calling attention to the January record of more than 30,000 miles per accident directs attention to the spirit and the achievement of the car men. That spirit, and that achievement, should be valued.
>
> By the way, the record pretty flatly contradicts carpers who, here and there, complain that car operators are discourteous and disregardful of patrons. A car operator who disciplines himself in caution is not often one who is without consideration for car patrons.

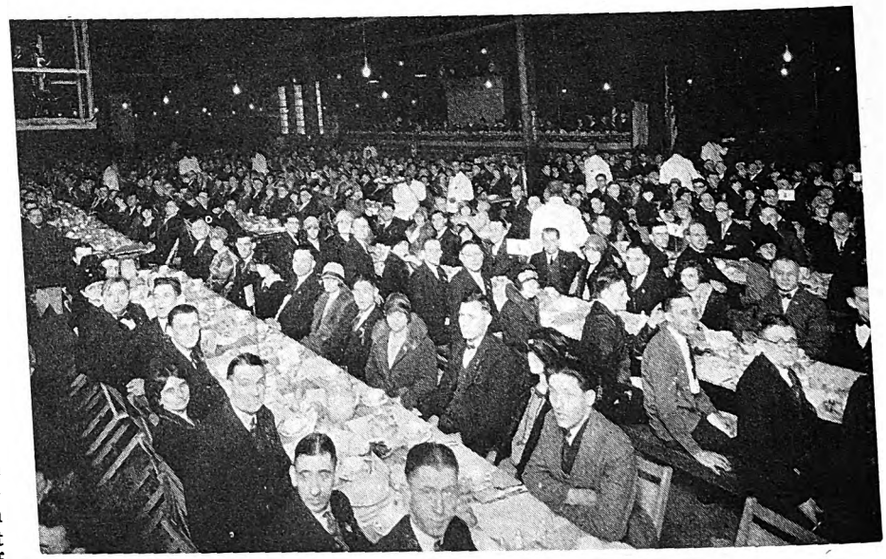
Children Ride St. Louis Cars to See Colonel Lindbergh

Approximately 60,000 school children were carried by the St. Louis Public Service Company from various points in St. Louis to the river front to see Col. Lindbergh and the Spirit of St. Louis perform on Feb. 15. Through arrangements with the St. Louis Board of Education the company provided 350 chartered cars and seven special buses to transport the children. Six buses also were put into service between Fourth Street and the levee to provide accommodations for the little ones. The children came from 99 grade and fifteen high and junior high schools scattered throughout the city.

The schedules provided for the children to reach the river front about 1:30 p.m. while 3:20 p.m. was the time set for their departure. It was necessary to reroute every line touching Broadway or Fourth Street and the arrangement called for the turning back of certain other lines. One hundred supervisors were placed at advantageous points to direct traffic while special emergency trouble crews were placed at convenient spots in case of need. But so efficiently did the traffic department of the company operate that none of the 60,000 children was injured or lost while the chartered cars were taken out of the congested zones in time to avoid the afternoon rush.

The Board of Education paid the customary charge of $14 per street car and $6 an hour for the buses used. Children and their teachers and principals were provided with identification slips in the form of pasteboard street car tags.

All those wearing such tags were permitted to use the cars to return to their schools. Cars also bore signs showing the name of the school served and carried two small American flags as identifying marks.



A representative group of those who serve humanity

Paving Plan in Toledo Awaits Franchise Passage

The Community Traction Company has written the administration at Toledo, Ohio, that it cannot go along with the big paving program unless the plan for the new franchise offered last summer is adopted. This plan would make available more than $1,000,000 in new money and contemplates several new bus routes.

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Offices in Ohio to Move

General offices of the Surburban Light & Power Company, the Surburban Power Company and the General Light & Power Company will be moved from Cleveland to Alliance, Ohio, some time during February, according to E. W. Sweezy, president and general manager of the companies. The suburban Light & Power Company is the holding company for the other two corporations. The companies were recently purchased by New York capitalists who own the Stark Electric Railroad operating between Canton and Alliance. Mr. Sweezy was named head of the concern following the purchase.

New Safety Contest in Youngstown

Operators of Pennsylvania-Ohio Electric Company are in the midst of a new accident prevention contest with every employee of the three railway divisions outside of Youngstown, Ohio, determined to reduce the accident record to a new low level. The conditions are similar to those imposed before except that the year has been divided into four periods of three months instead of six periods of two months. The division with the highest average mileage per accident at the end of each three-months period will celebrate. The division winning the most victories at the close of the year will get a permanent trophy.

Interchange Privilege in Olneyville

An interchange of transfers between the Olneyville-Eddy Street buses and trolley cars in Olneyville has been made effective by the United Electric Railways, Providence, R. I., at the request of the Public Utilities Commission. The company had previously issued transfers only on the Eddy Street end of the bus line.

Strike Continues on Pottsville Lines

The strike on the lines of the East Penn Electric Company, Pottsville, Pa., continues with little prospects of a settlement. Meanwhile buses are being operated in the territory by the individual certificate holders. On Jan. 6 the employees walked out because they were unable to agree with the company on the inclusion of the word "subsidiary" in the new contract. The old contract expired on Dec. 31, 1927. Since the inception of the strike the so-called grievance as regards buses has been abandoned by the men. Now the company insists on certain conditions being eliminated which were in the former contract and is also insisting on the dismissal of a number of men especially objectionable to it. Members of the union appear adamant against receding from their stand that all strikers be returned.

Recent Bus Developments

Another Plan to Solve Tangle in Columbia

Another panacea for the transportation ills in Columbia, S. C., was suggested recently when the City Council adopted a resolution to the effect that bus equipment to the amount of $25,000 or $30,000 be purchased and leased to some responsible concern for an annual sum sufficient to repay the city in approximately three years. This company would be granted exclusive right during this period to operate bus service in Columbia and to control all forms of motor vehicle transportation charging not more than a 10-cent fare. This resolution sets forth that the city intends to hold the Broad River Power Company for whatever loss, if any, may fall upon the city from the putting into effect of such a plan.

Meanwhile, action is pending in the Supreme Court to compel the Broad River Power Company to resume railway operation. Several bus operating concerns have made definite offers to operate systems in Columbia under certain conditions, but so far none of these offers has been accepted.

The General Assembly, now in session, has under consideration a bill introduced by the Richland delegation (Columbia is in Richland County) which authorizes the City Council to control traffic on the city streets. The purpose of this bill apparently is to put the jitney out of business, as the measure provides that the Council may designate on what streets jitneys may run.

Citizens generally are becoming more and more aroused over the transportation situation and it promises to be a main issue in the election for the members of the City Council to be held in April.

Several of the suburbs of Columbia are being served by privately owned buses which make three or four trips each day. Parents of school children are demanding that something be done to enable them to get their children to school without being forced to depend entirely on uncertain jitneys. Since March, 1927, no street cars have been running in Columbia.

Muncie Case to Go Back to District Judge

The United States Circuit Court of Appeals at Chicago has reversed a recent ruling of Judge Robert C. Baltzell of the district court in Indianapolis in the suit of the Equitable Trust Company, New York, trustee, against Sumner W. Denny and other operators of independent bus lines in Muncie, Ind. Attorneys have been advised that the district judge erred in his ruling that he was without jurisdiction to try the suit in which the trust company, as trustee of a mortgage on all the property of the Union Traction Company of Indiana, seeks to prevent the defendants from operating buses in Muncie in competition with the railway lines. The action will result in the case being referred back to the district judge for trial.

Express Bus to Cuyahoga Falls

A new express bus line to Cuyahoga Falls, Ohio, from Akron, was started on Feb. 27 by the Northern Ohio Power & Light Company. The base schedule is half-hour headway from 4:30 a.m. until 8 a.m., then one hour headway until 3 p.m., when the headway again changes to half-hour until 7 p.m., and after 7 p.m. until midnight one-hour service will be maintained. As the riding develops extra tripper service will be fit in during the rush hours when and as required. The purpose of the new operation is to serve a wider territory in Cuyahoga Falls and to relieve the heavy load situation which has developed on the present express bus line.

Houston's Suburb Enjoy Bus Service

Fifteen new Twin Coach buses were put into service on Feb. 1 by the Houston Electric Company, Houston, Tex. These buses serve Harrisburg, one of Houston's suburbs, an industrial center and residential section located on the water front. Prior to this installation of bus service one portion of this section was served by twenty jitneys while the other section was served by a car line. Operation of both the jitneys and car line was stopped with the inception of the bus service. Round-trip mileage on the line is 14.5 miles, minimum headway three minutes and the maximum headway nine minutes.

Regulatory Conference on Buses in Georgia

As soon as it can digest the information secured as to schedules, locations, rates and other features the Public Service Commission of Georgia will call the bus men together for a conference to work out details of supervision, uniform rates and so on. Already the companies must obtain permission from the commission before they can issue bonds or stocks for sale.

Some weeks ago the commission asked all operators of bus lines in Georgia to file reports giving necessary details of their business by Feb. 21. All of the companies complied with the order except the Pierce Bus Lines, Griffin, which questioned the jurisdiction of the commission. However, this company declared that it would comply with the order under protest.

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Detroit Debates Jefferson Avenue Test

Percentage of passengers transferring between bus and car decreases and expenses are much higher

TWO reports on the combined bus and railway service on Jefferson Avenue, Detroit, have been submitted to the Common Council. One was from the Rapid Transit Commission. It is dated Jan. 25. The second is a combined report of the Rapid Transit Commission and the Street Railway Commission. It is dated Feb. 13. The report of the Rapid Transit Commission is accompanied by numerous charts.

Some of the Details

This latter report points out that the Grand River-Jefferson Avenue lines are the only ones of the system affected by the service. The former is 10.7 miles long, the latter 6.37 miles. Prior to the express experiment they were operated as one line with a combined length of 17.07 miles. A partial combined railway express and bus service was begun on the Jefferson Avenue line for a distance of 4.13 miles on Sept. 18, 1927. There were six express stops ranging from 0.52 to 1.22 miles apart. Free transfers were made to and from a local bus service at these stations for the regular fare of 6 cents. On Oct. 1 the operation of through cars at frequent intervals during the rush hours was resumed. During the last part of December the maximum distance of 1.22 miles between express stops was cut to 0.55 and 0.67 miles by the introduction of a new stop.

There was no change in speed on the Grand River line. On the Jefferson Avenue line the former speed of 13.5 m.p.h. between Woodward Avenue and the terminal at Wayburn rose to 14.8 m.p.h. On the express section alone a speed of 17.96 m.p.h. was attained. For the entire distance the passenger would save 3.24 minutes over his former travel time. At intermediate destinations he would save less, and if his journey required transfer to a local bus, he would lose a little time over the former run.

Combined Street Railway and Rapid Transit Report

During the first few weeks of the new service about 50 per cent of the bus passengers transferred to the rail, but this dropped rapidly upon the extension of the local bus service to the business district until it reached 12 per cent in December. Of the rail passengers 93.5 per cent remained on the cars. The gross revenue was fairly uniform, being in July $189,401, November $182,322, and December $195,334. The expenses grew rapidly, however, so that while in July the operating ratio on the combined lines was 82.5 per cent, and in August 83.4 per cent, in October, the first full month of operation under the experiment, it was 96.5 per cent, in November 95 per cent, and in December 97.5 per cent.

The combined report to the Common Council, signed by the presidents of the two commissions, related particularly to a suggested plan to erect a station structure in the center of the street with one or more under-passes to connect the structure with the sidewalk, the whole to be used with a combined electric railway express and local service.

The report points out that such a station would require car loading on the left hand side of the cars, instead of on the right and also a shift of the tracks to curve around the proposed station. Both of these changes would require extensive and costly alterations in existing equipment and track. Referring to the service on Jefferson Avenue the report says, in part:

> Jefferson had the highest average speed of any of our street car lines before the present test, and with the express method of operation will permit speed not attainable on any other line. It is the only street that is 120 ft. wide for several miles, and it has the minimum of cross traffic. Its physical characteristics are most favorable. We should learn all we can about the cost, speed, etc., under those particularly favorable conditions before attempting to determine our future policy.

Statement About Riding Habits

During December, 1927 (after 3½ months of operation), the riding habit on the express street car and local buses was as follows: Using street cars exclusively, 73.3 per cent; transferring from car to bus, 4.3 per cent; using local bus exclusively, 19.4 per cent; transferring from bus to car, 3.0 per cent; total, 100 per cent.

The report declares it is most important to determine whether a bus line can be operated in connection with a railway line upon a 6-cent fare. Further research is thought necessary. The test now being conducted on Jefferson Avenue should be continued for a further period. The proposed transfer station between the tracks is condemned, but a passageway, to be designed and constructed under the direction of the Department of Street Railways, is recommended at Jefferson Avenue at Chene to determine whether pedestrians would use it rather than wait for the green traffic signal and cross on the street surface.

As opposed to these reports the express system of car operation seems to have reduced delays of street traffic. Statements on this point from drivers of automobiles and motor trucks appear on page 358 of this issue.

Bus Substituted on Chattanooga Line

Discontinuance of passenger service on the Red Bank and White Oak lines of the Chattanooga Traction Company, Chattanooga, Tenn., has been authorized by the Tennessee Railroad & Public Utilities Commission. At the same time the company has been permitted to operate a passenger bus line connecting Chattanooga, White Oak and Red Bank. Transfers on the buses will be accepted on any cars of the railway system. The company must continue railway service between Valley Junction and Woodlawn, a distance of less than a mile, Woodlawn being off any highway. Valley Junction is the point where the company's Signal Mountain and Red Bank lines divide.

Would Run Bus Line in Marlboro

The Boston, Worcester & New York Street Railway has made a request of the Marlboro, Mass., City Council for permission to operate a bus line in that city to replace railway service. Action by the City Council was held up until such time as officials explain whether their plan is to discontinue the railway line entirely.

Bill to Permit Bus Extensions in New York

Under the provision of a bill introduced in the Senate by Walter W. Westall, Republican of Westchester County, section 50-a of the public service commission law is amended by authorizing the commission to permit a street railroad or railroad corporation to operate stages, buses or motor vehicles on streets not included in, but forming route connecting with the route of such railroad, provided local consents are obtained. The matter has been referred to the public service committee.

Run South of Indianapolis to be Continued

The Indiana Public Service Commission has ordered the Interstate Public Service Company, Indianapolis, Ind., to continue for a trial period of sixty days the operation of a bus route south of Indianapolis. A loss on the route during the first 60 days of operation was reported by the company.

Replacement on Buffalo Line Under Consideration

Action has been withheld by the Town Board of Cheektowaga on the application of the Buffalo & Williamsville Electric Railway, Buffalo, N. Y., for approval of a franchise to operate bus service through the township as part of the Williamsville-Buffalo interurban line to replace the present single track electric railway along Main Street from Williamsville to the Buffalo city line. The Town Board said it desired additional information regarding rates of fare, local stops and maintenance of road repairs.

Stage Service for California Orange Show

The Pacific Electric Railway, Los Angeles, Cal., has been granted a certificate by the California Railroad Commission to operate an auto passenger stage service between San Bernardino and the Fair Grounds of the National Orange Show during the period each year when that show is open.

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Financial and Corporate

Financial Structure of Lackawanna Line Simplified

The Lackawanna & Wyoming Valley Railroad, Scranton, Pa., recently arranged with a banking group composed of Taylor, Ewart & Company, Inc., Bioren & Company, and Samuel McCreery & Company, for an issue of $4,000,000 in bonds, the money to be used to take over from the Scranton & Wilkes-Barre Traction Company, the holding company, the bonds, mortgages, preferred and common stocks of the company and place them in control of the railroad. The Scranton & Wilkes-Barre Traction Company holds $5,000,000 in bonds of the Lackawanna & Wyoming Valley Railroad. With the elimination of the holding company the Lackawanna & Wyoming Valley will save about $10,000 a year in interest on bonds held by the holding company.

The $4,000,000 is to be obtained through the sale of $2,900,000 first mortgage bonds and of $1,100,000 gold debentures. Upon completion of this financing, the $2,900,000 first mortgage bonds and $1,100,000 debentures will constitute the only funded indebtedness of the company.

The Lackawanna & Wyoming Valley Railroad (Laurel Line), operates by a third-rail double-track railroad of modern construction connecting Scranton, Pittston and Wilkes-Barre. This road, including an extension to Dunmore, is 22 miles in length and has been built entirely on private right-of-way owned by the company with one minor exception. The road is constructed in accordance with standard specifications, permitting an interchange of equipment with the Delaware, Lackawanna & Western Railroad, the Lehigh Valley and the Erie. The company owns the entire capital stock of the Lackawanna & Wyoming Valley Power Company, which generates the power used by the railroad.

Taylor, Ewart & Company, Inc., New York, are offering at 100 and accrued interest to yield 6 per cent $1,100,000 of the twenty-year 6 per cent gold debentures dated Feb. 1, 1928, and due Feb. 1, 1948.

In addition to this offering Taylor, Ewart & Company, Inc., Bioren & Company and Samuel McCreery & Company are selling at 97 and accrued interest to yield more than 5.20 per cent $2,900,000 of the company's 5 per cent first mortgage gold bonds. These bonds are dated July 1, 1913, and are due Aug. 1, 1951.

Stockholders Approve International Railway Changes

At a special meeting of stockholders of the International Railway, Buffalo, N. Y., on Feb. 23 the plan to provide a stronger financial structure for the company was unanimously approved. Of the outstanding stock 96.18 per cent was represented. The plan provides for substitution of no par value common stock for the present $100 par, and issuance of $2,000,000 of 7 per cent cumulative preferred stock. The Public Service Commission has approved the first change, and the company will apply immediately for approval of the proposed issue of preferred stock. Proceeds from the sale of this issue will be used for the substitution of permanent financing for temporary financing, for necessary capital expenditures, and for future similar requirements.

Chicago Rapid Transit Reports

Company operating elevated lines shows slight decrease in gross and net in 1927. Traffic practically constant

OPERATING revenues of the Chicago Rapid Transit Company, Chicago, Ill., for the year 1927 were $20,011,911 and non-operating income was $332,840, making total gross revenues of $20,344,751, compared with $20,420,659 in 1926. The fares collected in 1927 averaged 8.30 cents per passenger, a slight increase over the average for the years 1925 and 1926. These facts were contained in the annual report of the company recently submitted to the stockholders.

Operating expenses (including $323,542 set up for retirement reserve) were $14,189,150. The taxes were $1,767,948. Total operating expenses and taxes were $15,957,099. This compares with $15,797,655 for the previous year.

INCOME STATEMENT OF THE CHICAGO RAPID TRANSIT COMPANY
For the Year Ended Dec. 31, 1927

Gross operating revenues:		
Passenger revenue		$18,778,321
Other transportation revenues		1,233,589
Total		$20,011,911
Operating expenses:		
Maintenance of way and structure	$1,819,075	
Maintenance of car equipment	1,567,760	
Power	2,115,545	
Conducting transportation	7,267,199	
General and miscellaneous	1,419,570	
Total		(a) 14,189,150
Net operating revenues		$5,822,760
Taxes and city compensation		1,767,948
Operating income		$4,054,812
Non-operating income		332,840
Gross income		$4,387,652
Deductions:		
Rentals	$1,074,347	
Interest on mortgage debt and equipment obligations	2,398,332	
Other interest	(b) 29,349	
Amortization of discount	69,526	
Total		3,571,556
Net income for the year 1927		$816,096

Gross income was $4,387,652, a decrease of $235,351 from the previous year.

Interest on funded and other debt, amortization of discount and rentals of leased lines, aggregated $3,571,556, an increase of $66,184. The net income for the year was $816,096, a decrease of $301,535.

Dividends of $464,369 were declared and paid on the company's prior preferred stcok, leaving a balance of $351,726, which was credited to the surplus account.

Corporate surplus as of Dec. 31, 1927, was $2,917,503, compared with $2,514,418 at the close of the previous year.

The number of revenue passengers carried during the year 1927 was 226,212,172, compared with 228,812,766 in 1926. This decrease is accounted for in part by general business conditions and considerable unemployment and in part by the fact that a number of conventions and the Eucharistic Congress brought exceptionally large groups of people into the city during the year 1926.

The traffic statistics show a steady increase for the past six years, with the exception of last year, as follows:

Year	Number of Passengers
1922	181,280,754
1923	203,953,574
1924	212,901,024
1925	216,045,575
1926	228,812,766
1927	226,212,172

Since the issuance of the last annual report, $1,795,000 of first and refunding mortgage 6 per cent gold bonds, due July 1, 1953, were sold to reimburse the treasury for refunding and acquiring underlying lien obligations. Equipment notes and mortgage bonds paid off or acquired during the year aggregated $1,184,000, which includes $238,000 first mortgage 5 per cent bonds of the Northwestern Elevated Railroad purchased pursuant to the terms of the sinking fund. The funded debt outstanding in the hands of the public was increased a net amount of $619,700 during the year. An issue of $1,500,000, 7.2 per cent prior preferred stock, Series "B," was sold during the year at par and the proceeds were used to reimburse the company's treasury for expenditures for improvements, betterments and additions made to its properties. There were 10,932 stockholders at Dec. 31, 1927, an increase of 1,283 during the year.

Inadequate track facilities in the downtown district have for years been a serious handicap, and the efforts of the company have been steadily exerted toward increasing the efficiency of the available tracks through their more intensive use. This has been accompanied by lengthening station platforms and operating longer trains during the rush hours. The company operated 58,102,242 car-miles in 1927, compared with 57,486,898 in 1926. The company plans during the year 1928 to purchase a substantial number of new modern steel cars.

Various operating changes were made during the year to improve the service

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SURPLUS ACCOUNTS		
Balance, surplus Dec. 31, 1926		$2,514,418
Net income for the year ended Dec. 31, 1927 (as above)	$816,096	
Less dividends paid on prior preferred stock	464,369	
Surplus earnings for the year unappropriated		351,726
		$2,866,145
Miscellaneous debits and credits (Net)		51,357
Surplus, Dec. 31, 1927		$2,917,503

Note—(a) Total operating expenses include $323,542.56 credited to Retirement Reserve.
Note—(b) Does not include interest accrued during the year, on Adjustment Debenture Bonds.

and new buildings were completed and placed in service. Some important structural changes were made necessary because of street-widening projects which are being carried on by the city. Total expenditures for additions, betterments and improvements were $1,610,809 and the retirements of property were $300,593, leaving an net addition of $1,310,215 to the capital account for the year. During the year $1,819,075 was expended for maintenance and renewals on the right-of-way and structures and $1,567,760 for maintenance and renewals of car equipment.

According to the report the rates of fare now in force are insufficient to produce a fair return upon the value of the company's property. The present rate schedules have been in effect a little more than five years and their inadequacy has been thoroughly demonstrated. Although the traffic has steadily increased from 203,953,574 in 1923 to 226,212,172 in 1927, the return in 1927 was only about 3.50 per cent. The highest return for any one of the last five years was about 3.85 per cent in 1926. The board of directors has recently decided that proper steps be taken to secure increased revenues from rates, and, accordingly, the company has caused to be filed at Springfield with the Illinois Commerce Commission new rate schedules. Under these schedules all weekly passes and the three-for-a-quarter tickets will be abolished.

Under the group insurance plan for employees, $10,399,260 of life and accident and health insurance was in effect at the end of December, 1927. A total of 5,713 men and women in the service are covered by this insurance. The insurance company paid out during the year $107,320 for sickness and accident claims and $146,825 for death claims, a total of $254,145. Accident and health insurance and $1,000 life insurance were provided at the company's expense as a result of the arbitration of the wage question in 1926.

In furtherance of the company's educational work in accident prevention, 327 demonstrations in first aid were given during the year by trained and uniformed teams of employees, before audiences aggregating 138,300 persons. These demonstrations were given in public schools, at meetings of women's clubs, business men's organizations and fraternal orders. So popular is that feature of the work that there is a constant demand for demonstrations by the first aid teams.

Continuing the program originated in 1926 of instructing trainmen, ticket agents and platform men in correct methods of serving patrons, a total of 207 conferences of employee groups were held throughout the year. More than 2,600 employees attended those conferences and received direct personal instructions on how to answer questions and give correct information to customers. They also received instructions pertaining to neatness of dress, personal appearance, manner of speech and to showing interest in the passenger's comfort.

At the end of the year, there were 5,885 employees in service, of which number 3,541 have been with the company more than five years and 1,998 for more than ten years. The total pay-roll of the company for the year was $10,227,783.

Portland Electric and the Northwestern to Merge

A plan by which the Portland Electric Power Company will acquire by purchase the Northwestern Electric Company, both of Portland, Ore., has been announced by Guy W. Talbot, president of the Northwestern company, and Franklin T. Griffith, president of the Portland Electric, in a statement issued over their joint signatures.

The Portland Electric Power Company owns and operates the entire railway system of Portland as well as some suburban lines.

The Northwestern Electric Company was organized in the days of the former Portland Railway, Light & Power Company, when neither Mr. Talbot nor Mr. Griffith was heading the respective organizations.

Duplicate Lines in Salt Lake to Be Discontinued

Permission to discontinue railway service and remove its tracks on sections of five lines is sought by the Utah Light & Traction Company, Salt Lake City, in an application filed on Feb. 17 with the Public Utilities Commission.

It is pointed out by the application that the lines are being operated at a loss, the gross revenue received from traffic originating on and destined to points on those lines being insufficient to pay the costs of operation and maintenance, without any allowance for depreciation or return on investment. The application also contends that deferred maintenance on those lines amounts to approximately $344,315.

The application shows that each of the lines it seeks to remove is paralleled by other lines and proposes to construct one block of track on Third South between Ninth and Tenth East Streets, and the territory now served by the Second South line beyond Third South and Tenth East Streets will be served by cars routed over Third South from State Street to Tenth East.

Legality of Phoenix Bond Issue Upheld

The State Supreme Court of Arizona decided on Jan. 16 that there is no legal flaw in the $750,000 issue of bonds authorized by taxpayers of Phoenix to finance a modern, efficient railway to be run under city auspices.

As soon as City Manager Rieger learned definitely the import of the court's decision, he telegraphed its substance to Gray, Emory & Vasconcelles, Denver bond dealers heading a syndicate which includes the Harris Trust Company of Chicago and others. In reply, the Denver firm wired that, on receipt of Mr. Rieger's message it had ordered the bonds printed and that the cash would be available as soon as the bonds could be signed and delivered. Since then the bonds have been publicly offered in a 4½ per cent issue at a price to yield 4.2 per cent.

W. A. Ensign has filed a taxpayers suit in the Superior Court by which it is sought to enjoin the city from paying out any money derived from sale of the street railway bonds to Claude Fisher Company under contract recently entered into to reconstruct the railway system. The ground for action is alleged want of power in the city to own or build a railway outside the city limits.

Receivership of Ohio Road to Be Lifted

Prospects are good for the reorganization of the Cincinnati, Lawrenceburg & Aurora Electric Street Railroad, which has been in the hands of a receiver since its business was damaged by the 1913 flood of the Ohio Valley. Charles H. Deppe, vice-president of the Fifth-Third Union Trust Company, Cincinnati, the receiver, is slated to become president under the reorganization and Joseph L. Lackner, of the Queen City law firm of Maxwell & Ramsay, to be secretary. Samuel I. Lipp will continue as vice-president and general counsel. As a move toward lifting the receivership articles of incorporation have been filed for a successor company which will issue 7,500 shares of no par common stock, to be distributed among bondholders of the old company. The Fifth-Third Company, as trustee, recently bought the assets of the old company for the bondholders for $205,000, subject to approval of the Common Pleas Court.

Scioto Valley Company Seeks Reimbursement

Permission to issue $500,000 in notes for a three-year period is sought by the Scioto Valley Railway & Power Company, Columbus, Ohio, in an application filed with the Ohio Public Utilities Commission. The proceeds are to be used to reimburse the company for money spent during the past five years from income for extension and improvement of lines.

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Receiver for Western Washington Properties

Upon hearing of the application of the Old Colony Trust Company, Boston, Mass., which has long been acting as trustee under the indenture securing certain bonded indebtedness of the Puget Sound Electric Railway, Tacoma, Wash., Judge Edward E. Cushman of federal court has appointed Scott Z. Henderson, Tacoma attorney, receiver for the company's properties in western Washington. Bond was fixed at $50,000 with the understanding that if an order is entered directing the property be sold that amount will be raised.

The appointment of a receiver resulted from the filing of a complaint with the court by the Boston company alleging that there was now due and payable to it as trustee under certain mortgages a total of $2,552,505 and that a receiver should be appointed for protection of bondholders.

Mr. Henderson was formerly attorney for the Tacoma Railway & Power Company and Pacific Traction Company, the majority of the outstanding stock of which is owned by the Puget Sound Electric Railway, which owns the Tacoma-Seattle interurban line.

Similar action against the Tacoma Railway & Power Company was forecast at a meeting which was held in New York some few weeks ago, but it is denied by Evans & Ellis, Tacoma attorneys for the plaintiff, that the present action has anything to do with the Tacoma Railway & Power Company.

Decrease in Detroit in January

Auditor Hauser says it is believed seven year record of achievement of municipal railway is unequaled. Progress reviewed since city entered on municipal ownership program in 1921

THE balance of net income reported by the Department of Street Railways at Detroit, Mich., for January, 1928, is $2,977 after the payment of sinking fund charges. The balance of net income for the month of January, 1927, was $57,999, so that January, 1928, shows a decrease as compared with January, 1927, of $55,022.

During January, 1928, 38,520,987 passengers were carried by the rail lines and 3,943,503 by the coach lines, a total of 42,464,490 passengers compared with a total of 42,313,631 carried in January, 1927, divided, 38,935,672 rail lines and 3,377,959 coach lines. In other words, the Department of Street Railways carried 150,859 or 0.36 per cent more passengers in January, 1928, than in January, 1927.

On Feb. 1, 1921, the Department of Street Railways began to function as a transportation agency, so that the general balance sheet statement at the close of business Jan. 31, 1928, may be taken as reflecting the results obtained in seven years of municipal ownership and operation. On this account W. M. Hauser, auditor, took occasion to review the seven years operation. During this time the citizens of Detroit have provided by ballot $41,080,000 for the purchase, construction and improvement of the property. This debt has been reduced until now as of Jan. 31, 1928, it amounts to $27,304,343. The difference between this amount and the amount provided by the people is $13,775,656, which represents the city's equity in the property, paid entirely from revenues. Of this thirteen odd million dollars $6,535,000 has actually been paid off and there is on hand in sinking funds $7,240,656 to meet the requirements of the debt obligations as they fall due.

On Jan. 31, 1928, other long term debt existed to the amount of $3,318,296, the action creating this debt having been approved by the Board of Street Railway Commissioners and the Common Council. The debt incurred remaining unpaid at Jan. 31, 1928, was for purposes as shown below:

New Rail line extensions	$882,648
125 new street cars	2,034,000
41 coaches	136,647
Property for carhouses, etc.	265,000
Together	$3,318,296

In order to provide service for the fast growing city it was necessary to finance these extensions in the manner adopted, as no bonds were available for the use of the department.

The accrued depreciation (road and equipment) at Jan. 31, 1928, as shown by the balance sheet, amounts to $4,772,153 equal to 9.4 per cent of the $50,549,472 of the cost of road and equipment. Mr. Hauser says that "this, it is believed, compares favorably with any city transportation system in the country."

Since the Department of Street Railways has been criticised with respect to the subject of depreciation, Mr. Hauser made the following statement to help clarify the situation:

Private corporations as a rule issue capital stock and bonds to secure money with which to acquire their property. It is not their intention to purchase back this capital stock or retire the bonds out of earnings of the property, but only to pay dividends on the capital stock and interest on the bonds, i.e., pay interest on the money received—provided such dividends and interest are earned, but that is another story. As such capital stock and bonds are never to be retired out of earnings, some way must be devised to replace the property when it is worn out. Accordingly, an account is opened up called "accrued depreciation" to which annual installments are transferred from earnings in an amount sufficient to equal the cost of the property by the end of the period of years that it is estimated it will last in operating condition. For purposes of discussion, it is immaterial whether such an ideal condition is exactly realized or not.

Municipal corporations do not issue capital stock but they issue bonds instead. Probably the law provides no other way for them to finance the construction or purchase of their public utility properties. It is the intention where such bonds are issued to redeem them at maturity, i.e., to buy them back. Accordingly, a fund is set up called a "sinking fund" to which annual installments are transferred from earnings in an amount sufficient to equal the cost of the property by the end of the period of years that it is estimated the property will last in operating condition. Some cities have not been careful about the length of the term of their bonds, but in all cases the term of the bonds issued should coincide with the life of the property purchased by such bonds, or having a less life, so that the transaction may be conservative. It is apparent therefore that at the time when the property is worn out the bonds will be paid and the city will have neither property nor debt. Should the citizens wish to continue the property in the future, property can be bought with a new issue of bonds to be paid as before.

In conclusion Mr. Hauser says that failure to distinguish between private finance and public finance has led many to make statements that becloud the issue. According to him it is impossible to pay for two plants at the same time and that is, in effect, what is being done when depreciation and sinking funds are both established. He says:

This is practically impossible and would not be right if it were possible. It is impossible first because to pay for one plant and to lay aside funds to purchase another would call for an excessive rate of fare, and for the present generation to provide for future properties to be used by the following generation is wrong in principle because it is making one generation pay for the next generation's needs. Notwithstanding this, however, the Department of Street Railways with its existing rate of fare has been enabled, in addition to paying off $13,775,656 of debt, to set up accrued depreciation in the amount of $4,772,153. The amount represented by this accrued depreciation has been earned and has been invested in property, a proper procedure. Not one cent of any of this money has been contributed by the taxpayer. It has all come from the car riders.

In other words, as Mr. Hauser puts it, the Department of Street Railways, during the period from Feb. 1, 1921, to Jan. 31, 1928, the past seven years, has:

1. Paid all operating and maintenance expenses, including paving between tracks.
2. Taxes on the physical property of the entire street car system, the same as if privately owned.
3. All interest charges on the debt outstanding against the property.
4. All sinking fund requirements as required by the City Charter.

Nebraska Company Retired from Railway Field

The Nebraska Railway Commission has authorized the Bethany Traction Company, a subsidiary of the Lincoln Traction Company, to remove all of its trackage from 49th and Holdrege Streets to a point on Hiram Street, Bethany. This will end the corporate life of the company, as it is without ownership of any property now. The suburb of Bethany is served by buses operated by the Lincoln company elsewhere in the city.

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Changes in Capital Structure of Nova Scotia Company

The Nova Scotia Tramways & Power Company, Halifax, N. S., is to change its name to the Nova Scotia Light & Power Company and to effect a capital reconstruction which will affect all the present outstanding security issues and place the company in a financial position with capitalization more in line with earning power.

A total of $3,682,500 in first mortgage and in general mortgage bonds is now outstanding. Both these issues will be called and will be replaced by a new 5 per cent first mortgage issue. The redemption of the present issues will involve an annual saving in fixed charges, for the general mortgage bonds now bear interest at 7 per cent. Ranking junior to the bonds, the new company will create an issue of 25,000 new 6 per cent cumulative preference shares of $100 par value. Doubtless, some of this stock will be sold to keep the company in a sound working capital position. The new company will have 40,000 common shares of no par value, of which 2,510 will be issued to the holders of the present common shares on the basis of one new share for every ten shares of the present stock. In addition to this, 32,013 shares will be issued to the holders of the present preferred shares of the company on the basis of 1.54 new shares for each preference share. In this fashion, the company will liquidate its arrears of preferred dividends.

As soon as the shareholders of the company have authorized the change in the name of the company and the capital reconstruction, a bill to carry out the plan will be introduced at the present session of the Nova Scotia Legislature. The Nova Scotia Tramways bonds will not be redeemed until June 1 at the earliest.

The company has just experienced the best year in its history. For the year just concluded, the company's deficit account was reduced from $204,023 to $174,476. The results of operations over the past three years follow:

	1927	1926	1925
Gross	$1,491,608	$1,438,903	$1,344,099
Operating expenses	933,902	1,003,765	959,371
Net	$557,706	$435,138	$384,728
Interest	214,976	216,214	216,926
Taxes	120,355	16,520	16,526
For reserves, etc.	$222,375	$202,404	$151,276

Milford-Uxbridge Property Sold

The Supreme Court has authorized Walter Adams, receiver of the Milford-Uxbridge Street Railway, Milford, Mass., to sell the property to the Citron-Beyer Company, Trenton, N. J., for $86,200.

Bids for the property, which was ordered sold at public auction on Feb. 24, were opened by Judge Wait. The only other bid was made by a New York company. It was for $83,625. After the bids had been opened and read the New York people raised their bid to $86,500. This figure was not considered.

Judge Wait said that the sale had been ordered for the best interests of the people of Milford and Uxbridge, and for the railway itself. It was stated after the sale that the new owners would replace the railway with buses.

The railway was organized 32 years ago as the Milford, Holliston & Framingham Street Railway. Since 1902 the name Milford & Uxbridge Street Railway has been used. The Milford & Uxbridge Company has operated cars from Milford to Framingham through Holliston; from Milford to Uxbridge, through Mendon and Hopedale; from Milford to Medway and from Milford to North Grafton by way of Hopedale, Upton, West Upton and Grafton.

The company operates its cars over the latter line over the rails of the Grafton & Upton Railroad, electrified between Hopedale and North Grafton, the railroad company owning the poles, roadbed and other equipment. Until a year ago the Milford & Uxbridge Company also operated between Milford and Hopkinton. This service was discontinued owing to lack of patronage.

Hartford-Springfield Route Sold

The New England Transportation Company has purchased the Hartford-Springfield Coach Company for a price reported to be $250,000 with the purchaser to assume all the outstanding obligations of the Hartford-Springfield line. The line was purchased to perfect the interstate operation of the New England system. The coach company operates between Hartford, Conn., and Springfield, Mass., over the route of the old Hartford & Springfield Street Railway, of which it is the successor.

Seattle Meets Its Purchase Payment

As a result of financial aid from the light department, city officials of Seattle, Wash., were enabled to telegraph to the city's fiscal agent in New York the annual payment due on March 1 on the Municipal Railway purchase bands. The sum, $1,252,510, included $833,000 on the principal and $250,050 in semi-annual interest. The rest of the amount transmitted will go toward retiring other bonds and meeting interests. This leaves $6,161,000 yet to be paid on the $15,000,000 purchase price agreed upon when the city bought the railway system from the Puget Sound Power & Light Company.

The difficulties encountered in meeting this year's payment were sidestepped, temporarily, at least, when the City Council negotiated a loan of $550,000 from the light department to the railway department to enable the railway to meet its payroll and other operation costs while all the revenues were put aside to make up the March 1 installment. The railway is paying 4 per cent interest on the loan. Of a similar loan made last year, $100,000 remains to be repaid.

Dividend on Denver Preferred Cut

The Denver Tramway, Denver, Col., has declared a dividend of 75 cents a share on the preferred stock, payable on April 1 to stockholders of record March 15. This stock is cumulative at the rate of $1.25 a share quarterly. Since the company paid only 75 cents for the two last quarters it is now $1 in arrears on the issue.

Testimony Concluded in St. Louis

Taking of testimony on the valuation of the St. Louis Public Service Company, St. Louis, Mo., was concluded by the Missouri Public Service Commission on Feb. 18. The final witness was M. H. Doyle, chief engineer of C. E. Smith Engineering Company, consulting engineers for the city of St. Louis. His set-up of the investment cost of the railway as of Jan. 1, 1927, used in operation was $47,375,948, to which he added $2,091,833 of non-operating property, giving a total investment of $49,467,781.

The company at former hearings on its application produced evidence to show a reproduction valuation of $100,000,000 and contended for a rate-base valuation of $75,000,000. The temporary value fixed by the commission was $52,000,000.

Net Earnings of Stark Electric Doubled

By manufacturing power part of the year, and cutting costs by the more extensive and intensive use of one-man cars, the Stark Electric Railroad, Alliance, Ohio, shows a net income for 1927 of $113,402 compared with $53,309 for 1926. This is in face of a $1,600 reduction in gross income.

Where in the past the power bill was approximately $180,000, the Stark Electric estimates the 1927 cost at $100,000. The company's plant was operated during most of the year.

Statistics covering the railroad, with the Alliance Power Company, a subsidiary, follow:

	1927	1926
Gross earnings	$459,238	$460,865
Operating expenses and taxes	345,836	407,826
Net income	$113,402	$53,039

Interborough Balance $1,401,578

For the seven-month period ended Jan. 31, 1928, the gross revenue from all sources of the Interborough Rapid Transit Company, New York, N. Y., was $38,656,001 representing an increase of $2,845,816 over a similar period of the previous year. Total operating and maintaining expenditures were $22,592,337 an increase of $1,108,236. The balance after interest and rentals and which is subject to Transit Commission readjustment was $1,401,578 or an increase of $1,656,493 for the seven months' period ended Jan. 31, 1927.

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Legal Notes

FLORIDA.—*A "Jitney Bus" Is a Common Carrier and Therefore Subject to Appropriate Governmental Regulation.*

The ordinary use of the city streets by a citizen in travel and the prosecution of his business is an inherent right which cannot be taken away by the city and may be controlled only by reasonable regulation. But the right to use the streets for conducting thereon a private business is not inherent or vested. It can be acquired only by permission or license from the city. Where a state had delegated to a city power to license and regulate traffic on its streets, a city ordinance prohibiting the grant of permits for operation of motor buses in congested districts is a valid exercise of the city's police power. [State vs. Quigg, 114 So., 859.]

LOUISIANA — *Municipality Operating Railroad Does So on the Same Basis as Railway Corporation.*

The municipality of Monroe, La., which operates a street railway, passed an ordinance requiring a steam railroad passing through the city to construct over its track certain overhead crossings to be used by the municipal street railway. It was held that the municipal railway was a private undertaking operated for private gain and the position of the city in this case was like that of a private corporation engaged in the same business, and not of a governmental agency. Hence, its ordinance was invalid and it must pay for the construction of the crossings used at its own expense. [Vicksburg S.&P. Railway vs. City of Monroe, 115 So., 136.]

MASSACHUSETTS—*Responsibility of Subway Company for Maintenance of Station Approach.*

A subway passenger fell over a block on the sidewalk surrounding a subway station. The block was 18 in. high and once had been the base of a traffic sign belonging to the city of Boston. It had been in the same location for at least five months. In the lease of the subway from the city to the operating company, the latter agreed to keep in good condition the "entrances, approaches, stations, etc.," of the subway and was held responsible for the accident. [Smith vs. Boston E.R. Co., 159 N.E., 501.]

MINNESOTA. — *Status of Fireman Riding to Fire on Fire Truck.*

A fireman riding to a fire on a fire truck was injured in a collision with a street car. Negligence was charged against both the motorman and the truck driver. The court held that the fireman injured was not engaged in a "joint enterprise" with the truck driver. To constitute "joint enterprise" two or more persons must unite in joint prosecution of a common purpose under such circumstances that each has authority, expressed or implied, to act for all in respect to the conduct or the means or agencies employed to execute such common purpose. [Ring vs. Minneapolis S.R. Co., 217 N.W., 130.]

MISSOURI — *When Passenger Status Begins at a Stopping Point.*

Where a person, following directly behind others who had boarded a bus with the knowledge and assistance of the conductor, had set his foot upon the rear platform with the intention of securing passage therein, he became a "passenger," irrespective of where the regular or customary stopping place for the bus may have been. [Hayward vs. Peoples Motor Bus Co. of St. Louis, 1 S.W. (2d), 254.]

NEW HAMPSHIRE—*Settlement with One of Two Defendants in Claim in Negligence Case.*

A suit for damages was brought against both an automobile driver and street railway alleging negligence, but settlement was made by the automobile driver before the trial. It was held this did not prejudice the claim of the plaintiff against the railway company, though the sum received from the driver should be deducted from the amount of judgment against the railway company. [Masterson vs. Berlin Street Railway, 139 A., 753.]

NEW JERSEY—*Requirements for Franchise Grant Must Be Fulfilled.*

The general ordinances of a city provided that before licenses for motor buses should be granted, applicants must give certain information in writing and then that the application should be acted upon within 30 days. As these requirements were not fulfilled, the court declared that a license granted by the city to a motor bus company was invalid. [P.S. Ry., vs. Hackensack I.C., et al., 139 A., 797.]

NEW JERSEY — *Bus Operating Without Authority Is Not Released From Franchise Tax.*

A state act provides that motor buses operating in or through municipalities of the state shall pay 5 per cent of their receipts monthly to the various municipalities, in proportion to the length of route in each. A bus company which had been operating for a long time in the town of Guttenberg without a permit declined to pay this tax because the town had not officially granted its consent to operation. But as the town had not objected to the operation of the bus, the court held the tax must be paid. [Guttenberg vs. Benjamin, 139A, 823.]

OHIO—*Liability for Baggage of Bus Passenger.*

A bus passenger attempted to take a hand bag into the vehicle, but an official of the bus company insisted upon taking charge of it, stating that it would be returned to the passenger at the end of the trip. It contained among other things a lady's wrist watch and clothing intended for presents to the passenger's family. At the end of the trip the bag could not be found. The court held that the urgency of the agent of the carrier to take the baggage made the circumstances differ from those where baggage is carried on a check system at the request of the passenger, and that he could collect within reasonable limits both for his own clothing and for articles intended for members of his family, like those specified. A judgment for $116.25 was upheld. [Cleveland-Akron Bus Co. vs. Rogoff, 159 N.E., 374.]

TENNESSEE—*Mother Not Entitled to Recover from Fright and Shock when Minor Son Is Injured.*

A mother witnessed an accident in which her minor son was seriously injured by a street car. It was held she could not recover for injuries resulting to herself from fright and shock at such a time. [Nuckles vs. Tennessee Electric Power Co., 209 S.W., 775.]

TEXAS—*Seat Fee For Buses Upheld.*

The Court of Civil Appeals of Texas upheld Article 820 of the Penal Code, which provides that owners of passenger motor vehicles operating for hire, in addition to the regular license fee, based on the horsepower and weight of the vehicle, must pay an additional registration fee of $4 a year for each passenger such a vehicle will seat. [Lowery vs. English et al., 299 S.W., 478.]

WASHINGTON — *Special Precautions Should Be Used When Operating Contrary to Direction of Traffic.*

A railway company had tracks on both sides of the street, but used only one for both directions of operation. In a case of this kind, a car motorman should exercise especial precaution when operating contrary to the traffic on his side of the street, as a stranger might assume that cars on tracks on the right-hand side of the road would be proceeding in the same direction as himself. [Kitchen vs. Tacoma R.&P. Co., 262 P., 961.]

WISCONSIN—*Precautions Necessary in Inspection of Tires.*

While a bus was traveling at the rate of 4 to 5 m.p.h., a tire blew out with such force that it punctured the housing and caused injury to a passenger sitting above the wheel. Prior to starting a representative of a tire company had inspected the tires in the manner regularly followed, namely, by feeling them from the outside. The bus company was held to have exercised ordinary care, absolving it from negligence in the injury to the passenger. [Ormond vs. Wisconsin P. & L. Co., 216 N.W., 489.]

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Personal Items

F. A. Healy Honored

F. A. Healy, auditor and treasurer of the Indiana, Columbus & Eastern Traction Company, Springfield, Ohio, was elected president of the Central Electric Railway Accountants Association, at the recent meeting in Cincinnati. Mr. Healy has been in electric railway work since 1906 and was instrumental in developing the Ohio Electric Railway at Springfield into one of the most extensive interurban systems in the Middle West. With the segregation of the Ohio Electric System properties in 1921, Mr. Healy became secretary-treasurer of the Indiana, Columbus & Eastern Traction Company as well as its leased lines, and for a few months following the retirement of J. H. McClure as active receiver, he took over the work of general manager in addition to his other duties.

At the age of nineteen Mr. Healy was working in the office of the Atchison, Topeka & Sante Fé Railroad. From then he served many steam railroad properties including the Southern California Railway, the Sante Fé, Prescott & Phoenix Railway, the South Carolina & Georgia Railroad, the Augusta Southern Railway, the Ohio River & Charleston Railroad and the Lake Champlain & Ogdensburg Railroad, the Atlanta & West Point Railroad and the Western Railway of Alabama. From the steam railroad field Mr. Healy then went into electric railroading. He helped to form the Central Electric Railway Accountants Association in 1907 when systematic electric railway accounting was in its infancy. Mr. Healy was born in 1861 at Moline, Ill.

W. O. Wood With Cable Company

William O. Wood, well known in the public utility field and particularly for his work with the New York & Queens County Railway, was recently elected vice-president of the Waterbury Cable Service, Inc., of New York and Chicago.

For many years Mr. Wood was identified with railroads and electric railways in New York, the Middle West and the South. Following his service with the Louisville and Nashville and the Illinois Central Railroad he entered the electric railway field as general superintendent of the Rapid Railway System, comprising the interurban lines of the Detroit United Railway, Detroit, Mich. Subsequently he was superintendent of the rapid transit lines in Brooklyn and later assistant general superintendent with charge of transportation in Brooklyn. For one year he was operating statistician of the Interborough-Metropolitan Company, New York.

Mr. Wood's most recent electric railway connection was as president and general manager of the New York & Queens County Railway and vice-president and general manager of the New York & Long Island Traction Company and Long Island Electric Railway. These activities covered a period of fifteen years. His headquarters will be at 342 Madison Avenue, New York.

Wadsworth Winslow Advanced with Hemphill & Wells

Although less than three years have passed since Wadsworth Winslow became affiliated with the Interstate Street Railway at Attleboro, Mass., he has ably demonstrated his ability to take over the position of general manager. This appointment became effective on March 1. Mr. Winslow served as assistant treasurer and secretary of this Hemphill & Wells property from Oct. 1, 1925, to Nov. 1, 1926, when he became assistant general manager.

Wadsworth Winslow

His early experiences were varied and valuable. For eighteen years he was employed by Stone & Webster covering the period from 1907 to 1925. With the Blue Hill Street Railway of Canton, Mass., he received his training in practical railway work, including accounting, car shop practice and service as conductor and motorman. He was engaged in these capacities at Canton for about two years. From this work he went to the Chase-Shawmut Company, electrical supplies manufacturers at Newburyport, Mass., as accountant. His next connection, covering three years, was with the Cell Drier Machine Company, Taunton, Mass., as assistant treasurer. Later he became auditor of the Chicago, Wilmington & Franklin Coal Company, Chicago. All these properties were under Stone & Webster management, which he left in 1925 to join Hemphill & Wells in New York.

Mr. Winslow was born in Quincy, Mass., on Sept. 2, 1888. He was educated in the Quincy grammar school and at the Canton high school. His education also included special courses in accounting in the Walton School of Commerce, Chicago.

J. D. Alexander and Guy McDougal Advanced in Fairmont

John D. Alexander, for the last seven years purchasing agent of the Monongahela West Penn Public Service Company, Fairmont, W. Va., became manager of transportation on March 1, succeeding R. W. Spofford, who resigned on Jan. 1.

Mr. Alexander has had considerable construction and mining engineering experience. He went to West Virginia first in 1916 with the Sanderson & Porter organization in charge of the reflooring and reconstruction of the Marietta-Williamstown bridge. Later he was the engineer in charge of construction of the Monongahela system power house at Parkersburg and engineer on the construction of the Boaz Bridge between Parkersburg and Williamstown. While working as engineer on the construction of the big power plant at Rivesville, he resigned to join the army and spent ten months overseas in a machine gun battalion.

Following the war he returned to the Rivesville plant with Sanderson & Porter until the construction work there was completed and then he spent some time in Oklahoma as superintendent of pipe line construction. Later he was employed by the Monongahela West Penn Public Service Company to supervise the construction of the additional unit to the Rivesville plant and since that time has been head of the purchasing department.

Mr. Alexander is a native of Alabama and a graduate of the Alabama Polytechnic Institute. He is one of five Alexanders in the employ of the local company, who are, so far as known, not related.

Guy McDougal, who for a number of years has been assistant manager of the purchasing department, becomes acting manager.

H. H. Cloyd and D. B. Eyer Promoted at Kansas City

Hardy H. Cloyd has been appointed analysis engineer reporting to the comptroller of the Kansas City Public Service Company, Kansas City, Mo. Donald B. Eyer will have charge of the work in vice-president Buffe's office formerly handled by Mr. Cloyd.

Mr. Cloyd entered utility service in Kansas City in March, 1917, as statistical clerk at the Missouri River power station. Later he was transferred as assistant superintendent of power and equipment. In 1924 he moved to the general office as assistant to the general manager, which title was later changed to assistant to vice-president in charge of operations.

Mr. Eyer went to Kansas City from the General Electric Company in 1924 as electrolysis engineer. He was later made electrical engineer in the office of the general superintendent of maintenance. He was graduated from Kansas University.

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Manufactures and the Markets

$787,300 for Railway Work in Atlanta

The 1928 budget for the railway department of the Georgia Power Company, Atlanta, Ga., calls for $787,300. This budget does not contemplate any new cars for this year. Of the total $360,000 is for miscellaneous track improvements, $150,000 for new special work and track to enable the company to use the two new viaducts at Central Avenue and Pryor Street now being constructed by the city, $40,000 for miscellaneous improvements, buildings, grounds, etc.

The mechanical department gets $237,300 as a total amount. Of this, $121,000 is for equipment trust payments, $74,192 for remodeling and miscellaneous improvements to cars, and $44,110 for miscellaneous tools and improvements to car shops and carhouses.

The mechanical department expects to change over 40 two-man cars for one-man operation during this year. The cost of changing over twenty of the cars is included in the 1928 budget, and the cost of changing the other twenty is a carry over item from the 1927 budget.

Case Involving Patents Referred Back to Lower Court

A decision by the United States Circuit Court of Appeals has been made in reviewing the findings of the U. S. District Court in the case of Goldschmit Thermit Company vs. Alumino-Thermic Corporation, Hugh G. Spilsbury and Henry J. Barnes. The review of the findings of the lower court was made on appeal by the Alumino-Thermic Corporation.

The Appellate Court modified the decision of the lower court to the extent of finding that Goldschmit patent No. 900366 covering preheating, which expired during the litigation in this case, was invalid. The court found the so-called insert patent of the Goldschmit company valid and infringed. It stated further that the method of undercutting rails for welding is not an infringement of this patent. Goldschmit Patent No. 1075709 covering the manufacture of ferroso-ferric oxide and its use in the manufacture of alumino-thermic mixtures was held valid and infringed.

The case has been referred back to the lower court for modification of its decree.

Stone & Webster, Inc., Open Office in Paris

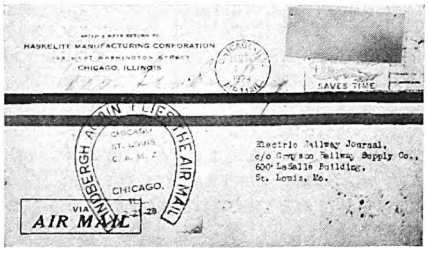
Stone & Webster, Inc., Boston, Mass., announces the opening of a Paris office at 2 Rue des Italiens. The firm has reported on many large foreign projects recently financed, including the Adriatic Electric Company, the Lombard Electric Company and the Italian Public Utility Credit Institute.

Through the Paris office, investigations, valuations and reports on public utilities, industrial plants and government and municipal loan projects will be handled for bankers and investors.

James F. Case will be in charge of the new office.

Haskelite Sends Lindbergh Air Mail Letters

An air mail letter carried by Lindbergh was the history-making treat sent by the Haskelite Manufacturing Corporation to all of its customers and prospects in St. Louis, Mo., on Feb. 21 when the colonel operated the Chicago-St. Louis air mail line.



To *Electric Railway Journal* via Lindburgh air mail

As a letter could not be sent direct to Electric Railway Journal in New York, the Haskelite Corporation sent a copy to its railway representative in St. Louis, as illustrated, which was forwarded to New York.

The letter carried a special head and was printed on a light grade of paper permitting it to come under the 10-cent half-ounce rate. The contents of the letter boosted the use of air mail and advised that the plywood used in the "Spirit of St. Louis" is Haskelite.

Some Recent Twin Coach Deliveries

Twin Coach Corporation, Kent, Ohio, reports delivery of twin coaches in January to the following electric railway properties:

Virginia Electric Power Company, Norfolk, Va., ten mechanical drive urban type; Northern Ohio Power & Light Company, Akron, Ohio, one mechanical drive parlor coach; Pacific Electric Railway, Los Angeles, Cal., one urban type; Los Angeles Railway, Los Angele, Cal., one urban type; Portland Electric Power Company, Portland, Ore., two mechanical drive urban coaches. Eight twin coaches with electrical equipment for operation as trackless trolleys were shipped to the Manila Electric Company, Manila, P. I. One of these coaches was completely assembled while the other seven were shipped "knocked down."

Expense of New Truck and Taxi Lines Affect Yellow's Earnings

If extraordinary charges of $561,604 are eliminated, operations of Yellow Truck & Coach Manufacturing Company, Chicago, for 1927 show a slight profit. Militating against the company financially was the expense incidental to bringing out new lines of trucks and taxis. According to the report, the year 1927 was one primarily of readjustment. The company hopes, however, to realize shortly many economies as a result of the concentration of operations in a modern plant and should also benefit by the improvements in and additions to its line of products.

Paul W. Seiler, president of the company, speaking of the 1927 operations, said:

Poor showing in 1927 resulted primarily from losses of an extraordinary character as well as additional expense incidental to bringing out complete new lines of trucks and taxicabs. Eliminating these extraordinary charges, operations for the year would have shown a slight profit. It has become more and more apparent that reconstruction of the manufacturing property was essential. Recently, it has been made manifest that severe writeoffs of asset values were necessary in connection with the obsolescense of products no longer in current production, developing the new line of products and compensating manufacturing operations in a new plant at Pontiac, Mich. Further losses have been suffered in respect to accounts receivable. Writeoffs established in 1927 on account of the above have amounted to $5,641,605.

Total surplus of the company at the beginning of the year stood at $8,073,770. As of Dec. 31, 1927, surplus has been reduced to $165,078. In view of the small available surplus and probable further operating losses during the early months of 1928 there appeared no alternative but to suspend dividend distribution until the operation condition of the company becomes more assured.

The report shows net loss of $6,858,691 after expenses, depreciation, and special adjustment charges of $5,641,604. This compares with net income after expenses, depreciation and federal taxes, of $1,125,922, equal to $7.50 a share on $15,000,000 7 per cent preferred stock in 1926. After payment of preferred dividends amounting to $1,050,000 the total deficit for 1927 was $7,908,691 compared with a deficit of $627,578 in 1926 after dividends on the preferred and common B shares.

A statement was issued which in part follows:

The circumstances surrounding the present situation of Yellow Truck & Coach seem to indicate that holders of its preferred stock will be deprived of income thereon for a period of time impossible to predetermine. Feeling that this preferred stock is amply secured as to its ultimate position and recognizing the probability that some of the present holders purchased the preferred stock by reason of General Motors Corporation's investment in the company, General Motors Corporation has authorized for submission to all of the said holders the following offer: For each share of 7 per cent cumulative preferred stock of Yellow Truck General Motors Corporation will pay $93 in cash. This offer expires at the close of business May 10, 1928.

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General Motors Corporation does not recommend either the acceptance or the rejection of the foregoing offer.

General Motors purchased its interest in Yellow Truck as an investment. It in no way guarantees the earnings or securities of Yellow Truck & Coach Manufacturing Company.

At the meeting of directors John D. Hertz resigned as chairman of the board of the Yellow Truck & Coach. John A. Ritchie resigned as vice-chairman and was elected chairman.

Spring Meeting of the Policies Division N.E.M.A.

Adoption of definite recommendations on problems of business policies and merchandising principles will feature the Spring Meeting of the Policies Division, National Electrical Manufacturers Association, March 14-16, Edgewater Beach Hotel, Chicago, Ill.

Action by the division will be requested on the matter of an All-Electrial Industry Show, on tariff matters, and on adequate statistics. A request for definite support of the program of the Electrical Industry Sales Conference will also be presented.

More A.C.F. Coaches for Norway

The American Car & Foundry Company, New York, has recently made another shipment of chassis for motor coaches, to the city of Oslo, Norway. Up to date 39 A.C.F. motor coaches have been purchased for this Norwegian service.

These coaches are powered by the $3\frac{3}{4}$ x 5 in., six cylinder Hall-Scott engine, and have a 198 in. wheelbase. The bodies, built and mounted locally, are similar in design to the modern American coach.

Use of Treadles Grows

An increase of 66 per cent in the use of National Pneumatic Company automatic treadle exit doors in one year is emphasized in a card folder issued by that company. According to the figures given it is stated that 42 cities were operating 1,696 cars and 138 buses equipped with one or more treadle doors a year ago. During 1927 these figures were increased to 64 cities operating 2,829 cars and 216 buses equipped with one or more treadle doors, making a total of over 5,000 doors. A list of the cities in which these cars are operated shows wide geographical distribution of treadle applications.

Last Knoxville Cars to Be Delivered

The last of twelve new cars ordered in 1927 by the Knoxville Power & Light Company, Knoxville, Tenn., are to be delivered in the next ten days. Specifications of these cars, purchased from the Cincinnati Car Company, Winton Place, Ohio, were published in the issues of Dec. 10 and Feb. 25.

METAL, COAL AND MATERIAL PRICES
F. O. B. REFINERY

Metals—New York	Feb. 28, 1928
Copper, electrolytic, cents per lb.	13.70
Copper wire, cents per lb.	16.125
Lead, cents per lb.	6.05
Zinc, cents per lb.	5.8125
Tin, Straits, cents per lb.	51.625
Bituminous Coal, f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	.....
Somerset mine run, Boston, net tons	.....
Pittsburgh mine run, Pittsburgh, net tons.	.....
Franklin, Ill., screenings, Chicago, net tons	1.825
Central, Ill., screenings, Chicago, net tons	1.675
Kansas screenings, Kansas City, net tons..	2.125
Materials	
Rubber-covered wire, N. Y., No. 14, per 1,000 ft.	5.30
Weatherproof wire base, N.Y., cents per lb.	16.50
Cement, Chicago net prices, without bags.	2.05
Linseed oil (5-bbl. lots), N.Y., cents per lb.	10.2
White lead in oil (100-lb. keg), N.Y., cents per lb.	13.25
Turpentine (bbl. lots), N.Y., per gal.	$0.6450

ROLLING STOCK

SEATTLE MUNICIPAL STREET RAILWAY, Seattle, Wash., needs additional passenger buses to take care of the increasing population in Seattle's outlying districts, according to a letter recently sent by D. W. Henderson, superintendent of the street railway department, to O. T. Erickson, chairman of the City Council utilities committee. He recommended the immediate purchase of ten new buses for distribution on the nine bus lines operated by the railway department.

DETROIT MUNICIPAL RAILWAY, Detroit, Mich., has not yet made the awards under its recent call for bids for buses. The American Car & Foundry Company is reported as the low bidder on inquiry for 25 to 100 new motor coaches, bidding $12,962, on gas-electric 40-passenger bus, $11,265 for gas-electric 30-passenger, $10,962 for gas-mechanical 40-passenger and $9,265 for gas-mechanical 30-passenger bus.

TRACK AND LINE

KULP THEFT PROOF LAMP COMPANY, Chicago, Ill., recently announced that through a contract signed between that company and the General Electric Company, the General Electric Company was to begin immediately to manufacture and bill quantities of Kulp light bulbs.

WASHINGTON RAILWAY & ELECTRIC COMPANY, Washington, D. C., has been ordered by the Public Utilities Commission to remove its center trolley poles in Wisconsin Avenue from River Road to the District line and substitute side-pole span-wire construction. The work will not be started, however, until the projected widening of Wisconsin Avenue takes place this year.

TRADE NOTES

WAUGH EQUIPMENT COMPANY, manufacturer of Waugh draft gears, has moved its offices formerly located at 1 Pershing Square, New York, to the new Graybar Building, 420 Lexington Avenue.

BLACK & DECKER MANUFACTURING COMPANY, Towson Heights, Baltimore, Md., has appointed R. C. Bastress, formerly with the Fort Wayne Iron Store Company, to handle Indiana and part of Michigan. L. W. Beuhausen, formerly with Slocum & Kilburn, has been employed to handle Western Massachusetts and G. N. McCarthy will be the representative in Buffalo territory, taking the place of H. B. Austin, who has been transferred to the Chicago district.

MARTINDALE ELECTRIC COMPANY, 1248 W. Fourth Street, Cleveland, Ohio, manufacturer, manufacturers' agent and importer of Martindale motor maintenance equipment products, has recently opened a branch in New York City, at No. 6 East 46th Street in charge of E. H. Mitcham.

OHIO BRASS COMPANY, Mansfield, Ohio, announces the opening of its new offices at 703 Frisco Building, Ninth and Olive Streets, St. Louis, Mo. This office will be the headquarters of H. W. Kilkenny, district sales manager for the company in the St. Louis territory.

LINCOLN ELECTRIC COMPANY, Cleveland, Ohio, announces the retention of A. M. MacFarland as a general sales and development engineer, and states that he will devote his efforts to the development and special application of automatic carbon arc welding, with headquarters at Cleveland.

ADVERTISING LITERATURE

ROLLWAY BEARING COMPANY, INC., Syracuse, N. Y., has recently issued a new catalog 4-A on their wide series and utility type of bearings and also bulletins: Nos. 53—self-aligning pillow blocks equipped with "Rollway" adapter type bearings to fit standard commercial shafting; 54—Various precision types of "Rollway" radial bearings; 55—Self-aligning pillow blocks equipped with standard "Rollway" bearings and 56—Large "Rollway" bearings in the recently adopted international sizes.

PEREY MANUFACTURING COMPANY, INC., New York, has issued a folder entitled: "The Evening Rush—Gathering in the Shekels by Machinery," emphasizing the advantages of the Perey systems.

INTERNATIONAL NICKEL COMPANY, INC., New York, has issued in booklet form a Monel Metal and Nickel Buyers' Guide.

PYRENE MANUFACTURING COMPANY, Newark, N. J., has issued a folder announcing its "Phomene Accumulator" in which it stresses the advantage of its use as fire protection equipment for liquid hazards.

ARMCO CULVERT & FLUME MANUFACTURING ASSOCIATION is issuing an interesting bulletin, "Basing Confidence in Culvert Strength on Engineering Facts."

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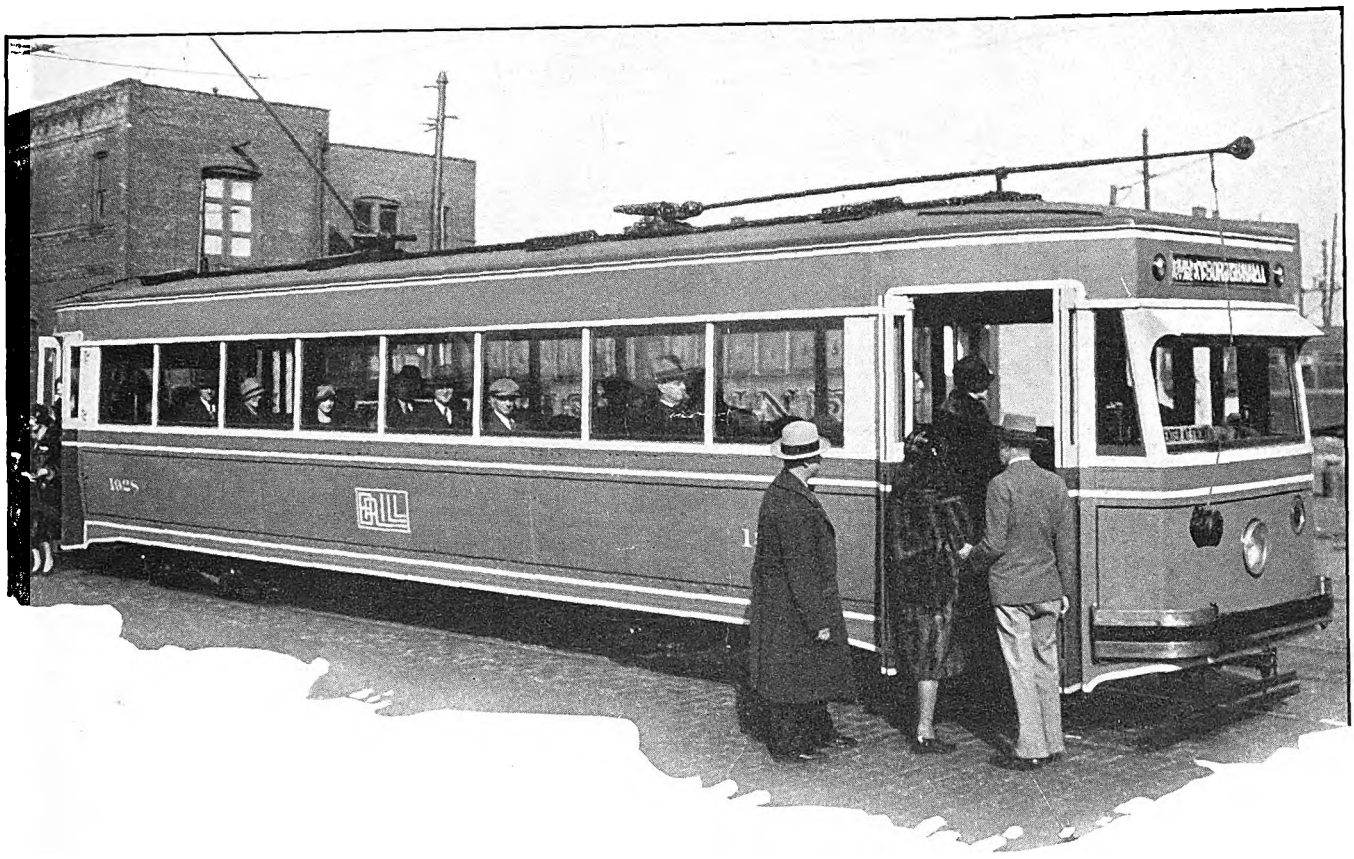

The Last Word in Comfort *and Safety*

The Brill "Car for 1928" was designed to provide a greater degree of safety for passengers in connection with its comfortable riding features.

Consider, first, the low car body which makes boarding and alighting less difficult. Passengers enter at the front and leave at the rear, which reduces accidents inside the car. A full width windshield gives the operator an unobstructed view. The external contracting shoe-type drum brakes are positive in action regardless of the load carried. Complete automatic safety control devices stop the car in emergencies.

A further safety precaution is the interlocking of the brakes with the control of the rear treadle door. This makes it impossible to open the door while the car is in motion or start with the doors open.

In every respect, "The Car for 1928" conforms to the latest ideas in passenger comfort and safety.

Service tests conducted with "The Car for 1928" reveal a number of very favorable performance facts. This informative data is now available. Write for it.

The J. G. Brill Company, Philadelphia
American Car Company, St. Louis
The G. C. Kuhlman Car Co., Cleveland
Wason Manufacturing Co., Springfield, Mass.

Brill "Car for 1928"

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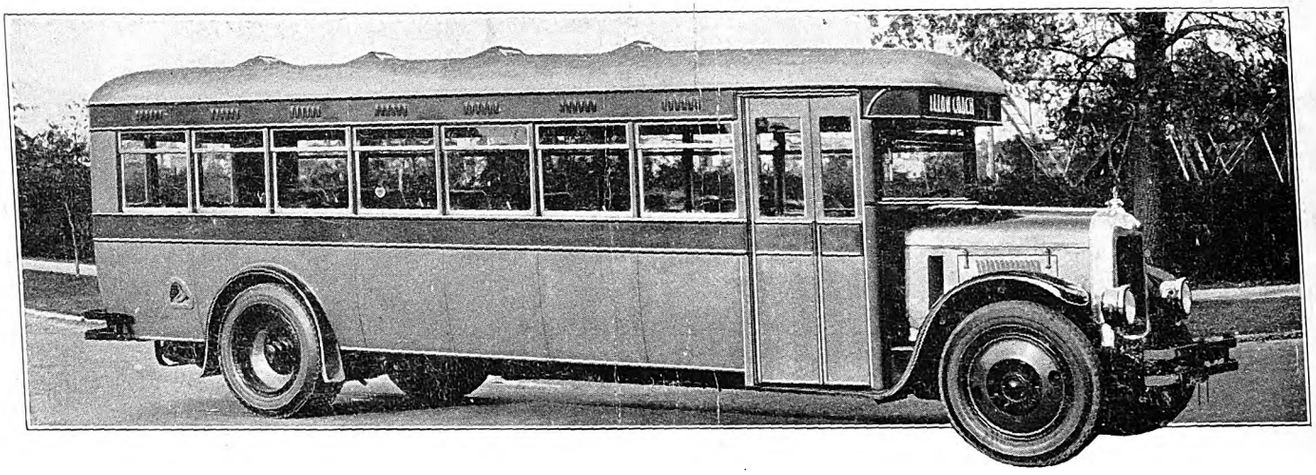

Another

"biggest bus order" *specifies*

TIMKEN AXLES

331 chassis were recently ordered by the Public Service Railway Company of Newark, N. J., from Yellow Truck and Coach Manufacturing Company — a $3,000,000 order; comparing with a similar order in 1925 for 333 busses, also equipped with Timken Axles.

These chassis are of single deck type, dual-drive gas-electric; equipped with Timken Worm-Drive Rear and Timken Front Axles.

This tremendous order is impressive proof of how experience unerringly points to worm-drive as the ideal final drive; for its simplicity, strength, long life, low operating cost.

THE TIMKEN-DETROIT AXLE CO., DETROIT, MICH.

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ELECTRIC RAILWAY JOURNAL

McGraw-Hill Publishing Company, Inc. MARCH 10, 1928 Twenty Cents per Copy

Franklin
2 1928

SCHEDULES must be maintained. The performance must have rider appeal. The balance sheet must reflect economy. Those are the reasons why, when buying buses, so many revenue-transportation experts look for Timken Bearings at the points of hard service.

THE TIMKEN ROLLER BEARING CO., CANTON, OHIO

17-219

TIMKEN Tapered Roller BEARINGS

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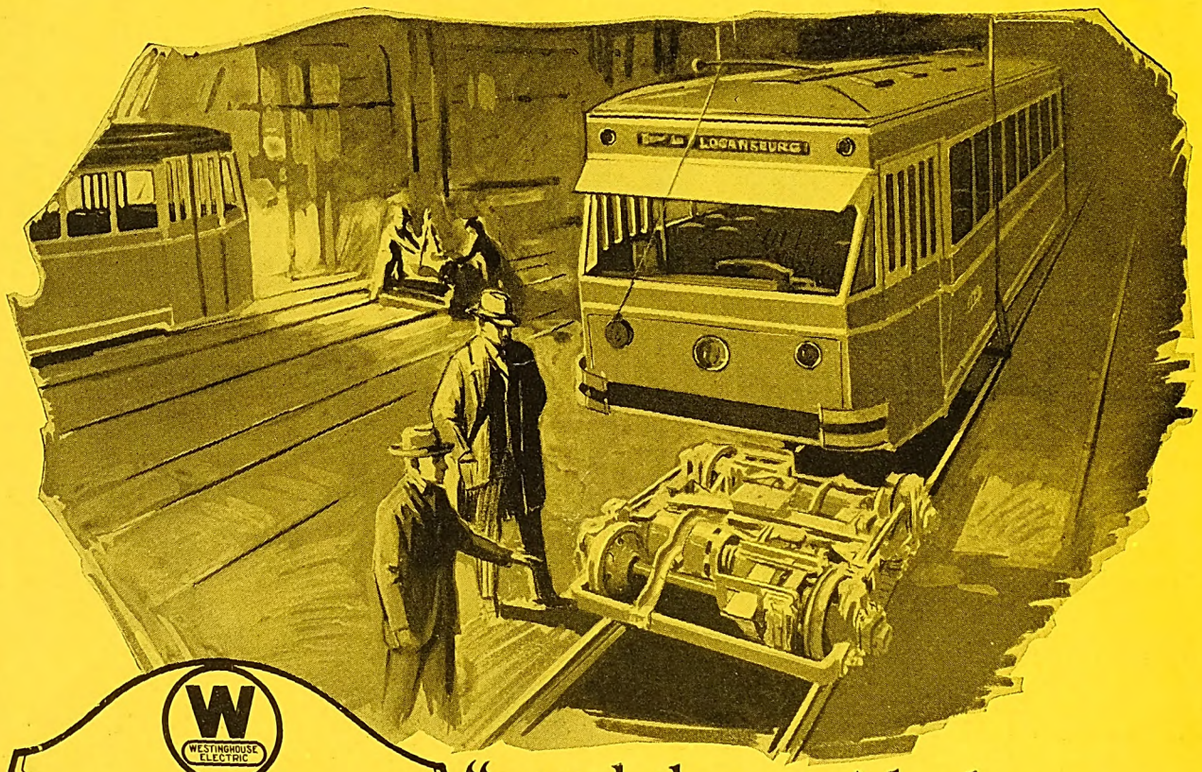
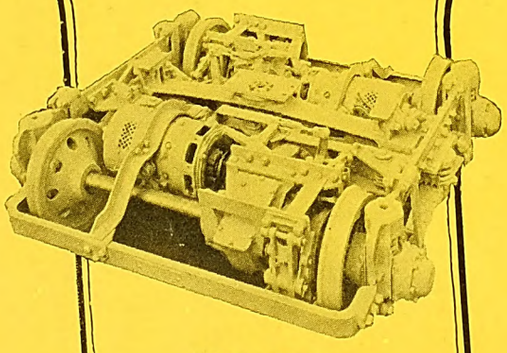


"—and then, with the W-N Drive, the Motor is Spring-Borne"



W-N Drive Installation

W-N Drive advantages

- Lowest steps
- Faster acceleration
- Quiet operation
- Motors spring borne
- Gears run in oil
- Greater clearance
- Lighter weight
- Lower maintenance

THE entire W-N Drive motor is spring supported! The conditions of operation are thus made much more favorable for the motor than those obtaining when the motor is mounted on the axle and subjected to all the roadway shocks.

With the W-N Drive, the motor weight is all carried on the truck frames so that the dead weight is entirely removed from the axle.

The new W-N Drive light-weight, high-speed, low-voltage, spring-borne motor, pronounced the ultimate in modern railway motor design, has been evolved from the vast experience and engineering genius that has been manifested in all of the extensive pioneering by Westinghouse in the development of electric railway equipment.

Write our nearest District Office for a copy of Leaflet 20341.

Westinghouse Electric & Manufacturing Company
East Pittsburgh Pennsylvania
Sales Offices in All Principal Cities of the United States and Foreign Countries

MEMBER AMERICAN ELECTRIC RAILWAY ASSOCIATION AERA 1928

Westinghouse

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Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review
Published by McGraw-Hill Publishing Company, Inc.
CHARLES GORDON, *Editor*

Volume 71 New York, Saturday, March 10, 1928 *Number 10*

Commemorating a Service to Humanity

IF THERE is any doubt left at all about the importance of the rôle played by the individual employee in the success or failure of a railway's operations, that doubt is dissipated by the events following the Brady Safety Medal Award to the Louisville Railway. This company, through its president, J. P. Barnes, accepted the award in the name of its employees, and then gave the men themselves the opportunity of celebrating in adequate fashion their accomplishment in the service of humanity. The unique celebration took the form of two great dinners—one for day men and one for men on night runs—given to 2,400 employees and their wives.

It was particulary fitting that this dinner commemorated two other notable events in Louisville. During the preceding month every carhouse on the property had exceeded the record of 25,000 miles per chargeable accident which had been set as the bogie for eligibility to one of the safety dinners that have come to mean so much to Louisville trainmen. The occasion also witnessed the annual award of the Anthony F. Connelly medal to William T. Kays, a motorman on the Oak Street car line, for outstanding public service. This medal, fittingly named in honor of an employee who died three years ago after 50 years of railway service, has come to typify the spirit of public service on the Louisville property.

There is something deeply impressive in this story of 2,400 trainmen and their wives sitting down at a dinner to celebrate collectively their own good work in the interest of humanity and to honor specially one of their own number who had achieved outstanding recognition. Can one doubt but that each of these men went back to his car with the feeling that his job means something more than merely putting in a given number of hours for a specified rate of remuneration? Suppose, then, that each street car operator went forth daily with the conviction that he is concerned not only with the effect an accident might have upon himself and the company, but also with the discomfort and suffering which it might entail; and suppose that he came to see clearly that an accident avoided through his own alertness, regardless of the carelessness of others, is a direct contribution to the welfare of humanity and to the progress of civilization. Suppose he came to regard himself as entrusted with a power to protect human life and property, equal, or in some respects greater, than that of his superiors.

To establish such an *esprit de corps* in its carhouses is the desire of every progressive railway management. But men do not react to such sentiments until they come to understand in its full significance the part they play in their company and to feel the motives that inspire its management. Since time immemorial, the act of breaking bread with a man has been associated with friendliness; and that is the first step toward confidence and understanding. When motorman and manager sit at the same board to commemorate mutual accomplishment in the preservation of human life and happiness the service of humanity becomes a meeting ground of mutual inspiration. Any man who works in this spirit does not live in vain, and any man who helps him to see himself in this light renders no ephemeral contribution to the transportation industry.

The Doctrine of Thrift Is Still Sound Today

THOMAS E. MITTEN did workers everywhere a real service when in the series of articles about him in the New York *Sun* he sounded a note of warning about following what he called "The New American Religion." He was referring, of course, to the practice, particularly by the wage earners of all classes, of mortgaging their future so as to secure present comforts that they have been led to believe are essential to their happiness. No one decries the right of the worker to aspire to better things—so long as they are better things. It is highly desirable that he should, desirable from his standpoint and desirable from the standpoint of better business. But that desire is fraught with great danger, danger alike to the man who permits his wants to outstrip his capacity to pay, and danger to business itself.

Since electric railways are such large employers of labor, these admonitions may well be sounded through such channels as are at the disposal of the railways. Mr. Mitten sees an economic change as inevitable. He says that the doctrine that prosperity depends upon spending freely and pledging future earnings has been sponsored even by business men who would not consider such a rash policy in the financial management of their own properties. In this he is right. He is just as right as the banker was who some time ago said that the trouble with America is that many men are riding around in Packards who ought to be using Fords and that many are riding around in Fords who ought to be pushing wheelbarrows. There was a certain amount of literary license about this characterization, but there was also about it a very large element of truth.

In the present era of inordinate prosperity in the United States a lot of pseudo economics has been paraded which will not stand the acid test of the crucible of experience. The baser metal of slipshod thinking has passed for the gold of fact. Mr. Mitten pointed out that the wise business man uses the surplus of his good years as a cushion for the bad years and that the business man owes it to his workers and his customers to educate them in similar conduct of their personal finances. Many other far-sighted men in business, particularly those who have fostered employee ownership, have made a serious effort to encourage a sound economic policy among the men in the ranks. In recent years, however, anyone who propounded the idea of thrift was likely to find himself persona non grata in

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many quarters. Thrift and parsimony are very different things that have too often been accepted as one and the same. There is one thing about it—few ever had cause to regret the practice of thrift, but countless numbers have had cause to lament their profligacy. The man who earns $10,000 a year and lives beyond his means is no less profligate than the motorman who permits his outgo to exceed his intake. Each is equally doomed. The doctrine of thrift is as sound today as it was when it was first enunciated by "Poor Richard."

Developing Latent Transport Possibilities

RECENTLY the surprising statement was made by a real estate man that the necessity for adequate parking space will soon force the development of suburban business areas which ultimately will sound the death-knell of retail stores in the larger urban centers. His prediction was based on the difficulty of finding parking space in the centers of certain of the large cities.

A statement such as this certainly shows a very narrow viewpoint. It entirely overlooks the possibilities of public transportation. Should any large number of persons decide to do business in the outskirts because of lack of facilities in the center of the city it would be just that much easier for the street cars and buses to move through the congested districts. This in turn would lead to a larger use of public transport and with it bring greater prosperity for the stores in the central area.

However, to plead for public transportation without giving further thought to it than this would be to leave it just where it has been for a number of years. Even with a reduction in the use of automobiles in the congested district there is need for considering the advantages and limitations of every type of vehicle, both public and private. It is possible to provide better facilities, give higher speeds, and keep the cost commensurate with the value of the service, only if all the transportation agencies are fitted into the picture where they will appear to the best advantage.

Few persons are able to view the entire traffic and transportation problem of a community in such a broad-gage manner that they can determine absolutely the proper place for each of the various vehicles. Even in the matter of parking, well-intentioned city officials have been forced to back down when the merchants have demanded that the ban be lifted. What is needed is not alone co-ordination of services to give real transit relief but a control which will enforce such co-ordination.

A move such as that outlined above has been made in London within recent months in the appointment of a Minister of Transport, who has supervision over all forms of transportation in the metropolitan area. A somewhat similar development has taken place in this country in the appointment of the Port of New York Authority, which has control not only over passenger transport but also over the rivers and harbors in the port and all the rail and highway lines leading to the port. These bodies are making steady progress in dealing with the problems of local transportation. But they are only instances where outstanding communities have attacked the problem. It exists in every city and metropolitan district, and only by careful analysis can the proper solution be arrived at that will give the transport that is needed to develop the possibilities that lie dormant in any locality.

Detroit's Express Line Deserves an Extended Trial

OPERATION of the express street cars service with supplementary local buses on Jefferson Avenue in Detroit is provoking widespread discussion among various factions in the motor city. The article on this operation published in the Jan. 7, 1928, issue of ELECTRICAL RAILWAY JOURNAL has been followed by various supplementary developments. The most recent items, published last week on pages 358 and 376, refer to the results of a questionnaire sent out to operators of automobiles and trucks by the Traffic Survey Bureau of the Detroit Police Department, and to a report made by the city's Rapid Transit Commission.

It is unfortunate that this initial installation includes so many special conditions that the full possibilities of the plan and its suitability for application on other streets and in other cities becomes difficult of determination. Nevertheless it is important, now that the project has been in operation since Sept. 18, 1927, that every effort be made to derive from experience a full analysis of the possibilities and limitations of the idea.

Observation of the Detroit operation indicates several interesting features. First of these is that the elimination of many car stops and the regulation of other traffic to synchronize with the movement of public transportation vehicles speeds up all traffic on the street and materially reduces interference and congestion. Furthermore it has been demonstrated that the scheme of furnishing local service with supplementary buses does not demand an excessive number of buses, because only a small proportion of the passengers carried on the cars actually use the combined service. Of course this situation is subject to considerable variation, depending on the travel characteristics of any given street; but the Jefferson Avenue operation indicates that such a combined service can be operated with only a small proportion of the number of buses that would seem to be required from a purely theoretical analysis of the plan.

Beyond this point it is hard to draw definite conclusions regarding costs or the effectiveness of increased speed in attracting riders. It is important to bear in mind that the present operation includes many expedients and does not represent in any way the full possibilities of the express service. An important change was made in the route simultaneously with the starting of express operation. This consisted of cutting the old Jefferson Avenue-Grand River through line. The experiment was started on a street having many special traffic conditions that are not typical because of the absence of normal cross traffic. Another factor to be considered is that some of the oldest type of cars in Detroit were used for starting the express line. The buses used for the local service were not selected with a view of meeting the particular requirements of this type of service, but were adopted for the purpose merely because they were available. The existence of competition by independent buses and by numerous jitneys, still further complicates the problem of analyzing the economics of the new service.

All of these conditions must be borne in mind when attempting to draw conclusions. Obviously, the success or failure of the idea, or the possibility of its extension should not be judged without considering the various expedients in the present operation. The smoothness with which the operation is being carried out, however, even with these makeshift facilities, and the absence of

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any really serious operating difficulty is particularly worthy of note. When it is considered that the elimination of many stops reduces the need for a conductor and opens the possibility for one-man operation, the wisdom of witholding judgment on the cost of this combined car-bus service becomes obvious. Operation of single cars with one man would reduce the headway between express units in comparison with present two car trains and would thereby make more convenient the transfer from local buses.

It is fitting that this experiment is being conducted in the motor city from which issue the millions of automobiles that create present day traffic congestion throughout the country. The plan of operating surface cars express is worthy of attention both by transportation men and those who represent the community point of view. Prejudice and snap judgment have no place in this consideration. Any plan which offers even a possibility of giving faster service on the one hand and of avoiding or postponing the heavy expenditures demanded by rapid transit construction, strikes directly at the very heart of the transportation and traffic problem in many American cities.

A Convincing Answer by Those Who Use the Service

THE INTERURBAN is dead—long live the interurban! This salutation by residents of Rosedale, Merriam and Shawnee, Kan., will usher in the resumption of railway service on the Hocker line scheduled for April 1. In good measure the laurels for this revival go to the people living along the Hocker line who willingly subscribed $10,000 in order to have service re-established and a dependable transportation system a surety.

Events in the restoration of the Hocker line are worth repeating. Officially known as the Kansas City, Lawrence & Topeka Electric Railroad, this line, operating 21 miles, went into receivership in 1919. After eight years the sale of the property at public auction was ordered by Judge Pollock of the Federal Court in Kansas City, Kan., following a request for a termination of the receivership and sale of the property as scrap. In August, 1927, at the courthouse in Olathe, Kan., it was bought by the Sonken-Galamba Corporation, Kansas City, Kan., for $28,500. Mr. Sonken expressed his intention of junking the line. Immediately, appeals to save the road were voiced by residents and property owners who from then on worked indefatigably for the restoration of railway service. Despite setbacks, delays and disappointments an agreement was finally reached with the Kansas City Public Service Company to furnish power at cost, to rent four cars and to purchase $15,000 in bonds of the new company to be known as the Kansas City, Merriam & Shawnee Railroad.

All this took place, even though the line is paralleled by a fine brick highway on which licensed buses are operated. Apparently the experience of those people whose convenience and property value depend on adequate and reliable public transportation service, wanted the interurban badly enough to dig down into their own pockets for the money needed to restore operation. It is to be hoped that their action will result in the ultimate rehabilitation of the road and in the development of a class of service that will repay them for their public spirit and courage. Here is a convincing answer on the part of those who use the service, to those who would have us believe that the interurban of this type has outlived its usefulness.

"Caveat Emptor" Not Part of Modern Business

WHAT is known as a buyers' market exists at present. There is no disposition to quarrel with the purchaser who seeks legitimately to take advantage of it. It is only natural that every one making purchases should seek to do so on terms favorable to him, but that is not the end in itself. Price is important, but price alone is not the controlling factor, or should not be. Other factors are equally important, because they themselves constitute the value for which the price is paid. The chief concern of the buyer should be to see that he obtains a value proportionate with the price. The chief concern of the seller should be to see that he obtains a price commensurate with the value. Railway men are big buyers. They know that under a fixed fare the service rendered tends to approximate the limits which that fare imposes. They should know that it is equally as poor business for them to be a party to a transaction in which either side is going to lose money as it is for the public or its representatives to be a party to inflicting an inadequate fare on the railway.

Samuel Insull, as quoted by Earl Whitehorne in his recent article in the ELECTRIC RAILWAY JOURNAL, put the matter succinctly in talking to electrical men about purchases when he said that if competition is so keen as to hamper research work and threaten the quality or the rate of development; if margins that are too narrow restrict the wholesaler's ability to carry adequate stocks, supply sales service and extend credit to the retailer the purchaser suffers no less than the seller. And if the policy is carried too far the seller is virtually ruined or forced out of business. It is a complex economic problem that would at first appear not to admit of the entrance of the issue of ethics. But an ethical issue is involved. The pressure that can be brought to bear on the seller is, of course, very great. Some are in a position to resist it stoutly, but others are not so fortunately situated. The secret bid is, of course, one of the greatest hindrances to the correction of present-day abuses. Three recommendations made for reform follow:

1. That bids on standard listed apparatus should be offered for examination by any bidder who is called back and asked for a reduction of his price.

2. That salesmen should demand this as evidence of good faith on the part of the buyer whenever asked to cut a price after bids are in.

3. That post mortems on competitive bids should be made standard practice among all manufacturers so that losers may understand their lost business.

As the advanced thought of the day sees it the seller should not be made to fight for this reform unaided. Purchasing agents individually and as nationally organized should also become the exponents of this idea. It is another step to be taken in the banishing of trickery from trade. In other words, in this era of economic intelligence the gentle art of profiteering by purchasers should be laid away in shrouds along with the wooden nutmeg and that once popular commercial slogan—*caveat emptor.*

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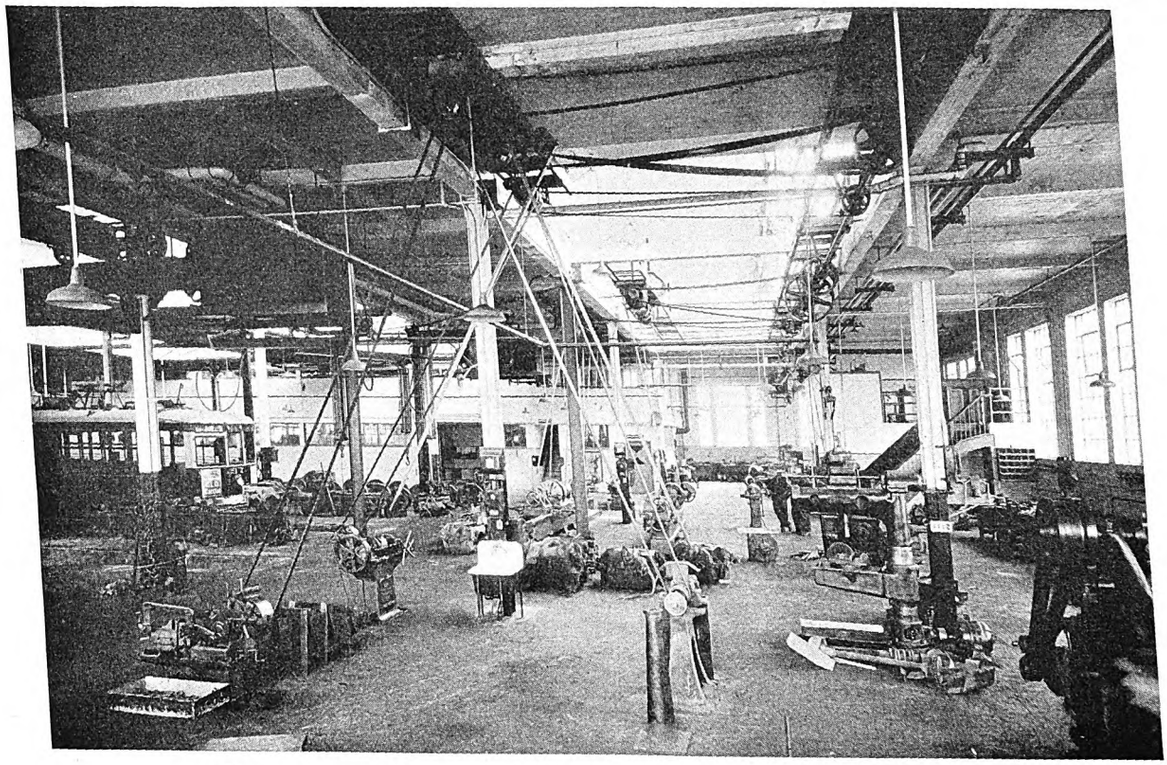
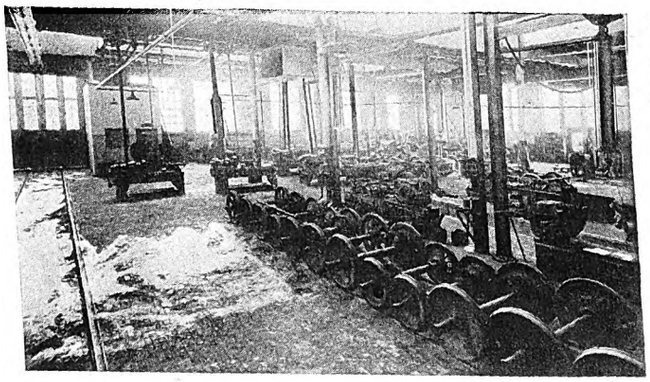
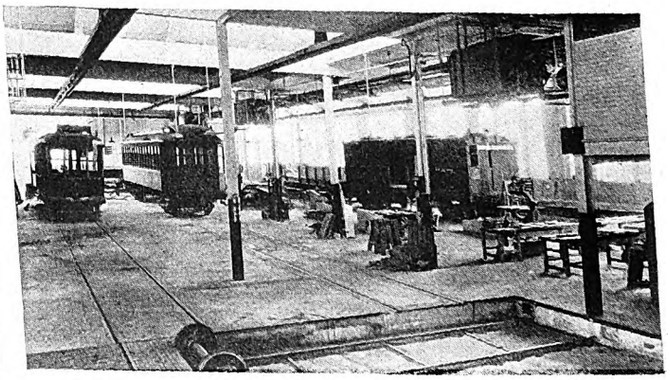


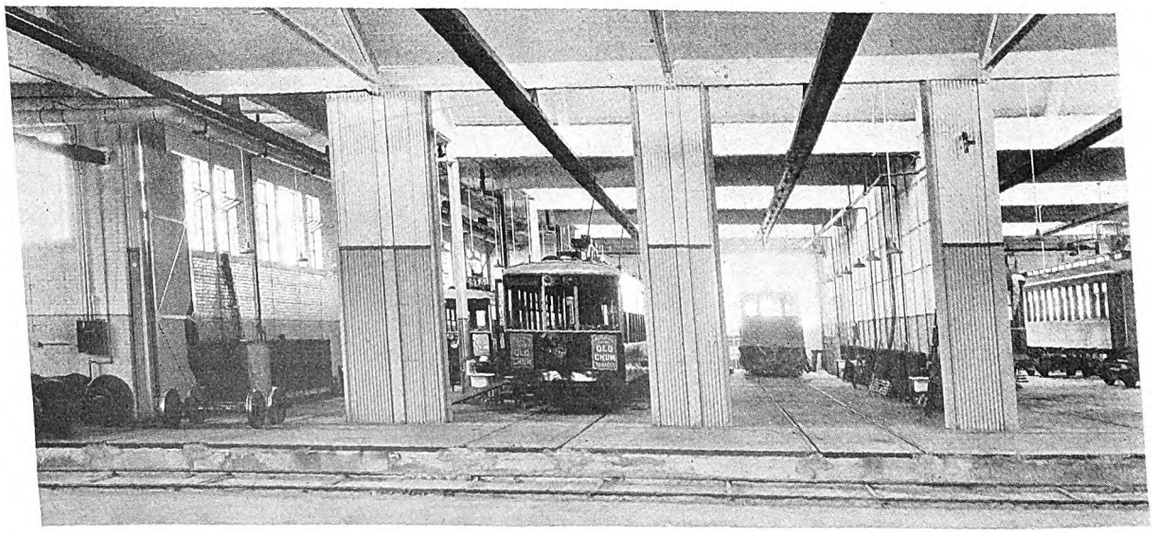
Machine shop, looking from the blacksmith shop toward the stores department



Overhauling and machine shop, looking from the transfer table



View of the woodworking shop from the transfer table



Paint shop, looking from the transfer table

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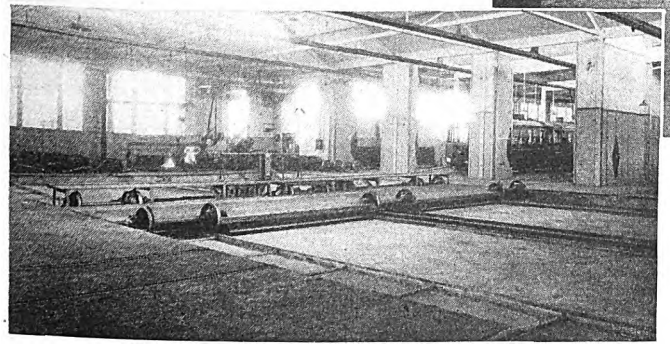
New Repair Shop at Quebec

A main shop building and a carhouse were constructed. Additions provide a boiler room, general storeroom and lumber storage. Interior transfer tables not affected by extreme winter conditions

DIVERSITY of equipment operated was an important factor considered in laying out the new repair shop of the Quebec Railway, Light, Heat & Power Company at Limoilou near the mouth of the St. Charles River. This company supplies all the electric power and gas used in the vicinity of Quebec and operates the city tramway system as well as a 25-mile suburban line to the shrine of St. Anne de Beaupré. Cars for the city division include 63 double-truck and 47 single-truck passenger cars together with 16 miscellaneous cars, making a total of 116. The suburban division has the following cars:

Passenger cars, steam railway type	22
Electric suburban type motor cars	11
Electric suburban type trailer cars	5
Steam locomotives	2
Electric locomotives	4
Freight cars	142
Portable substation	1
Miscellaneous Equipment	7
Total	194

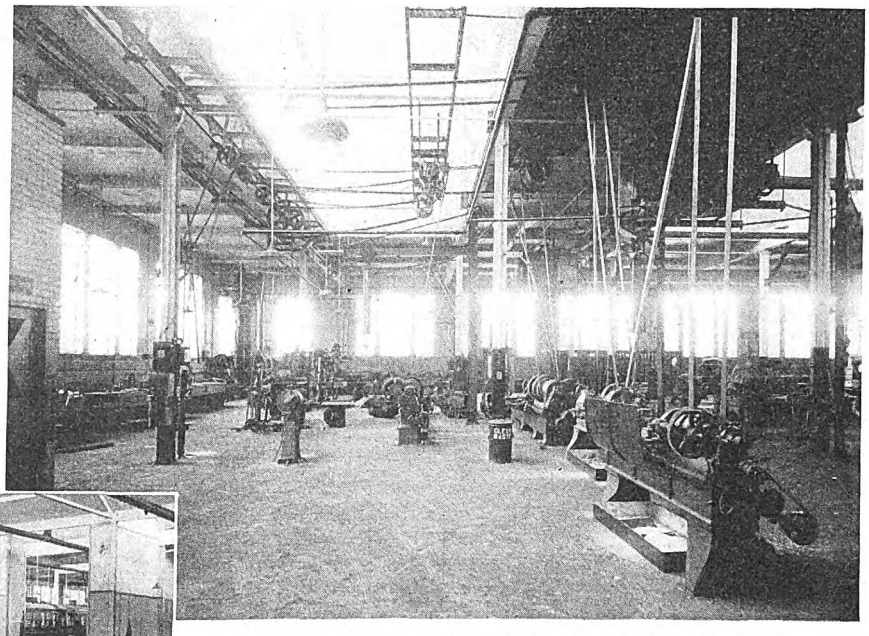
Daily freight and passenger trains of the Canadian National Railway system are operated over the company's tracks between Quebec and St. Joachim, which is the western terminus of the 60-mile branch line of the Canadian National Railway to Murray Bay. In addition to a large amount of local freight, the company serves two large pulp and paper companies with raw material and moves their products back to the trunk line terminals at Quebec. Steam locomotives have been superseded by electric for regular service, but two are kept in readiness for service in case of electrical breakdown.



Transfer table, looking toward the wheel shop and paint shop

The immediate result of the completion of the new shop was the closing down of independent repair shops on the suburban division at St. Anne de Beaupré, and at Montmorency Falls. Repair work previously carried out at the St. Malo, St. John Street and St. Paul Street shops of the city division, has been transferred to the new shop and the former are now operated as carhouses for inspection and storage. The concentration of facilities will allow the carrying out of an effective reconditioning program after which the cost of maintenance should decrease.

The buildings are of light buff-colored Citadel brick with steel sash and skylights. Roof members and supporting columns are of steel with gypsum fireproof covering. This results in a very favorable insurance rating. Floors are of concrete base with creosoted wood block surfaces. The main building is 312 ft. long and 138 ft. wide. Additions provide space for the boiler room, lumber storage, wheel stores, and general stores. The building occupied by the stores department is two stories high, the upper part being used for the lighter material and for the offices of the superintendent of equipment and general foreman. The stores for all departments of the company are now concentrated at this point.



Machine shop, looking from the armature repair department

In the design and layout of the buildings, consideration has been given to an arrangement which will allow for general extensions without altering existing plans and loss of efficiency. The shops were planned by P. J. Quinn, superintendent of equipment, co-operating with D. E. Blair, general superintendent of the Montreal Tramways. The buildings were designed and constructed under the supervision of John S. Archibald, architect, of Montreal.

Climatic conditions in winter are such that the entrances were limited to a main lead-in track feeding an interior transfer table from the north side, and a special rear entrance for long wheelbase steam locomotives in the south end of the building. This south track

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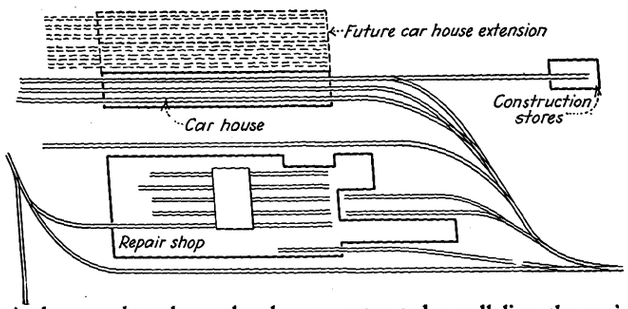


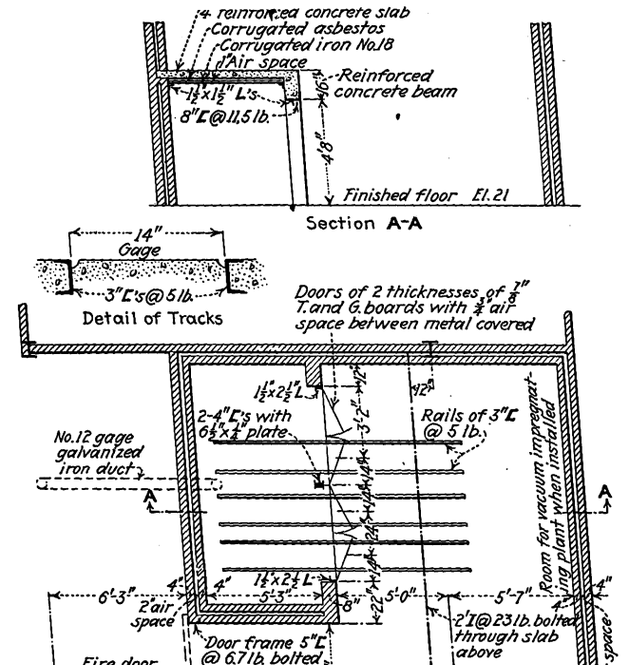
A three-track carhouse has been constructed paralleling the main shop. Ultimately it will be a nine-track building

is also used during the summer months for repairing the large number of box and freight cars used on the suburban system.

As shown on the accompanying plan, the section of the shop north of the transfer table is devoted to overhauling work and machine shop work. Four tracks, each with a pit, lead into this section from the transfer table. Two of these overhauling tracks are fitted with Columbia car hoists and provision has been made for the installation of a third when necessary. A 10,000-lb. traveling electric crane over the truck repair tracks is used for dismantling and handling the heavy electric locomotive equipment. The runways of this crane can be extended as required. Jib cranes serve the motor overhauling tracks and benches as well as the two heavy lathes in the machine shop.

The machine shop is well equipped to carry out the kinds of railway repairs necessary. A list of the various machine tools is given on the accompanying plan. Space has been reserved for the installation of a planer and some other machine tools as these become necessary for economical operation. Machine tools that are used intermittently have direct motor drive. Lathes, drill presses and other tools in constant use are driven in groups from line shafts with counter shafts.

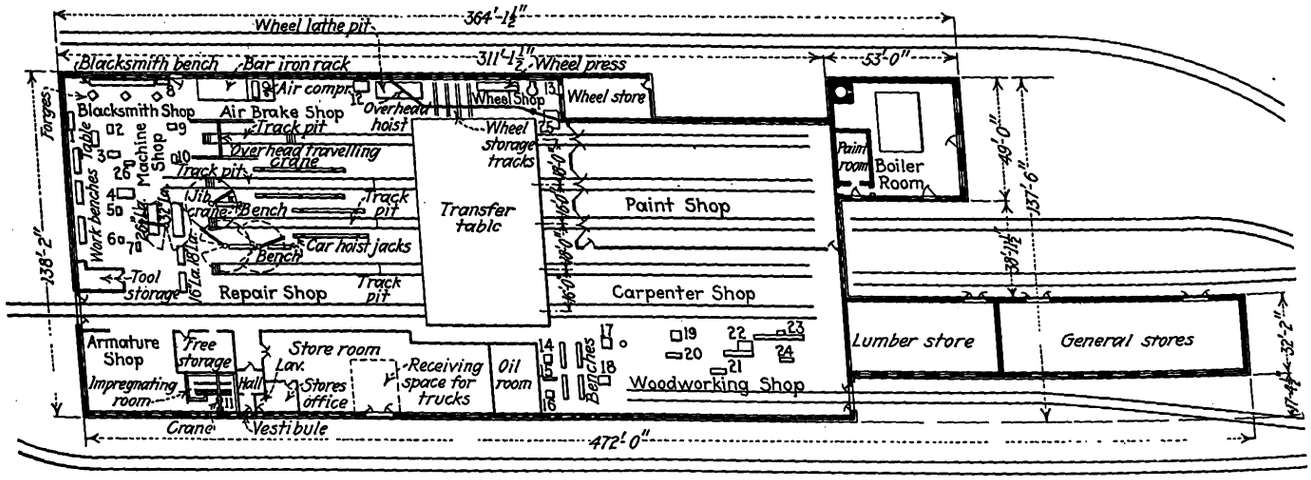
The blacksmith shop, located in the northeast corner, is equipped with Canadian Blower & Forge Company's down-draft forges. The air brake shop is along the east



Layout and details of the impregnating room

wall adjacent to the blacksmith section, and just south of this and at the end of the transfer table, is the wheel shop. This is fully equipped with a double-drive wheel turning lathe, wheel-boring machine, wheel press, axle racks and storage trucks for wheels mounted on axles. This department is so placed that wheels and axles can be handled to and from the shop and to outside stations with a minimum of labor and no interference with working tracks. The wheel storage is just south of the wheel shop.

The northwest corner of the shop is taken up with the armature repairing department. This is equipped with an overhead traveler carrying an 8-in. air hoist. An im-



Floor Plan of New Quebec Shop

1. *Blacksmith's tool rack.*
2. *Power hammer.*
3. *Radial drill.*
4. *Shaper.*
5. *20-in. drill.*
6. *Sensitive drill.*
7. *Tool grinder.*
8. *Babbitt tool rack.*
9. *Hacksaw.*
10. *Bolt cutter.*
11. *Dipping pit.*
12. *Cleaning tank.*
13. *Wheel borer.*
14. *Knife grinder.*
15. *Grindstone.*
16. *Saw grinder.*
17. *Shaper.*
18. *Bandsaw.*
19. *Chain and H. C. mortiser.*
20. *Molder.*
21. *Jointer.*
22. *Surfacer.*
23. *Crosscut saw.*
24. *Ripsaw.*
25. *Spare axle rack.*
26. *Wet grinder.*

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pregnating room is provided which is arranged for dipping and baking of armatures and field coils. The baking oven is heated electrically and is served by an overhead hoist and small trucks on rails, each truck having a capacity of five armatures standing vertically. Drip pans are provided beneath each truck. A free storeroom in this location provides for safe-keeping and handling of repaired equipment parts.

The woodworking mill, carpenter shop and painter's departments are located at the south end of the shop. All woodworking tools have independent motor drive. The woodworking shop is arranged so that the large quantity of lumber entering into the repairs of wooden box cars and freight cars can be handled from the lumber room through the proper machine onto the car repair track by the most direct and shortest possible route. A separate fireproof paint-mixing room is provided at one end of the paint shop.

The transfer table occupying the central position in the shop serves all departments. It has a capacity for handling 60-ton electric locomotives. Compressed air outlets have been installed throughout the shop for various purposes. These are supplied by a 100-ft. air compressor located adjacent to the air brake department.

A new carhouse just east of the general shop is 312 ft. 4 in. long and 46 ft. 4 in. wide. It has three tracks, each with a pit. This is the first bay of what will ultimately be a nine-track operating carhouse and is parallel and close to the main shop for convenience. The pits are equipped with Watson-Stillman hydraulic pit jacks supported by rails set into the concrete pit floor.

Heating of the building is partly by direct ceiling type heaters with electrically operated blowers, and partly by wall radiators placed under the windows in the main repair shops and service section.

Rapid Transit Faster Than Autos

SOME interesting figures regarding the relative time consumed by and the convenience afforded to suburban commuters in traveling to and from Chicago's Loop district by automobile, elevated train and steam railroad are given in a survey by the Chicago *Tribune*.

Taking a central point in the north side suburb of Evanston, the test showed that the Chicago & Northwestern steam line commuters accomplished the 10-mile journey to the "heart of the Loop" in 39 minutes, elevated line travelers in 45 minutes and motorists in 48 minutes. In actual riding minutes, however, the trip by elevated was thirteen minutes faster than by automobile and ten minutes slower than by the steam line express trains, as the figures were based on a five-minute walk to the elevated and steam road stations, but with no walk for the motorist. The test was made at the height of the morning rush hour. In the automobile test no attempt was made to speed. The return trip during the evening rush hour showed the elevated line commuter six minutes slower in reaching his destination than the autoist and twenty minutes slower than the steam road user, but in actual riding time he consumed about four minutes less than the motorist did.

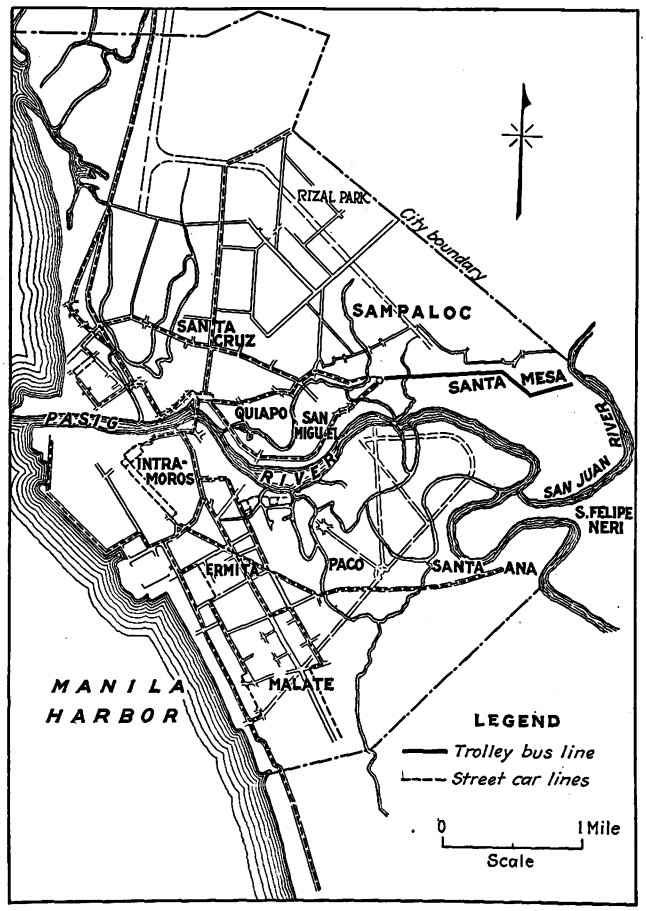
Similar studies made of transportation service from the south side of Chicago brought out that the electrified Illinois Central Railroad service in one direction is three minutes faster for the 10-mile trip from 81st street to the Loop than the automobile and five minutes faster in the other.

Manila to Use Trolley Buses

Economy of electric operation and need for reconstructing track if street car service were continued led to their purchase

EIGHT Twin Coach trolley buses have been purchased by the Manila Electric Company, Manila, P. I., operated by the J. G. White Management Corporation, New York, N. Y., to replace the street cars on the San Juan line of the property. The need of reconstructing all track of this line and the economy of the electric operation prompted the purchase of the trolley buses in preference to rail cars or gasoline buses.

The route, shown in the accompanying map, extends on Calle Santa Mesa from the Rotonda to the bridge over the San Juan River at the city limits, and is 2.96 miles in length. Calle Santa Mesa is a narrow street and is subject to heavy traffic. Continued operation of the street cars would have required construction of double track, at a cost of approximately $100,000.



The new trolley buses on the San Juan line will feed two lines entering the central business district of Manila

The management of the Manila Electric Company was convinced of the practicability of operating trolley buses in the Orient by the example of the electric railway in Shanghai. This company has been operating trolley buses successfully for ten years and is planning to extend this class of service. The street railway in Singapore also is planning to use the new type of vehicle. The Shanghai installation is the more convincing since commodity costs are much lower in Shanghai than in Manila and labor costs there are only 20 to 25 per cent as much.

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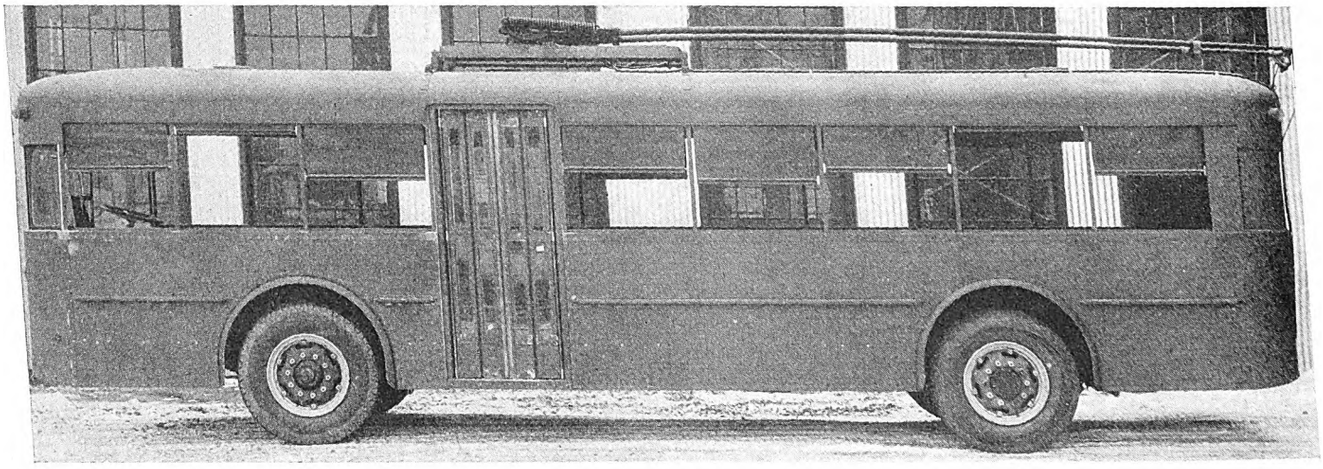
As mentioned previously, the buses will replace the street cars now operating on the San Juan line and will feed two trolley lines routed from the Rotonda to the heart of the city. Six buses will be used on regular schedules while two will be retained as extras. A headway of ten minutes will be maintained throughout a sixteen-hour day with a reduction to 3½ minutes during rush hours. To give this service it is estimated that 196,100 bus-miles will be operated annually. An average speed of 8.88 m.p.h. will be maintained over the route.

Considering both operating costs and fixed charges trolley buses were considered to offer the least expensive type of vehicle, figures being on a vehicle-mile basis. The cost of operating rail cars was found to be 29.6 per cent and the gasoline buses 36.4 per cent greater than the trolley buses. The high cost of gasoline in the Philippine Islands makes the gasoline buses very expensive. The comparative costs as computed on a vehicle-mile basis for the street car and the trolley bus are given in the accompanying table.

COMPARATIVE OPERATING COSTS OF STREET CARS AND TROLLEY BUSES, COMPUTED ON A VEHICLE-MILE BASIS

	Street Car	Trolley Bus
Way and structures	$0.0170	$0.0085
Equipment	0.0170	0.0360
Power	0.0255	0.0176
Conducting transportation	0.0600	0.0600
Traffic	0.0019	0.0019
General and miscellaneous	0.0290	0.0290
Totals	$0.1504	$0.1530

to 600 volts. Cartridge fuses inclosed in a metal box are provided in each side of the line to protect the motors from severe overloads and short circuits. The controller is operated by a pedal and spring arrangement which permits the operator to use both hands for steering the bus. The master controller handles only the small current used to actuate the contactors which in turn handle the motor current. The master controller has seven positions, with seven corresponding contactor combinations. The rotation of the motor is reversed by a G.E. DH-69 reverse switch, hand operated.



One of the Twin Coach trolley buses assembled but not painted. A separate base and trolley pole are provided for each overhead conductor

Fixed charges, including interest, taxes and depreciation, respectively total 14.6 per cent and 16.3 per cent of the street car and trolley bus investments. Including $100,000 for track work and approximately $20,000 for paving charges the sum required to continue street cars was found to be $215,700, as against $104,350, including a $10,000 paving charge, the cost of starting trolley bus operation.

Considering both operating costs and fixed charges the comparative figures on a vehicle-mile basis are $0.311 and $0.240, for the street car and trolley bus, respectively. The actual saving was estimated to be $14,000 per year.

The buses, manufactured by the Twin Coach Corporation, Kent, Ohio, use the single-deck street car type Twin Coach chassis and body with a seating capacity of 40. Electric motors replace the engines of the standard automotive unit. The bodies are designed for two-man operation with an entrance on the left side ahead of the center.

All electrical equipment for the buses was furnished by the General Electric Company. Two 600-volt G.E. 1126-A railway motors are used and a G.E. C-154 master controller. The controller is similar in construction to the usual street car controller, but much smaller. It is of the series-parallel type, having four steps series and three steps parallel, and will operate over a range of 300

A complete trolley base and pole is provided for each of the two overhead conductors. The poles have swivel harps and at moderate speeds the bus can diverge from 8 to 9 ft. from its regular course. The trolley poles are of sufficient length to accommodate overhead ranging from 16 to 22 ft. above the street.

The motor circuit resistors are iron grids insulated from their support and one another by mica. They are mounted under the bus body with supplemental insulation between the resistor frames and the floor. Cables for the motor control and lighting circuits have one layer of tape and one layer of compound-filled braid over the rubber. A switch connected to the emergency brake handle automatically cuts off power from the motor when the emergency brakes, which act on drums anchored integrally to each electric motor, are set.

The lighting system consists of twenty 30-watt, 30-volt lamps in series. The bus interior is illuminated by ten dome fixtures.

A test of one of the completed buses was conducted near the Twin Coach plant in Kent, Ohio, on Jan. 31, under the supervision of the factory officials and F. L. Aime of the J. G. White Management Corporation. D. C. Green, vice-president Utah Light & Traction Company, Salt Lake City, Utah, and Edward A. West, general manager of the same company also attended the test.

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North Shore Line Uses

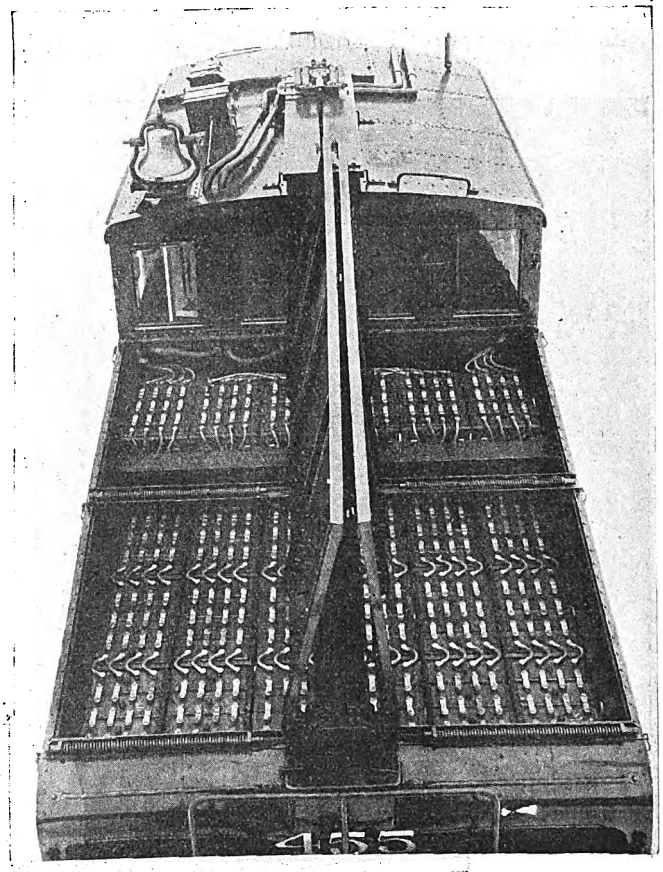
Combination Trolley and Battery Locomotives

By F. H. Brehob
Railway Engineering Department, General Electric Company

TWO combination trolley and battery locomotives of a new type have just been placed in service by the Chicago, North Shore & Milwaukee Railroad. Provision is made for charging the battery from the trolley supply when necessary. The locomotive is thus available for use both on the trolley system and on tracks not so equipped.

Each of the two-axle swivel equalized trucks has a cast-steel transom and built-up side frames, rigidly bolted together. The journals are of the A.R.A. collar type, size 6 in. x 11 in. Brake cylinders are mounted directly on the trucks, eliminating brake rigging from underneath the platform.

The steeple-type cab has a control station at each end of the central compartment with the control equipment in the middle. The battery is located in the two sloping end cabs and is divided equally between them. The battery cells are in a single tier, permitting convenient access for the addition of water. Holes cut in the floor underneath the trays provide for ventilation of the batteries, permitting the heat to escape through ventilators built into the battery compartment covers. The cab rests on a platform with structural steel framing, riveted and braced to the floor plate. Spring draft gear is attached to the center sills of the platform.



Trolley-battery locomotive—70 tons, 600 volts. The top view shows the battery in place

Four GE-251 single-geared, commutating pole, box-frame type motors are suspended on the axles and truck transoms. Each motor has a continuous rating of 4,250 lb. tractive effort, using a 69-tooth gear and a 17-tooth pinion. The motors are ventilated by an electrically driven blower in the central cab, with an intake drawing the air from the outside and discharging it to the motors through a duct built into the platform. Smaller ducts with sliding flanges distribute the air to the traction motors through the top of the magnet frame.

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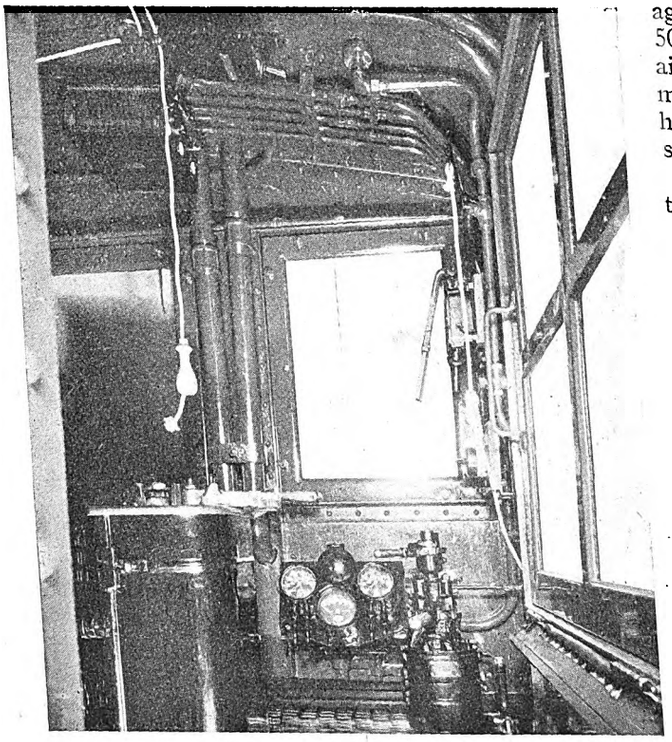
The control equipment is type M, multiple unit, with a master controller at each operating position. The main power contactors are actuated magnetically and the motor reverser is electro-pneumatic. Three-speed control is provided from either trolley or battery power. Transfer from trolley to battery power is automatic. A relay actuates the transfer contactors. In order to restore trolley power, however, it is necessary to move the master controller to the first notch.

Besides the air pressure gages, an ammeter at each operating position indicates the current flowing through one motor. There is also an ampere-hour meter in the battery circuit to indicate the state of charge of the battery.

Electric heaters of the sheathed wire type are located



View of operator's position

near the operating positions connected in the trolley circuit only. Power for operating the control and lights is supplied by the battery at all times. One sixteen-point coupler socket at each end of the locomotive permits use of two locomotives in multiple unit. Neither battery nor trolley are bussed through so that each locomotive receives its own power for traction purposes.

An Exide Ironclad battery is used, consisting of 192 cells, type MVA-41, furnished by the Electric Storage Battery Company. The battery is grounded at the midpoint. This reduces the voltage stress to ground to one-half battery voltage or about 225 volts. A switch breaks the battery into two sections, ungrounded, making it safe for maintenance and the addition of water.

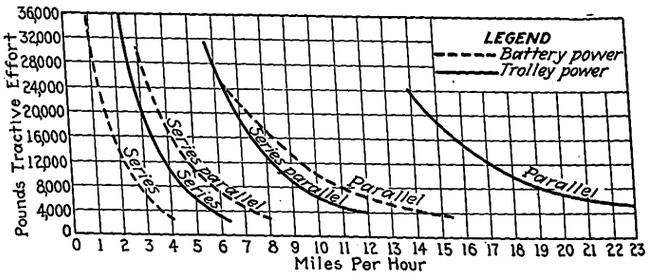
A 25-kw. motor-generator set is located in the main cab. Its control is automatic by the use of a contact in the ampere-hour meter. When the battery becomes fully charged, this contact automatically causes the motor-generator set to be shut down. When the battery becomes about 15 per cent discharged again, the set is started automatically. If, while the motor-generator set is running, the locomotive leaves the electrified line, the set will shut down, and it will start again upon the return of trolley power without attention from the operator.

Weights		Dimensions	
Electrical equipment	68,000 lb.	Height over cab	12 ft. 1 in.
Air brake and compressor	5,000 lb.	Width of main cab	9 ft. 8 in.
Mechanical portion	67,000 lb.	Length of main cab	11 ft. 6 in.
		Width of auxiliary cab	9 ft. 8 in.
Total, all on drivers	140,000 lb.	Lgth of auxiliary cab	11 ft. 6 in.
Per driving axle	35,000 lb.	Lgth between knuckles	40 ft. 0 in.
Minimum radius of curvature, locomotive alone	50 ft.	Rigid wheelbase	7 ft. 2 in.
Maximum speed	40 m.p.h.	Total wheelbase	28 ft. 8 in.
		Diameter of wheels	36 in

Battery Characteristics	
Ampere-hour capacity at six-hour rate	680
Average volts at six-hour rate	380
Kilowatt-hour capacity at six-hour rate	258
Maximum discharge rate in amperes	3,000
Maximum kilowatt discharge rate	600
Approximate weight of battery, pounds	30,000

Westinghouse 14-EL partial schedule straight and automatic air brake equipment is furnished. The leverage is so proportioned to give 75 per cent braking with 50 lb. cylinder pressure. Two General Electric CP-30 air compressors have a rated capacity of 35 cu.ft. per minute each. A hand brake operated from the main cab has sufficient power to hold the locomotive at a standstill on a grade.

The accompanying speed-tractive effort curve shows the operating characteristics. The one-hour rating is



Speed-tractive effort curve

22,000 lb. at 14 m.p.h. and the continuous rating is 17,000 lb. at 15 m.p.h. when operating from a 600-volt trolley.

The accompanying tabulation gives the principal data for this locomotive.

Milwaukee Issues Attractive Route Guide

DISTRIBUTION of a new street railway and motor bus guide is now being made to the public of Milwaukee by the Milwaukee Electric Railway & Light Company. An edition of 300,000 was printed. The guide is an attractive sheet, 12x18 in., folded in timetable form, having on one side a map of the city showing all street car and motor bus routes. The other side has an index of Milwaukee streets, list of places of interest in the city reached by street car and motor bus and a small map of the interurban system of the company, which covers southeastern Wisconsin by both rail and bus lines.

Early this year Milwaukee underwent quite a street name changing program so that the map and street guide is particularly welcome at this time. The maps are being given out on the street cars, at the information desk in the Public Service Building, at several bus and railway stations and at the company's ticket office. Copies have also been distributed to information bureaus, travel bureaus, hotels and newspapers. The maps are being advertised on dash signs and interior car cards.

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Inert Gas Protects Bus Fuel

in Paris

An inert gas, largely nitrogen, is kept in contact with the surface of stored fuel both in the main fuel supply station and in the various operating garages

By Henry W. Blake
Senior Editor "Electric Railway Journal"

Photo by Brown Bros.

Place de la Concorde, Paris, looking north. This is a busy traffic center. Two buses are shown loading at the right. Near the foreground is a double electric railway track which crosses the place here on an avenue known as the Quai des Tuileries

IN ALL fuel reservoirs of the Paris tramway and bus system an inert gas is kept in contact with the fluid to reduce the danger of accidental combustion. This plan is followed both in the main receiving reservoirs and in those of the various operating garages where the buses are charged with fuel.

As mentioned in a previous article in this paper, the fuel used for buses in Paris is a mixture of gasoline, alcohol and kerosene. Most of this material is received in Paris by rail over the Nord Railway, one of the main steam railroad lines of France. A switch track from this railroad leads into the main fuel storage yard of the S.T.C.R.P., the initials of the company operating the street railways and buses in Paris. There are also branch tracks into this storage yard from the electric railway system. The railroad tank cars holding the fuel discharge their loads directly into the company's storage reservoirs, which have an aggregate capacity of about 1,600,000 liters (445,000 gal.) or a supply for about three weeks. This large capacity is provided to avoid interruptions to the service if delay occurs in the receipt of fuel. From these storage reesrvoirs the fuel is distributed each day to the different garages by means of tank trucks with a capacity of from 4,000 to 5,000 liters (1,000 to 1,300 gal.) each. While in storage, the fuel is kept from the air by the use of inert gas, according to the Rolland and Maurice system.

Under this system the greater amount of the inert gas is used indefinitely, additions to it being necessary only to compensate for small losses which occur from various causes. The general arrangement at the main storage reservoir is shown in Fig. 1. The arrangement consists

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essentially of a group of tanks, *R*, and a compressor, *C*, which is operated by an electric motor, *D*, which, in turn is controlled by an automatic switch, *E*.

When a railroad tank car arrives to discharge its contents, as shown at *V*, the air pump, *C*, is put in operation, exhausting the inert gas contained in the tank, *R*, through the piping, 5, and storing it in the accumulator, *A*. The amount of inert gas taken out is equivalent in volume under atmospheric pressure to the amount of fuel in volume admitted into the tank reservoir. When the tank car has discharged its contents no air is allowed to enter the system, as the receiving pipe is automatically shut off by a valve which is located on piping system No. 1.

To transfer fuel from the underground tank to the tank wagon the inert gas in the accumulator, *A*, is admitted under pressure to one of the reservoirs *R* through a pressure regulator, *M*. The fuel then passes up through pipe 2 and flows out by cock *B*.

In the main storage yard there are 22 tanks, each of 65 cu.m. (about 20,000 gal.) capacity. Each has a diameter of 3.15 m. (10 ft. 4 in.) and a length of 8.50 m. (27 ft. 10 in.). They rest on supports in a large pit, which has a concrete floor. These reservoir tanks are arranged in seven groups. One of these groups includes four tanks, and each of the others consists of three tanks. Each group has a storage inlet and a discharge outlet.

There are five piping systems leading to each tank, and each piping system is fitted with a cut-off valve at the dome of each tank. These piping systems are numbered in the drawing as follows:

1 is the piping through which fuel is admitted into the reservoirs. It is connected with the storing inlet.

2 is the piping through which fuel is taken from the reservoirs. It is connected with the discharge outlet.

3 is known as the safety piping. It is of lead and connects with the piping of the discharge system, as will be explained later.

4 is the piping for admitting the inert gas from the accumulator to the reservoir tanks, *R*. 5 is the piping for removing the inert gas from the reservoir, *R*. At its outer end this piping is connected to the exhaust of the air pump.

All of the cut-off valves mentioned are operated by handwheels located in boxes on the surface of the ground. Each box also contains a gage to indicate the pressure in the tank, and another to give the volume of the liquid contained in it.

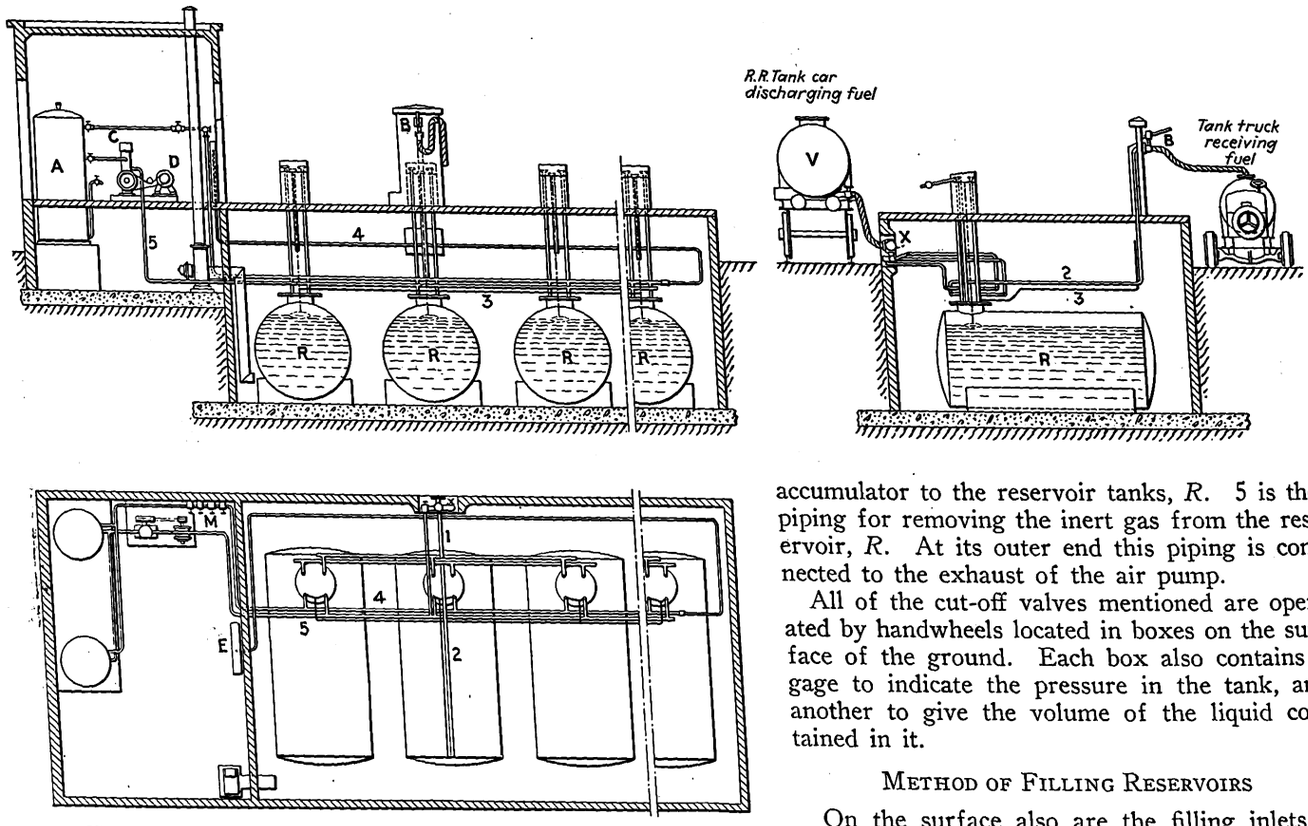

Fig. 1—Plan and sections of fuel reservoirs, inert gas accumulator, piping, etc.

LIST OF EQUIPMENT

A = inert gas accumulator
B = safety cock
C = electrically driven compressor
D = electric motor
E = automatic electric control switch
M = pressure regulator
R = fuel reservoirs
V = railroad tank car
X = three-way valve

LIST OF PIPING

1 = piping for leading fuel from railroad tank car to main reservoirs
2 = piping for discharging fuel from main reservoirs to tank truck
3 = safety piping
4 = piping for admitting inert gas from gas accumulator to fuel reservoirs
5 = piping for exhausting inert gas from fuel reservoirs

Method of Filling Reservoirs

On the surface also are the filling inlets, a three-way cock which controls the movement of the inert gas and a safety device to prevent the entry of air into the reservoir when the tank car has finished discharging its contents into the reservoirs. This device, shown in section in Fig. 2, contains a float which lifts a valve when it is completely submerged and permits the liquid to pass through. As soon as the flow ceases a spring draws the valve back on its seat and closes the pipe.

Filling Station for the Motor Trucks

A feature of the equipment for discharging the fuel from the underground reservoirs into the tank trucks is a safety cock, which is designed to avoid any spilling of the fuel if any of the pipes should break. The location is shown at *B* in Fig. 1, shown above, and in detail in Fig. 3, which is a vertical section of this device. In the latter drawing the fuel, discharging from the underground reservoir into the tank truck, flows in the pipe *a*, through the valve *D* into the pipe *a'*. The valve, *D*, is controlled by a piston, *B*, which has an opening, *G*. When the valve, *D*, is closed and the outlet is not in use, this opening, *G*, connects pipe *b* with pipe *b'*. All the

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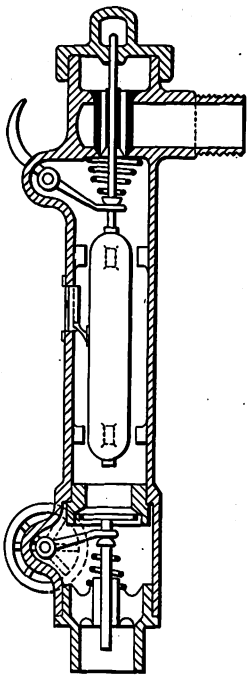

Fig. 2—Safety cut-off on receiving piping

outlet cocks are arranged in series so that the tube *b* in one connects with the tube *b'* in the preceding cock and so on to the first cock, whose tube *b* is tapped in to the dome of its main reservoir *R*, in Fig. 1. The tube *b'* in the last cock in the series is connected with the end of the fuel piping 2 before it reaches the cut-off valve. The result is that when all the cocks are closed all the liquid in pipe 2 at each outlet exhausts immediately into reservoir *R*.

Piping 3 is in parallel with piping 2. It is of lead and is installed so that if a rupture occurs it will take place in the lead pipe rather than in piping 2, which is of steel.

Engine Room

At the western end of the fuel storage plant is the engine room, which contains ten inert gas accumulators, shown in elevation at *A* in Fig. 1. Each of these accumulators measures about 23 ft. long and 4 ft. in diameter and is fitted with a safety valve. In these accumulators the inert gas can be compressed to about five atmospheres. Adjoining the accumulators is a compressor with its electric motor. There is also the automatic electric control switch, already mentioned and shown at *E* in Fig. 1. Its function is to bring back the pressure in the fuel reservoirs to atmospheric pressure after the pressure has been increased for the purpose of discharging fuel.

Finally, in the engine room there is a blower for ventilating the pit in which the fuel reservoirs are contained. the air from this blower escapes from the pit through four outlets. There is a passageway between the engine room and a pit containing the fuel reservoirs.

The entire property is inclosed on all sides by a wall 11 ft. high and 9 in. thick.

Railway Connections

Two tracks, connecting at one point with the Nord Railway and at another point with the tramway system, permit the entrance of tank cars and provide for their removal after their contents have been discharged.

The rules in force forbid the movement of these cars while within the grounds by either steam or electric tractors. Instead, they are moved by cable. This is accomplished by means of two electrically operated capstans which are located on each side of the depot but outside of it. The apparatus for producing the inert gas is located outside of the main warehouse as shown in the plan of the property. The generating plant consists of an ordinary two-cylinder gas engine driving a compressor used to force the inert gas produced into the accumulators. A second gas engine adjoins the other for use in case its services should be needed.

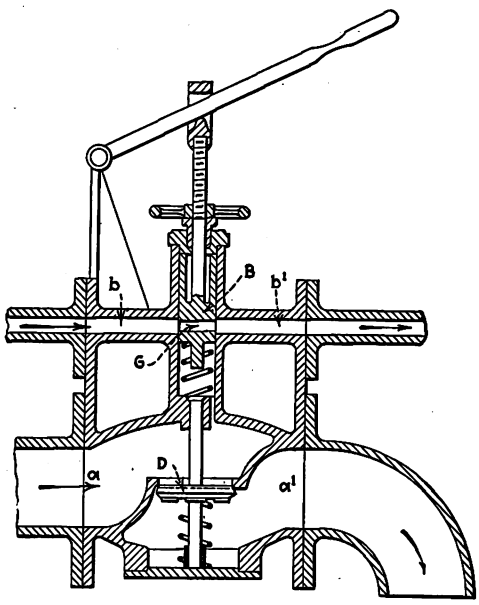

Fig. 3—Safety cut-off on discharge piping

The exhaust from the gasoline engine operating the compressor, when it is running in normal operation, has been found by chemical analysis to consist of 85 per cent nitrogen, 13 per cent CO_2 and 2 per cent CO. The proportion of free oxygen contained in this mixture is so very small that it is practically negligible and the gas so obtained has been found absolutely inert when care is taken to keep the operation of the motor normal. The care thus required is to avoid in the exhaust either an excess of air, which would increase the proportion of oxygen, or an excess of gasoline, which would increase the proportion of CO. This is the inert gas, after it has been purified, which is used to be in contact with the fuel in the fuel reservoirs, and piping.

Process of Purifying the Gas

The method of purifying the gas is shown in Fig. 5. After leaving the motor the exhaust gas first passes into the cleanser, *D*. Here it passes through water and in cooling leaves behind the greater part of any water vapor it may have contained. It then passes through the pipe *d* to the compressor *C*, which forces it through the pipe *g* into the second cleanser, *G*. This cleanser is similar in construction to cleanser *D*. Here it leaves the last traces of its water vapor. Then it passes through a filter, *H*,

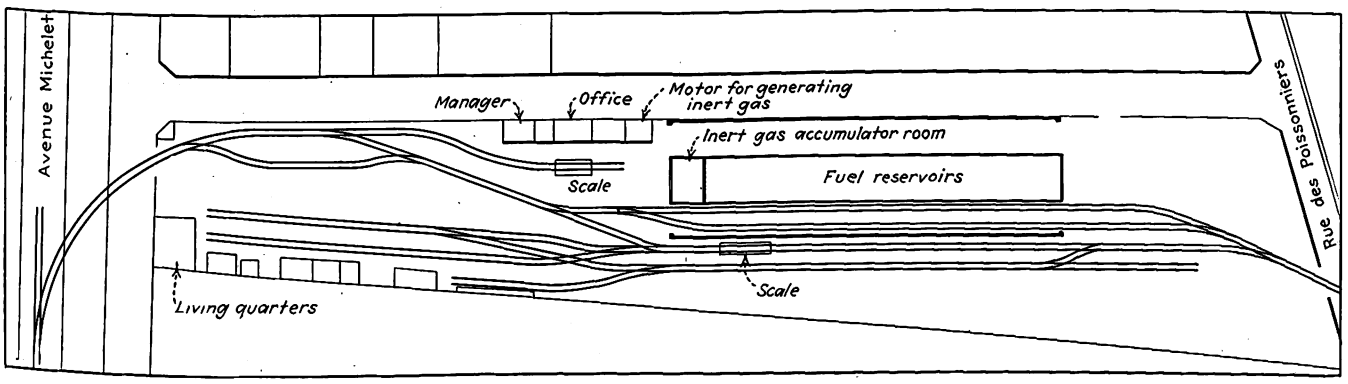

Fig. 4—Plan of central storage area showing position of buildings and switch tracks

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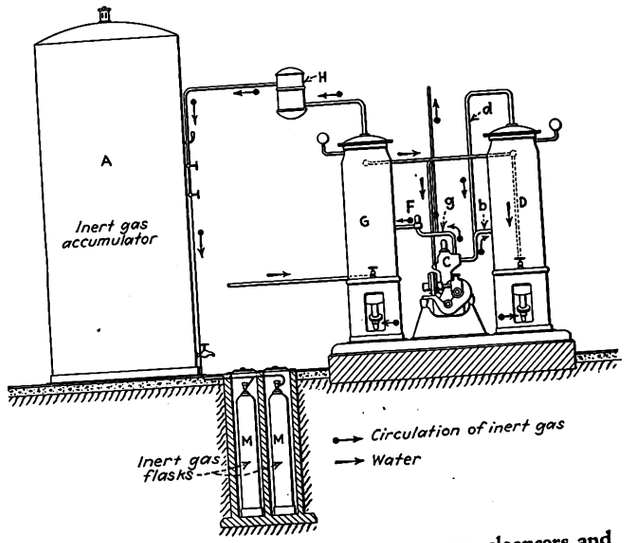

Fig. 5—Vertical elevation of inert gas pump, cleansers and accumulator

into the main gas accumulator, or it can be stored in smaller receptacles at *M*.

Between the force pump and the cleanser *G* is an automatic pressure regulator, *F*, by which the work imposed on the compressor is kept constant. The purpose of this regulator is to provide that in the event of two consecutive failures of ignition in the driving motor there will be no danger that a mixture containing any inflammable gas will pass over into the inert gas accumulator. Should there be such an ignition failure, the power of the motor falls off and it is unable to overcome the resistance provided through the pressure regulator; hence, the motor stops. This action is made more certain by the use on the motor of a very light flywheel. Finally, a cut-out on the motor exhaust pipe allows the motor to discharge its exhaust into the atmosphere for a short time after it has started running. In this way the cylinders are cleared of any air or unburned fuel before the exhaust is led to the inert gas accumulator.

At the plant described 25,000 tons of liquid fuel are passed in and out each year.

Inert Gas Supply at Local Garages Also

The same system of fuel protection by inert gas is used in the local garages as in the main storage supply, although the equipment is not as complex or extensive as that at the central storage plant. But it is as complete so far as protection from accidental combustion is concerned.

The plan of the S.T.C.R.P. Montrouge garage, Fig. 6, shows a typical Paris garage layout. This garage has a total area of 70,203 sq.ft. and a covered area of 56,484 sq.ft. Its maximum capacity is 108 standard buses and its normal operating capacity is 104 buses. In one corner, as will be noticed, are the living quarters of the depot superintendent and his two assistants. This is a feature of all of the omnibus garages in Paris. In this case the housing quarters contain offices on the ground floor and living quarters for a family on each of the three stories above the ground floor.

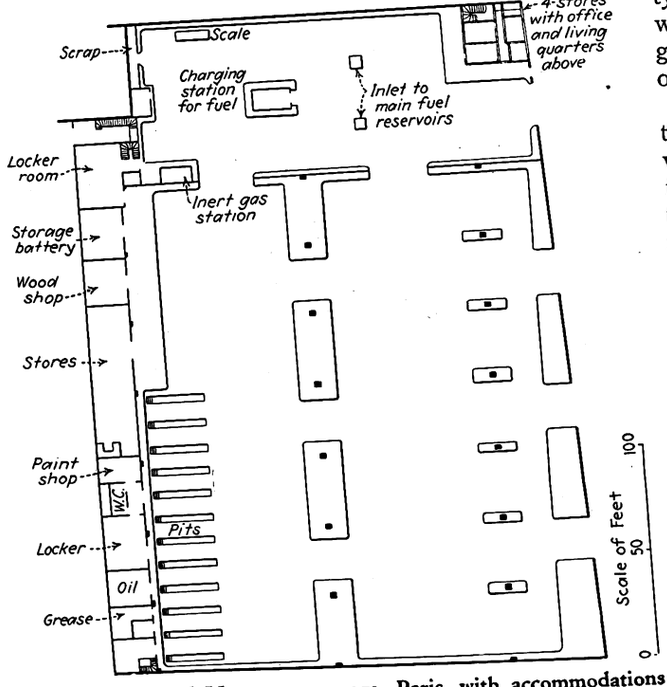

Fig. 6—Plan of Montrouge garage, Paris, with accommodations for 108 buses maximum and 104 buses normal. Like all other garages of the S.T.C.R.P., this one has an inert gas outfit for protecting the fuel supply from accidental combustion

Glasgow Adopts Double-truck Tramcars

This Scottish city has purchased for its municipal system 50 cars involving many changes from standard British design. Experimental changes are also being made on six of the older cars

FIFTY new type tramcars are soon to be installed by the Glasgow Tramways, Glasgow, Scotland. At the annual inspection of the corporation's car works by the Tramways Committee on Oct. 13 samples of the new type car, as well as several types of reconditioned cars, were examined. In all of these the objects aimed at are greater speed and greater comfort for the passengers in order to meet bus competition.

The lower deck of the new car is finished in teakwood, the ceiling covered with embossed paper and painted white. This deck seats 30 passengers. Twelve are cared for by six cross seats in the center, three on each side of the aisle. Sixteen passengers are seated in the longitudinal seats at each end. The body width externally has been increased by 5 in., but by introducing a specially reinforced side pillar the inside width of this deck is increased 9 in.

The upper deck is also finished in teakwood, the ceiling covered with ply-wood and painted white. The top deck is completely inclosed. A partition and folding doors are fitted around the stairhead to prevent draughts passing through. All seats face forward except four, where the passengers sit with their backs to the staircase. Two single seats in the center permit passengers to pass each other in comfort. Ten lamps of 40 cp. each are fitted in the upper saloon and eight in the lower.

The body is mounted on two bogies of the maximum traction type, thus departing radically from the former Glasgow standard four-wheeled car. The driving wheels have a diameter of 27 in. and the pony wheels 22 in. The wheelbase of the body is 4 ft. 2 in. and the distance between bogie centers 13 ft. 6 in. Each of the 50 new

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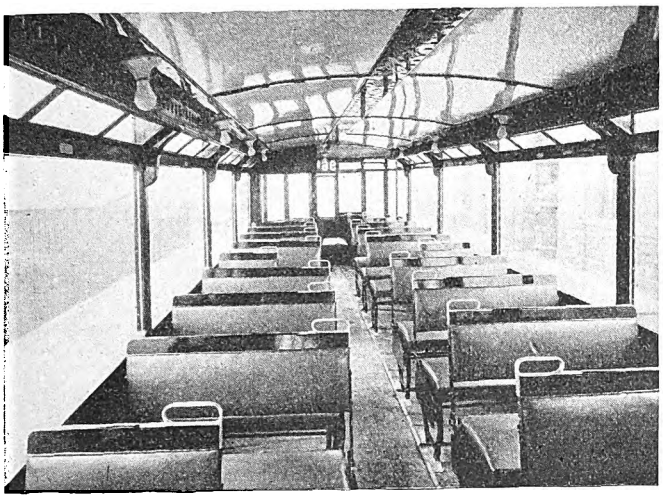
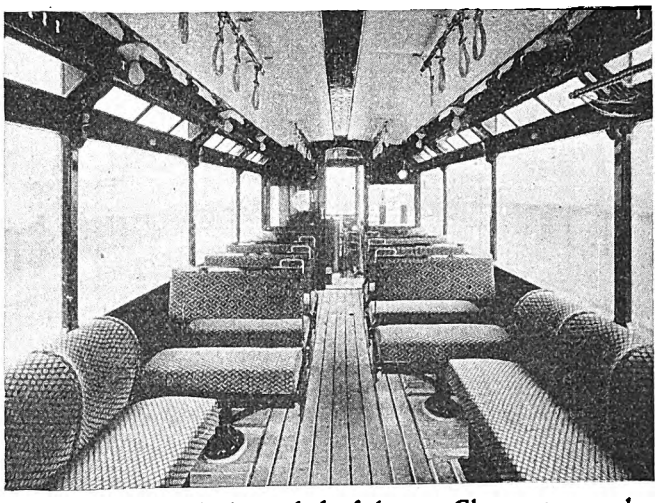


The upper decks of the Glasgow cars are entirely inclosed. This is also an innovation in British design



By careful design the lower deck of the new Glasgow tramcar has an interior 9 in. wider than in the previous cars

cars has two 50-hp. light-weight ventilated motors with contactor controllers.

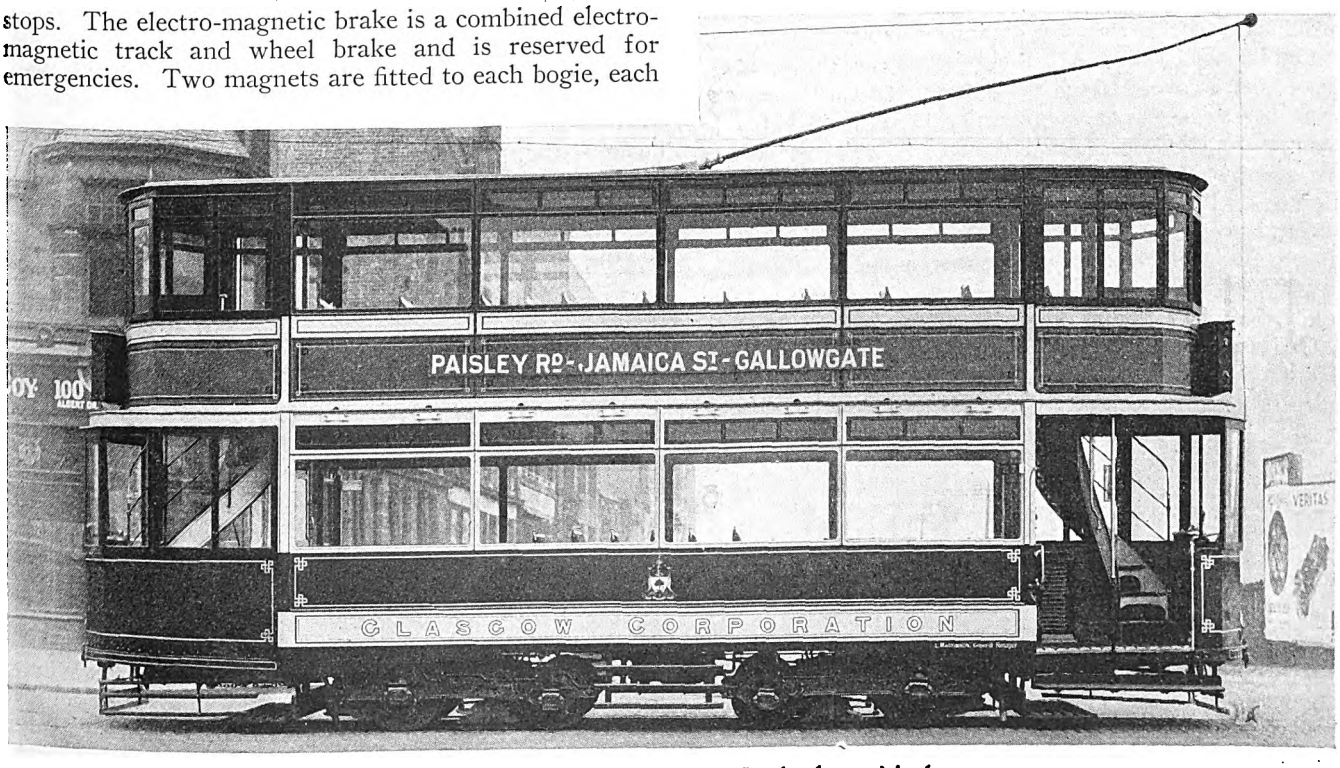
The car is equipped with hand, air and electro-magnetic brakes. The air brake, which operates the hand brake gear, relieving the motorman of the physical strain of braking by hand, will be used exclusively for service stops. The electro-magnetic brake is a combined electro-magnetic track and wheel brake and is reserved for emergencies. Two magnets are fitted to each bogie, each being capable of exerting a vertical pull on the rails of 2 tons. On each platform there is installed a simple cock which will set the air brake when opened. By this means the brakes can be set and the car stopped, either by conductor or passenger. On the driver's air brake handle is a trigger which opens an air-valve when depressed and forces sand under the wheels.

New Car		Old Car
20 ft. 6 in.	Length of body	17 ft. 0 in.
6 ft. 0 in.	Length of platform	6 ft. 0 in.
33 ft. 0 in.	Length over platform angles	29 ft. 6 in.
7 ft. 2 in.	Width of body over panels	6 ft. 9 in.
7 ft. 3 in.	Width of body over molding	6 ft. 10 in.
6 ft. 10 in.	Width inside lower saloon	6 ft. 1 in.
6 ft. 10½ in.	Width inside upper saloon	6 ft. 8 in.
6 ft. 3 in.	Height of lower saloon	6 ft. 4½ in.
6 ft. 0 in.	Height of upper saloon	6 ft. 1¾ in.
2 ft. 7 in.	Height of car floor from rail	2 ft. 8 in.
15 ft. 10½ in.	Height over all from rail	16 ft. 2½ in.
30	seats, lower saloon	24
38	seats, upper saloon	38
68	Total seats	62

The combined destination and route indicator is mounted over the lower canopy, the destination letters being 5½ in. deep and the route letters 4½ in. deep. Under the top canopy the route number is shown in figures 6½ in. deep. This is a distinct advance on the present type of destination indicator.

Exterior and interior views of the car are shown in the accompanying illustrations.

The principal dimensions of the new car compared with the former standards are given in the accompanying table.



The first of 50 new cars for the Glasgow, Scotland, municipal tramway. These are the first double-truck cars to be used on the property

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Car Tickets at One-Third Off

Discount allowed by Atlanta grocery store to customers who return bread wrappers— Tickets also sold through druggists

HOUSEHOLDERS in Atlanta are being offered a novel inducement to purchase loaves of bread made by the Southern Grocery Company. This organization owns 150 grocery stores, known as Rogers' Stores, in Atlanta and surrounding territory. Beginning Jan. 1 it has been giving an Atlanta street car ticket for two returned bread wrappers and five cents, or two car tickets for four bread wrappers and 10 cents, etc. As the car ticket sells for 7½ cents (or two for 15 cents), this means a reduction of one-third on all tickets or else 1¼ cents for each bread wrapper returned, which ever way the transaction is figured.

Dash sign carried on Atlanta cars to advertise sale of tickets at chain grocery stores

The grocery company gets no reduced rate for tickets bought from the railway company operating in Atlanta, the Georgia Power Company. It pays 7½ cents for each ticket obtained. The only consideration which it received was that at the beginning of the sale the railway company advanced to the grocery store $1,500 worth of tickets. This number the stores replenish daily for cash. At the end of the campaign the stores will naturally account to the railway company for the $1,500 worth of tickets advanced at the beginning of the sale. In addition, the company carried a dash sign for a few days reading "Street car tickets on sale at all Rogers stores." A reproduction of this sign accompanies this article.

On its part, the stores, beside the special offer mentioned, have agreed to sell tickets to anyone at the rate of four for 30 cents or in multiples thereof, to carry in their store windows a card reading "Street car tickets for sale here" and to advertise in the daily papers their plan of exchanging bread wrappers for car tickets.

Car tickets are also on sale at the company's office, the starter's office, company stores, a chain of private drugstores and at another large store. They are also sold by conductors and one-man car operators.

On Jan. 30 the store proprietors reported that during the month their sales of bread had increased 400 per cent since the campaign was started and that they considered the plan highly successful.

Up to this time the principal outlet for tickets outside of the cars and the company's office was through a chain of fifteen drugstores in Atlanta, known as the Jacobs' stores. The only expense to which the railway company is put in connection with the sale of these tickets is to carry a dash sign occasionally on its cars, similar to that illustrated but reading "Use car tickets. On sale at Jacobs' stores."

On its part the drug company in its principal downtown store, which is at a busy intersection, has posted in a conspicuous place an illuminated car destination sign to indicate the route of approaching cars. It is operated by a colored porter in front of the store who pushes the appropriate button when any car comes in sight, thus apprising the store patrons of the fact. The accompanying view shows the position of this sign and how the arrivals are indicated. The cost of the sign and its running expenses are defrayed by the drug company.

A popular drug store in Atlanta operates a car route sign for the benefit of its patrons

In a recent interview with a representative of the ELECTRIC RAILWAY JOURNAL, the manager of the drug company said that the illuminated sign and dash car card on the railway company's cars were considered excellent advertisements. The effect of the sign was to induce street car patrons to utilize the store as a sort of waiting room, especially on rainy or sultry days. This is considered an advantage because in looking around the store they undoubtedly saw and bought articles that they would not have come in to purchase. While unable to estimate the extent to which the plan had increased the business the management stated that no doubt the additional amount so obtained more than repaid the investment and maintenance cost of the sign.

These two outlets for tickets are considered advantageous by the company because they relieve the conductors and one-man car operators from selling tickets.

New Carhouse and Housing Plans in Turin, Italy

CONSTRUCTION of a new carhouse to accommodate about 300 cars has just been finished by the municipal electric railway at Turin, Italy. Adjoining the carhouse is a track yard which will be served by a bridge traveling-crane with a span of about 48 ft. Adjoining the track yard, in turn, is an apartment building, being erected to house the employees operating from this depot. This housing undertaking has 430 rooms, divided into apartments of different sizes.

The Turin electric railway system has grown rapidly during the past twenty years and in 1927 had a total of 555 cars. The passengers carried in 1927 were 203,322,000.

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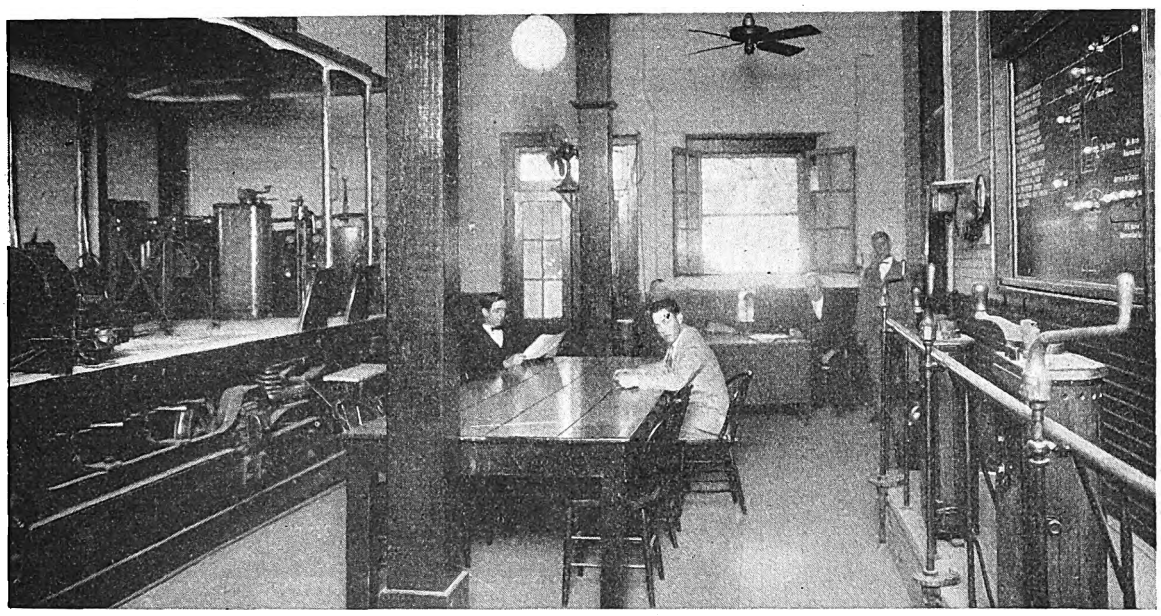


Training school of the New Orleans Public Service, Inc., showing the school car, the controller platform and the electric circuit board

Well-Trained Motormen Create Good Will

Co-operation between the instruction department and the rolling stock and shops department of the New Orleans Public Service aids in training motormen

By E. J. Murphy

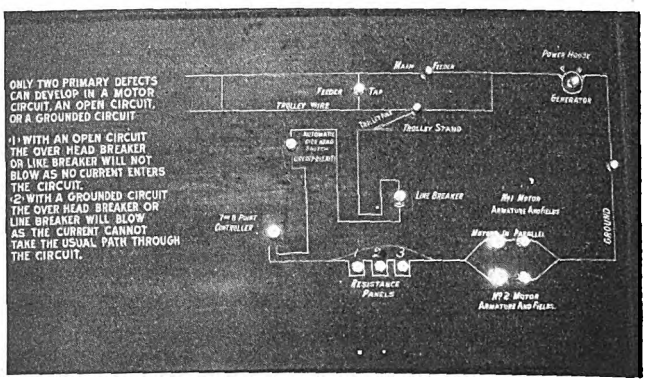
Superintendent of Instruction and Employment
New Orleans Public Service, Inc., New Orleans, La.

This article gives details of the instruction methods of this company, which has made a remarkable record of freedom from failures. It is based on a paper presented by the author at the meeting of the Electric Railway Association of Equipment Men, Southern Properties, held at New Orleans on Jan. 25-27, and supplements information published in this paper for Aug. 2, 1924.—EDITOR.

GOOD equipment and well-trained operators mean good service to the public, as well as increased earning power for the company. As practical electric traction men, we understand in a general way what a pull-in of a defective car means, particularly during the peak; the havoc it creates in headway, causing patrons to wait an unnecessary length of time to board a car, and also the disarranging of schedules. This kind of service does not help build a good public relationship, which today is a matter of vital importance.

Frequently after an investigation of a defective car pull-in, causing a long delay, some trivial defect was found the cause of all the trouble and very easily could have been eliminated had the motormen been trained properly. In 1921, with this problem still unsolved, we decided to make every reasonable effort in New Orleans to decrease our defective car pull-ins, and with this object in view our motormen were checked in the operation of their cars.

The training school was established and all new men entering the service were instructed thoroughly in locating and eliminating nominal defects, and shown the path of the current through the electrical apparatus of the car



An electric board is used in explaining the electrical circuit and defects which develop in the circuit. The motors can be shown either in series or in parallel

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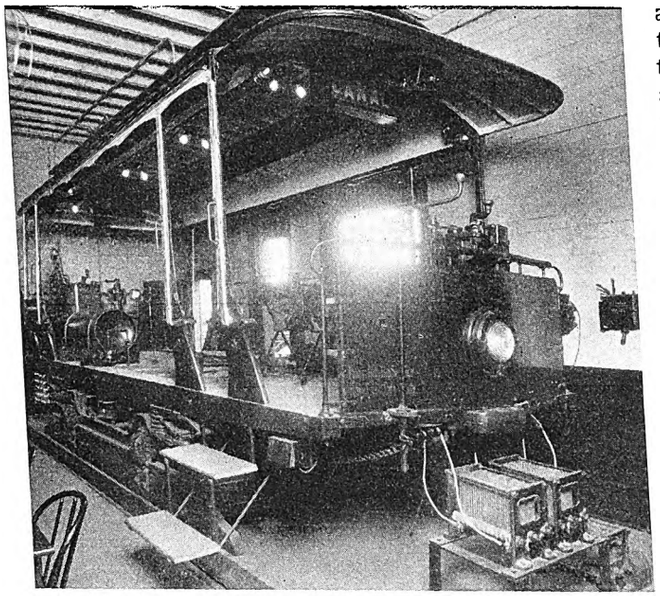


The school car, fully equipped for operation, is mounted on a stationary platform. Note how all equipment is exposed

by competent instructors. The improvement noticed in the handling of the electrical equipment by new operators became so noticeable that we decided to bring in all our regular motormen on the company's time to train them the same as new men. The response to this request was remarkable. Many of our old motormen willingly grasped the opportunity to learn more of the equipment they were handling. During this period we found 75 per cent of the old men in need of such instruction. The result has been a source of satisfaction. The initial cost has been amply repaid to the treasury in competent operators and first-class equipment.

Co-operation of Departments a Helpful Factor

Our superintendent of rolling stock and shops and his men have co-operated to the fullest extent in our efforts to improve our operators. At various times he has made new installations in the training school. Whenever a new device is installed in the electrical equipment of the cars in service a similar device is installed immediately at the training school. A great deal of our success in training men can be attributed to the good feeling existing between the two departments.

A definite course of instruction is followed in training the motormen. New employees enter the training school the morning after being accepted by our medical examiner for employment. The students are then taken in hand by one of the instructors at the training school and told the company's policy to the public and to the employees. Particular stress is laid on courtesy, cleanliness, loyalty and honesty. The talk is supplemented by reading copies furnished by the superintendent of transportation of a number of commendatory letters from patrons received by trainmen already in our service. Although this instruction requires but one-half hour, the students acquire a good idea of the policy of the company concerning their duties as motormen, a very important part of which is to make every passenger satisfied.

After this instruction, the students are assigned to a stationary platform equipped with one type K-36-J and two type K-11 car controllers. Here they are trained to handle the controllers. Four rows of five lamps each are connected to one of the K-11 controllers to illustrate the functioning of the resistance. On the first point, the entire cluster of lamps is illuminated, indicating that all the resistance is in the circuit. The lamps are extinguished by rows until in the running position, the lamps are all extinguished, showing the starting resistance is no longer in the circuit.

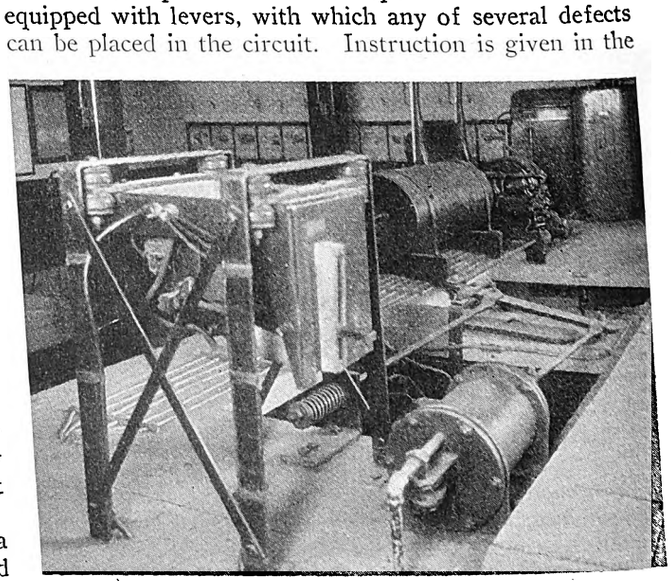
Electric Board Shows Complete Trolley Circuit

The course of the electric current from the power house through a car and return is explained next to the class. For this purpose an electric board shows by lamps and heavy white lines the several parts of the circuit. The board measures 3x7 ft. and is mounted on the wall in plain view. The flow of the current is traced from the generator at the power plant through the main feeder, feeder taps, trolley wire, trolley wheel, trolley pole, trolley base, trolley lead, automatic line breaker, overhead circuit breaker, controller, resistance, motors in series or in parallel, motor ground leads and the rails back to the power house. Each unit of the electric apparatus is illuminated by small lamps controlled by switches handled by the instructor.

Following the electric board instruction the students are assigned to the school car, an old stationary car, fully equipped. The car has a K-68-A controller on one end and a K-35-JJ on the other. The resistance is an ordinary grid resistance and is supported on a stand on the floor, with all wiring in plain view. The resistance can be grounded or open-circuited by the instructor at will. The air equipment is mounted upon the floor of the car where its operation can be explained and observed more easily. A d.c. voltmeter on the side of the car is used in the discussion of line voltage. An ammeter is used also to show the difference in the current required with proper and improper handling of the controller.

All parts of air-brake equipment are explained fully while the car is in motion.

Each student is stationed on the platform of the car and given further instructions in handling the controllers and the air valves. This trial operation takes place with the car entirely clear of defects. The instructor then opens or grounds a part of the circuit and requests the student to repeat his former operation. The car is equipped with levers, with which any of several defects can be placed in the circuit. Instruction is given in the



The air-brake equipment is mounted upon the floor of the car and can be inspected easily

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method of locating the trouble and making the necessary repairs. As many as three or four defects are thrown in the circuit at one time and the student is expected to discover them.

After the preliminary instruction each student is assigned to a platform instructor and is expected to operate cars on various lines. During the entire period, usually fourteen to eighteen days, he is followed up by a representative of the instruction department.

The student is expected also to return each day to the instruction department for further study in preparation for the final examination, which is conducted by the superintendent of instruction. It includes the locating and repairing of all defects. If the student passes, he is assigned to the station and his name placed on the extra board. Thirty days later he is sent back to the training school by the station master to take a written examination of 81 questions pertaining to his work. He then is followed up constantly for 60 days by three road inspectors or follow-up men, who make reports on his progress in the handling of cars.

Steel Bridge Replaces One of Concrete

REPLACEMENT of a concrete arch bridge with a 114-ft. steel bridge weighing 100 tons was the difficult and unusual task just finished by the Portland-Lewiston interurban division of the Central Maine Power Company. The new bridge was placed in position during the interval between the time the last car went over the old bridge at midnight Wednesday night, Dec. 14, and daylight the next morning. Work of lowering the heavy structure into place continued through the day and the first car passed over the steel at 2:20 in the afternoon.

The only semblance of inconvenience to passengers was for a few hours during the morning when they were transferred from the cars around by bus. By noontime approaches to the bridge had been built on an incline to serve as a temporary track while the old concrete bridge below was being blasted out and the new steel dropped finally into its permanent resting place.

Although concrete is ordinarily replacing steel in modern bridge work, the reversal of that custom in this instance is due partly to extraordinary conditions which resulted in the acid-bearing waters of the Presumpscot River causing unusual decomposition of the concrete during the seventeen years of its existence.

A feature of the engineering work was the moving of the steel bridge, mounted on two standard gage railroad car trucks, from the siding about 2 miles away, where it was completely assembled, to the river site. It was necessary to proceed slowly because clearance of the telegraph poles on the side of the roadbed was scarcely enough to allow the huge "car" to pass. The trip took one hour and ten minutes.

No difficulty was encountered in setting the new bridge into place. The trucks were run across the old concrete bridge and after the ends had been jacked up and the trucks removed the span was dropped down on the temporary abutments which had been prepared for it. A temporary supporting arch had been placed under the bridge to guard against possible accident until the new span could be set up. Preparations for replacing the bridge had been made for three weeks. The work was done under the direction of the Sanders Engineering Company and Webster & Libby, consulting engineers.

Effect of Unsprung Car Weight on Track Wear

Berlin Surface Lines measures vibrations produced at rail joints and crossings by cars with motors having different kinds of mountings

EFFECTS of reduction of unsprung weight on rail wear, particularly at joints and in special work, in connection with electric cars equipped with bevel gear drive, have been studied by the Berlin, Germany, Surface Lines, which operates a number of such cars. Measurements were made with a vibration meter to determine the extent of the blows delivered by the wheels of cars of about the same total weight but with different

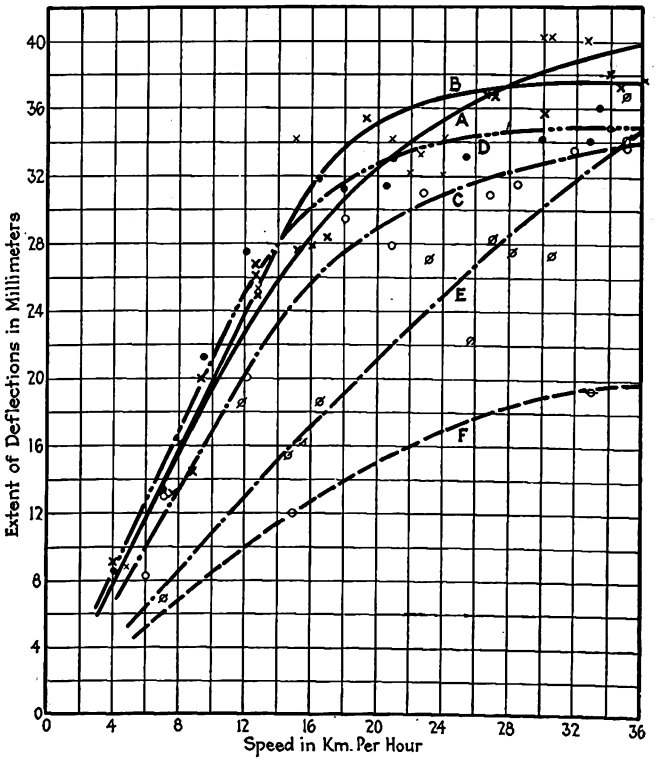

Chart showing the geometrically added deflections in the direction of the three components (vertical and two horizontal) for various cars at various speeds, viz.: A, axle-suspended motor car, empty; B, same with 500 kg. extra unsprung weight; C, beveled-gear motor car, empty; D, same with 3,000 kg. regular load; E, maximum-traction truck car; F, four-wheel trail car

proportions of unsprung weight. The results are given in an article by Ph. Kramer, one of the engineers of the Berlin Surface Lines, and published in the issue of Jan. 28, 1928, of the *Zeitschrift des V.d.I.*

The tests were made by operating cars of different types across an electric railway over steam railroad crossing. The electric railway rails at this point are flange-bearing, so the electric car wheels run on their flanges up to the point where the groove in the steam railroad rail occurs. Here the electric railway wheels, which were of 28.4 in. diameter, in passing over the steam railroad groove with a width of 1.57 in., were able theoretically to drop a maximum of 0.006 in.

The cars tested were of the following types:

1. A single-truck car with motors suspended in the usual way from the axles. The weight of the car empty

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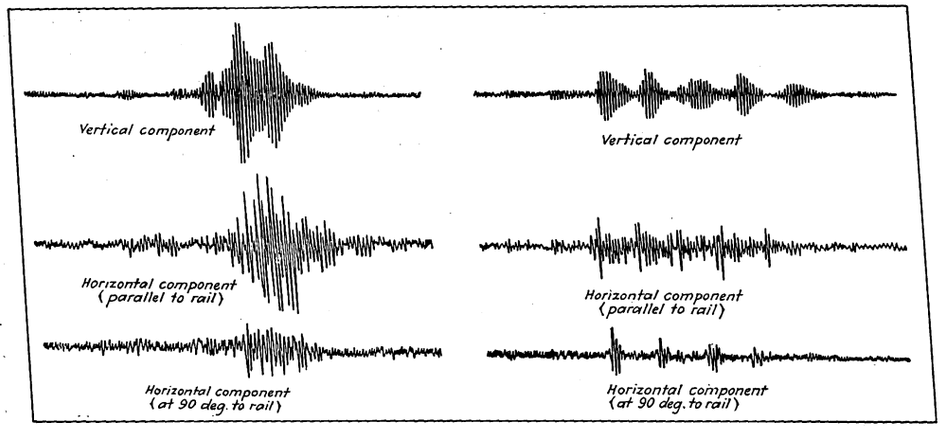

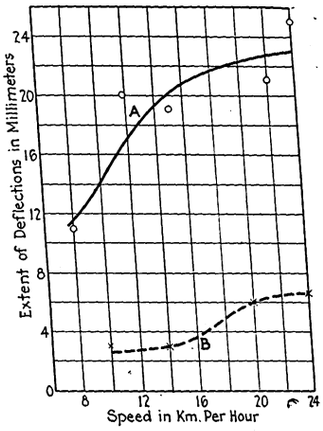

At the left are reproductions of typical records obtained with the vibration meter when a car passed over the crossing. The three at the extreme left were made with the car traveling at 27 km. (17 miles) an hour and the second group with the car traveling at 8.8 km. (5½ miles) an hour. The chart at the extreme right gives a comparison of the blows on the motor when (A) it is supported on the axle and (B) when it is fully spring supported and equipped with bevel gear.

was 24,640 lb.; the gear ratio was 1:5.92; unsprung weight per axle, 2,486 lb.; wheel diameter, 28.4 in.; wheelbase, 9 ft. 2 in.

2. A car similar in type, spring support, etc., to the one just mentioned, but with spring-supported motor and bevel gear with double reduction. The gear ratio was 1:6.03 and the total weight was 26,114 lb., of which the unsprung weight, including gear cases and axle journals, was 2,182 lb. per axle. The wheel diameters and wheelbase were the same as in the first car.

3. A car mounted on two maximum traction trucks drawing an empty four-wheel trailer. The data of the maximum traction truck car were: wheelbase, 51 in.; truck base, 18 ft.; wheel diameters, 31½ in. and 22 in.; total weight 33,880 lb. The trailer data were: total weight, 15,400 lb.; wheel diameter, 28.4 in.; wheelbase, 9 ft. 2 in.; unsprung weight, 1,320 lb. per axle.

The vibration meter, which was somewhat similar in design to a seismograph, registered the vibrations in a vertical and in two horizontal directions. The diagram on page 403 shows the result of a number of readings in which the ordinates are the geometrical sum of the vibrations in the three different directions (vertical and two horizontal), measured in millimeters, and the abscissas are the speeds in kilometers per hour. Tests were made with both loaded and empty cars, as shown in the table. It will be seen from the tests with empty cars that the car with bevel drive caused less vibration than the one with axle suspended motors, and with loaded cars this was the case for speeds of more than 7¾ miles (12½ km.) per hour.

Up to speeds of 21¼ miles (34 km.) per hour, the double-truck car caused considerably less vibration then either of the others, though the number of blows was, of course, twice that of the four-wheel cars. The trailer naturally gave the most favorable results. The data of the cars tested are presented in the accompanying table.

DATA OF CARS TESTED

Type of Car	Total Weight—Metric Tons	Total Weight—Pounds	Unsprung Weight Per Axle—Kilograms	Unsprung Weight Per Axle—Pounds
Car with axle suspended motors	11.2	24,640	1,380	2,486
Car with axle suspended motors and 500 kg. extra unsprung weight	11.7	25,740	1,380	3,036
Car with beveled gear motors	11.87	26,114	992	2,182
Car with beveled gear motors with 3 tons load	14.87	32,714	992	2,182
Maximum traction car	15.4	33,880	....	....
Trail car with four wheels	7	15,400	600	1,320

One great merit claimed for the spring support of the motors is that it reduces the shock to the motors themselves, as compared with the method of supporting one end of the motors on the axles. Tests to determine the extent of these blows were also made in conjunction with the State Railway Department, with a somewhat different type of machine. The cars were the same two four-wheel cars used in the other tests and were operated over the same crossing. The curves reproduced show greatly reduced shocks on the car with spring supported motors, as compared with a car in which the motors were sleeved on the axles.

$1,956,600 Stock Sold by Virginia Company in One Day

OFFERING for sale nearly $2,000,000 of its 6 per cent cumulative preferred stock on one day last September and selling entirely by the close of business the same day was the unique experience of the Virginia Electric & Power Company, Richmond, Va. "A week before," writes A. H. Herrmann, director of public relations, "we had offered our employees the opportunity to take as much of the issue as they wanted and, based upon past campaigns in which they had subscribed to about 1,700 shares, we fixed the quota this year at 2,000. Their actual subscription totals 2,127 shares."

As remarkable as was the success of this sale, it was not achieved without some lively work on the part of officials in the matter of extensive publicity, both through the mails and through newspaper, car and bus advertising mediums. Under date of Sept. 17, President W. E. Wood, in one of his regular letters, offered stockholders the opportunity to absorb some of the new issue, prefacing the offer with the following statements:

We have now completed the high-power transmission line extension from Suffolk into Elizabeth City, Hertford and Edenton, N. C. We have also completed other extensions into northeastern North Carolina, whereby we have added to our service a number of additional towns and, incidentally, many new customers. The latest towns to be added include Rich Square, Ahoskie, Winton, Aulander, Severn, Milwaukee and a number of others. At this writing we are nearing completion of the extensive addition made to our Reeves Avenue steam power station in Norfolk, at a cost of about $5,000,000.

The co-ordination of our street railway and motor bus transportation in the several cities served is working out most satis-

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Newspaper "ammunition" used by Virginia Electric & Power Company in stock-selling campaign

factorily and the new buses and street cars purchased have added greatly to improving and popularizing our service. You will also be interested to know that we have just formed a new Benefit Association for our employees. This in place of the former Relief Association. The new association is larger in scope than the old one in that it also includes all employee welfare activities, whereas the former association was confined to the payment of sick and death benefits. These benefits under the new plan are just about doubled. The new association will be of great service to our employees and will be the means of promoting still further the already very excellent *esprit de corps* in our company.

Through the confidence and co-operation of those whom we serve the Virginia Electric & Power Company during the two years under Stone & Webster management has spent approximately $20,000,000 in providing, improving and expanding its facilities in Virginia and northeastern North Carolina. Thus, we are continuously making additional expenditures for further improvements and expansion.

Being a stockholder in our company, you will be interested in the additional issue of $1,965,600 of 6 per cent cumulative preferred stock which our company is now offering to its employees, its customers and the citizens of tidewater Virginia and northeastern North Carolina, and this letter is sent you inviting your participation with us in our plans for further expansion to meet the greater demand for our service in this growing territory.

In the newspaper advertising, of which there are reproductions on this page, purchasers, both employee and otherwise, were given the privilege of buying the stock on the installment plan at $7.50 as the initial payment and $10 per month installments. With a par value of $100, those buying the stock outright and making payment as of Sept. 20 acquired the shares at $97.50. The proceeds from the stock sale are to be used in increased service throughout the company's territory and for additions and betterments.

Safety Practice Shows Results in St. Louis

STREET cars in St. Louis, Mo., were involved in 1,675 fewer accidents in 1927 than in the previous year, according to a report made to the St. Louis Safety Council by the St. Louis Public Service Company. Accidents in 1927 totaled 17,097, the lowest for any one year since 1920. In 1920 there were only 61,782 motor vehicles in St. Louis compared with about three times that total now.

The average number of car-miles per accident was 2,450 in St. Louis compared with 2,380 for 57 street railway lines reporting to the American Electric Railway Association.

Collisions between street cars totaled 229 in 1927 and 312 in 1926, and collisions with motor vehicles 9,606 against 10,526 in the previous year. Collisions between street cars and pedestrians number 368 compared with 485 in 1926.

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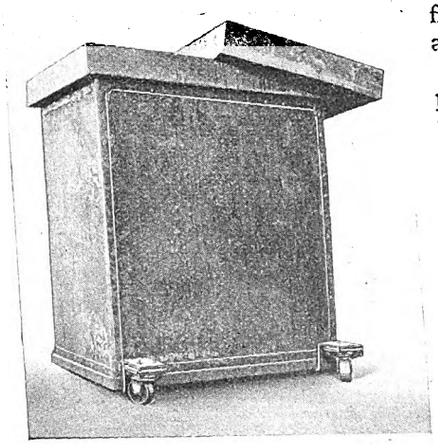
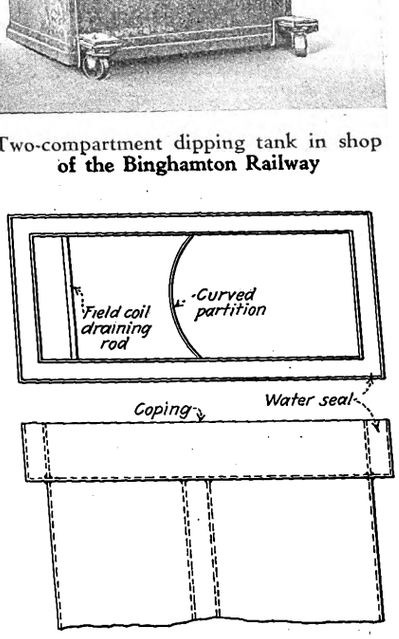
Maintenance Methods and Devices

Two-Compartment Portable Dipping Tank

WHERE lifting facilities are limited it is advantageous to have a portable dipping tank which can be transported to the chain hoist to deposit or remove an armature and then be returned to its place of storage. It was found necessary to construct such a tank in the shop of the Binghamton Railway, Binghamton, N. Y. This tank is made of $\frac{1}{8}$-in. sheet iron which is welded to 1-in. angles. It is 36 in. long, 23 in. wide and 42 in. high. It is mounted on two $\frac{3}{8}$-in. x $3\frac{1}{2}$-in. flat bars, each end of which is fitted with a swivel wheel 3 in. diameter and 1 in. face.



Two-compartment dipping tank in shop of the Binghamton Railway



Construction details of tank

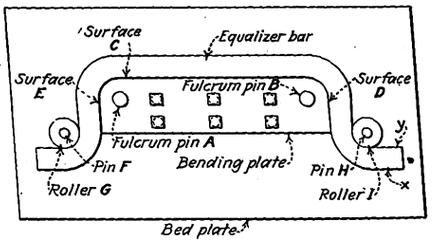
The tank is constructed with a No. 16 galvanized iron coping $3\frac{3}{4}$ in. high, which projects $1\frac{3}{4}$ in. on all sides. This coping is made with a double wall and the space is filled with water. The edges of the cover drop into the space, which acts as a heat seal for the cover. The tank is divided into two parts by a curved iron sheet. The portion of the tank on the concave side of the partition is used for the dipping of armatures whereas the other section is used for the dipping of fields. This permits the use of one grade of varnish for the fields and another grade for the armatures at the same time.

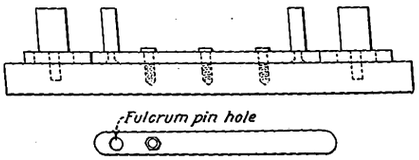
The field coils are drained by suspending from a $\frac{3}{4}$-in. round rod fastened across the top of the field compartment. The armature is drained by suspending on a chain hoist over the armature compartment.

Equalizer Bar Bending Form

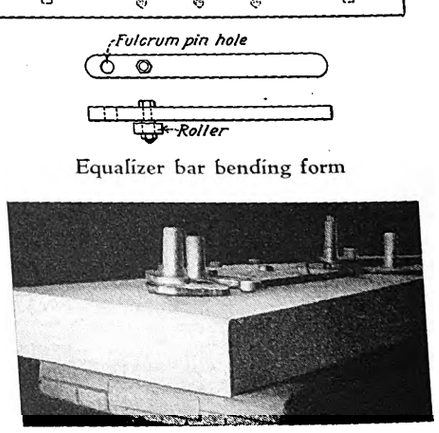
BENDING of equalizing bars so that all surfaces are parallel is done in a bending form designed and constructed in the Woodside shop of the New York & Queens County Railway, Long Island City, New York. This was designed by Thomas V. Campbell, superintendent of maintenance for Fisk & Roberts, managers of the property. The radii are identical and the distances between the curve centers are the same on all bars. Considerable trouble was experienced in making the bars symmetrically before this form was put in service. The form consists of a bed plate, form plate, radius rollers, and fulcrum pins. The cast-iron bed plate is 2 ft. wide, 6 ft. long and 6 in. thick. A $\frac{7}{8}$-in. plate, 10 in. wide and of the correct length is bolted to the center of the bed plate, and the upper corners are rounded for the desired radius. Two 2-in. x $4\frac{3}{8}$-in. steel pins are riveted on either end of the plate, and are used as fulcrum centers for the shaping bar shown in the sketch. A movable 2-in. x 4-in. pin installed at a predetermined distance from either end of the form plate, and designed with a $3\frac{1}{4}$-in. roller, obtains a proper radius on the short end of the bar.

The hot bar is clamped to the bed plate in close contact with surface *C* of the form plate while the radius pins *F* and *H* are removed. The bar is then sledged toward both ends of the form plate. The shaping bar is then slipped on the fulcrum pins *A* and *B* alternately and is given a rotary motion to permit the rollers to give the outer surface the correct radius. Pins *F* and *H* are then reinstalled, and the ends of the bar are sledged upward against the rollers. Another shaping bar of a slightly different radius than the one used on pins *A* and *B* is used on pins *F* and *H* alternately to obtain the proper radius of the lower corners. The bar is then sledged downward on the bed plate to make the surfaces parallel. It is then removed from the form and the short end surfaces, *X* and *Y*, are paralleled on the bed plate surface.





Equalizer bar bending form



Details of bending form

One Man, Not Two

IN THE description of an oil heater for thawing frozen switches as used by the Toronto Transportation Commission and published in the Maintenance Data Sheet section of the JOURNAL for Feb. 18, the last sentence read "Only two men are required for operation." A feature of this device is that but one man is needed for successful working.

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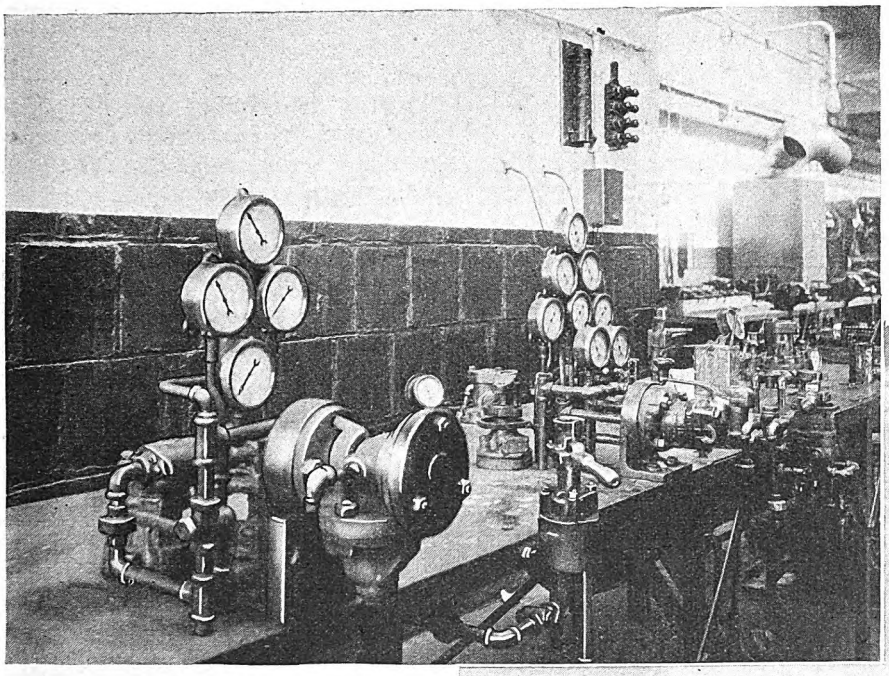
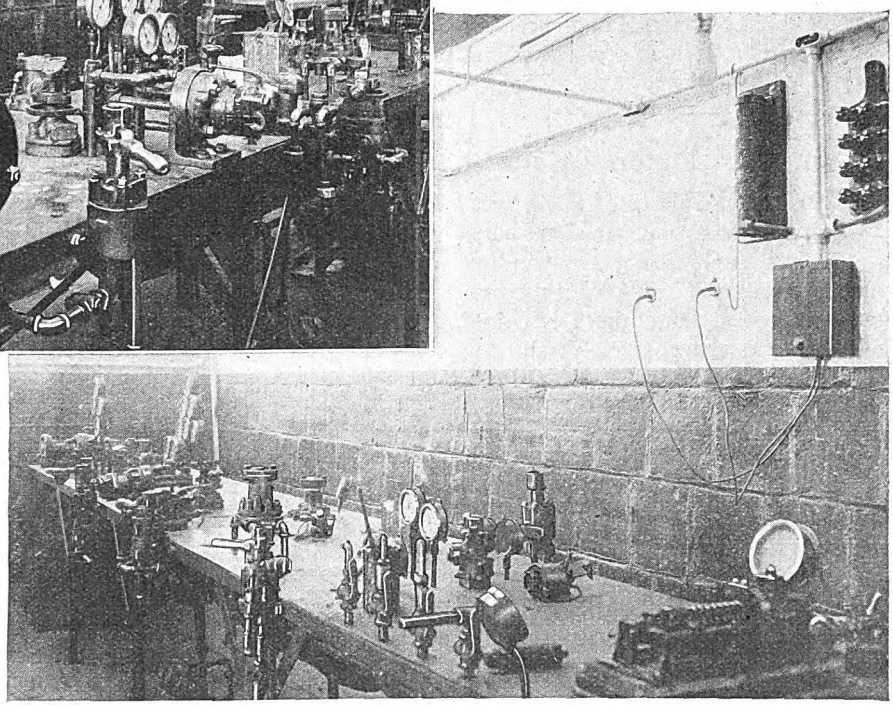
Careful Tests of Air Brake Equipment Insure Correct Operation

PROVISION for testing all the types of air brake equipment used on its cars is made by the Brooklyn-Manhattan Transit Corporation in its DeKalb Ave. surface repair shop. Cars coming into the shop for overhauling are stripped of all air brake equipment which is then sent to the air brake room for overhauling and testing. The first step for the air brake repairman is to take the equipment apart, wash it with kerosene and then blow it off with compressed air so that all ports and parts are cleaned thoroughly. The parts are then overhauled, after which all valves are put on the test bench and tested for leaks and to see that they operate properly. When found O. K., the valve is taken from the test bench and is ready to be put back on the car again.

Governors are cleaned, overhauled, tested for leaks and also readjusted. Compressors are cleaned and dismantled by the air brake repairman's helper and are then sent to the repairman, who overhauls them, after which they are given a good test before leaving the air brake room.

The test bench in the air brake room of the DeKalb Ave. surface repair shop is made for the following tests: motorman's operating valves, triple valves and emergency valves, foot valves, pilot valves, shut-off valves, double-check valves, air





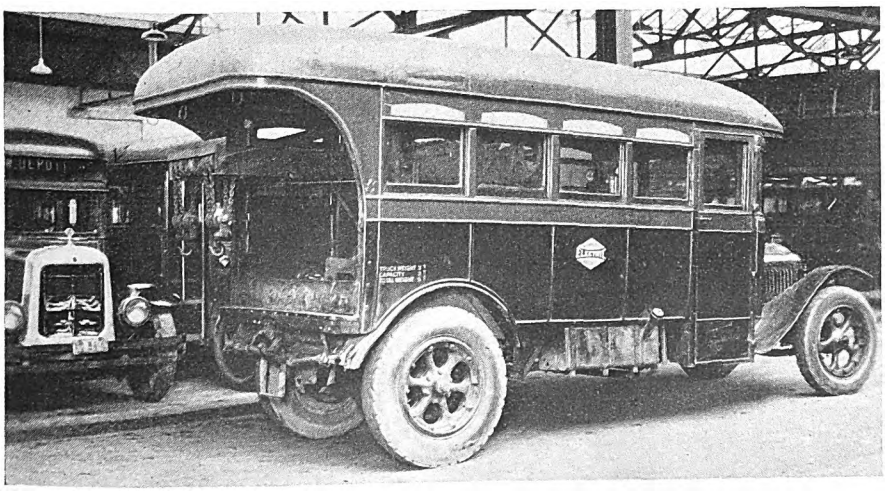
Two views of the air brake test bench in the B.-M.T. surface repair shop

Old Buses Utilized as Work Cars

PURSUING a policy of putting its older buses, which have been withdrawn from passenger service, to some practical purpose, the Milwaukee Electric Railway & Light Company, Milwaukee, Wis., has rebuilt in its own car shops a number of such vehicles as work trucks. The illustration shown below indicates what has been done in revamping one of these older buses for use as a wrecking car.

The rebuilt bus is equipped with a Manley crane installed on a sliding framework which permits its extension several feet out from the rear of the body. As shown, the crane can be pushed into the car where it is completely out of the way when not being used. Included in the mechanical equipment of the wrecker is a hand-operated winch. A number of compartments are built into the framework of the truck at accessible points. This permits carrying a fairly comprehensive set of tools and supplies with which to facilitate the work to which the truck may be put in an emergency.

Systematic repairs — increase fares.



Milwaukee rebuilds buses such as this for use as service trucks

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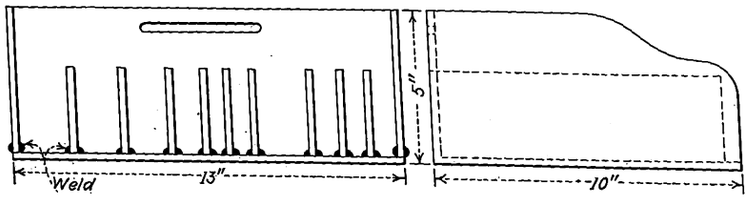


Rack for holding miscellaneous armature winding material

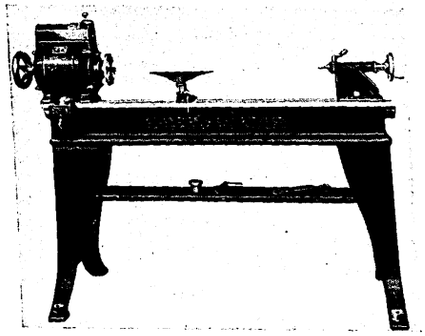
gages, governors, slack adjusters, door engines, all kinds of cocks, safety valves, conductor emergency valves, circuit-breaker cylinders and door engine magnet valves.

Armature Material Rack

MANY small pieces of fiber, mica, and similar materials are constantly required during the winding of an armature. Where this material is not at hand there is a loss of time and the cost of production is increased. This is not all. Where provisions are not made for the proper care of this material much of it finds its way to the floor and is swept out. This has been overcome in the armature room of the Binghamton Railway, Binghamton, N.Y., where a rack constructed for such material is placed within easy reach of the worker. This receptacle is an open-partitioned box, made of No. 16 gage galvanized iron. It is 13 in. long, 5 in. high and 10 in. wide. All of the parts are acetylene welded. A hole in the back sheet provides a convenient means for carrying.

New Equipment Available

Lathe Equipped with Multiple Speed Motor



Speed lathe with direct-connected motor

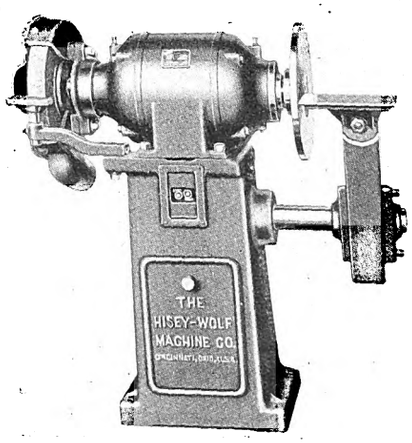
MULTIPLE speed control with a Union motor built in the head of a speed lathe is announced by Gallmeyer and Livingston, Grand Rapids, Mich. The multi-speed ball bearing motor of ½-hp. capacity provides for spindle speeds of from 570 to 3,450 r.p.m. The machine handles work up to 12 in. diameter over the bed and up to 9½ in. over the tool rest. Heavy cast legs provide a rigid support to the bed, eliminating vibration. A shelf is located below the bed in a convenient position.

These speed lathes are equipped with a rigid tailstock which may be located in position or released by a half turn of a special wrench furnished with the machine. The $1\frac{5}{16}$-in. tailstock spindle is bored to a No. 2 Morse taper. Adjustments are made by means of a hand wheel conveniently located, and the spindle is held rigidly in place by a quarter turn of a lever.

The tool rest is adjustable vertically and swings at any desired angle. The rest may be moved to any point on the bed and locked in the desired setting.

Combination Disk and Floor-Stand Grinder

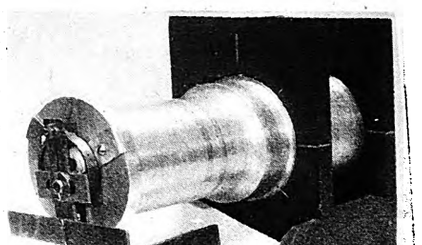
FLOOR-STAND grinders arranged with a combination disk are announced by the Hisey-Wolf Machine Company, Cincinnati, Ohio. The spindle is mounted on two ball bearings which take radial load only. A double-acting, self-aligning thrust bearing is provided to take all end thrust. The spindle, made of special tough steel, is of extra heavy construction, and a work table 8¼ in. x 9½ in. is standard equipment.



New combination grinder

Splash Lubrication for Car Journals

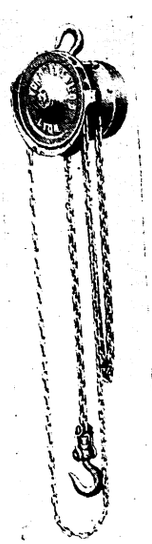
SPLASH lubrication of car journals is the purpose of a device announced by the Hinge Car-Axle Oiler, Toledo, Ohio. It is intended to take the place of the waste and oil arrangement of present journal boxes. The splash oiling arrangement attaches to the end of the car axle and dips into the oil placed in the ordinary type journal box. An arm raises the oil and spreads it on the axle as it rotates, thus keeping the bearing supplied with lubricant.



Splash oiling device attached to end of car journal

Chain for Lifting Heavy Loads

ELECTRICALLY welded chain of high carbon content is announced by the Ford Chain Block Company for its Triploc hoist. Each link is proof tested with special instruments. When the chain is assembled, it is tested again to make certain that it has strength of more than 50 per cent above its rated capacity. Hoists are built in capacities from ¼ to 20 tons. The chain must have great strength and ability to withstand wear, and must not stretch to any extent under heavy load.



High-carbon electrically welded chain fitted to Ford Triploc hoist

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Association Activities

Uniform Vehicle Code Urged

DISTRIBUTION has just been made of the address on the uniform vehicle code made by A. B. Barber, manager transportation and communication department, Chamber of Commerce of the United States, before the Illuminating Engineering Society on Jan. 11. Colonel Barber points out the extent to which the automobile with defective brakes, lights or other essential equipment is not disclosed by any available statistics. He is of the opinion that many accidents charged to recklessness or inattentive driving really are due to faulty maintenance. As an indication of this he points to the large number of vehicles that may be observed with defective head lighting equipment observable anywhere on any night.

In order to reduce the accident toll and to bring about betterment of traffic conditions there are three lines of approach: (1) provision and maintenance of adequate facilities, which embraces the highway and the vehicle; (2) education in the safe and proper use of the facilities, and (3) exercise of public authority in the administration and enforcement of laws and regulations governing such use.

The third of these means of traffic improvement, Colonel Barber points out, is being furthered in preparation of the uniform vehicle code. This is one of the principal results of the 2½ years of work of the National Conference on Street and Highway Safety. The code as finally completed has been endorsed by the American Bar Association. The code is having rapid acceptance, considering that it was only completed in August, 1926. Outside of the North Atlantic region, which already had systems of automobile administration substantially as provided for in the code, some ten states took favorable action in 1927. Three other states adopted modifications.

A point of special importance is that of clearance lamps on trucks, buses and trailers having a width in excess of 80 in. The code requires one such lamp with a white light located at the front and another with a yellow or red light located at the rear, both on the left side of the vehicle. Serious accidents have occurred due to failure to maintain such lights, and similar accidents have resulted from absence of tail lights on smaller vehicles.

Beside the uniform code work on a model municipal traffic ordinance is in progress. Secretary Hoover last summer appointed a committee, of which William E. Metzger of Detroit is chairman, to study and report on this question. The work has been divided into six subjects, as follows: (1) Vehicle movement and registration; (2) pedestrian facilities and regulation; (3) traffic signs, signals and markings; (4) parking, garages, terminals, loading facilities and street obstructions; (5) public motor vehicles, railroads, street cars and emergency vehicles; (6) traffic organization and enforcement. Each of these subjects was assigned to a subcommittee. As a result a tentative draft of a model ordinance has been drawn up and will shortly be given widespread distribution for public criticism and suggestion.

Central Master Mechanics to Meet in Erie

ERIE, PA., has been selected as the next meeting place by the Central Electric Railway Master Mechanics Association. The sessions will be held on May 9 and 10.

New England Club to Meet in Springfield March 22

SPRINGFIELD'S experimental car and the results developing from its actual use during a period of months in city service will be described by W. L. Harwood, engineer of power and equipment Springfield Street Railway and Worcester Consolidated Street Railway, at the March meeting of the New England Street Railway Club to be held in Hotel Kimball, Springfield, Mass., on March 22. Treadle door operation, particularly with respect to the Springfield and Worcester cars, will be the subject of a paper by J. H. Van der Veer, sales engineer of the National Pneumatic Company, New York. These papers will feature the afternoon session, to open at 3:30 o'clock. They will be illustrated with motion pictures and slides and will be followed by general discussion.

Howard F. Fritch, Massachusetts, vice-president of the club, will preside at the afternoon meeting and also at the dinner, which is set for 6:30.

E. G. Buckland, vice-president of the New York, New Haven & Hartford Railroad, will speak at the dinner. His subject will be "Co-ordination of Transportation in New England." Other speakers will be Capt. Ralph Earle, U. S. N., retired, president Worcester Polytechnic Institute, and Robert Burlen, Boston. The toastmaster will be Major Frederick J. Hillman, executive vice-president of the Springfield Chamber of Commerce.

During the dinner there will be an entertainment by the Fisk Time-to-Retire Boys and Orchestra in person, sent directly from New York.

The program for the meeting is arranged by the Springfield and Worcester companies under the supervision of Clark V. Wood, president of the companies.

Transportation will be provided by Springfield Street Railway buses for club members arriving by the Boston & Albany and New York, New Haven & Hartford Railroads between 11:45 a.m. and 5:25 p.m., these buses operating between the Liberty Street side of the Union Station and Hotel Kimball.

COMING MEETINGS OF *Electric Railway and Allied Associations*

March 13-15—Oklahoma Utilities Association, annual convention, Tulsa, Okla.

March 14-15 — Illinois Electric Railway Association, Springfield, Ill.

March 21-22 — Central Electric Traffic Association, Seelbach Hotel, Louisville, Ky.

March 22—New England Street Railway Club, Springfield, Mass.

March 23—Maryland Utilities Association, annual meeting, Emerson Hotel, Baltimore, Md.

March 30—Executive Committee American Electric Railway Association, 292 Madison Avenue, New York, N. Y.

April 6 — Metropolitan Section, A.E.R.A., 39 W. 39th Street, New York, N. Y.

April 26-28—Missouri Association of Public Utilities, Jefferson City, Mo.

May 2-5—Southwestern Public Service Association, Dallas, Texas.

May 6-12—Union Internationale de Tramways, de Chemins de Fer d'Interet Local et de Transports Publics Automobiles, biennial meeting, Rome, Italy.

May 9-10—Central Electric Railway Master Mechanics' Association, Erie, Pa.

June 6-8—Canadian Electric Railway Association, annual convention and exhibits, Toronto, Canada.

June 20-27 — American Railway Association, Div. 5—Mechanical (including former activities of the Master Car Builders' Association and the American Railway Master Mechanics' Association), annual convention and exhibit, Atlantic City, N. J.

June 21-22 — American Railway Association, Motor Transport Division, Atlantic City, N. J.

June 28-29—Central Electric Railway Association, Cedar Point, Ohio.

July 8-12—Public Utilities Advertising Association and International Advertising Exposition, Detroit, Mich.

July 25-27—Electric Railway Association of Equipment Men, Southern Properties, Cincinnati, Ohio.

July 27-28—Central Electric Railway Accountants' Association, Detroit, Mich.

SEPT. 22-28, 1928

American Electric Railway Association, 47th annual convention and exhibit, Cleveland, Ohio.

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News of the Industry

Lower Rates on Pacific Northwest Traction

Reduced rates between Seattle, Wash., and Vancouver, B. C., were put into effect on March 1, by the Pacific Northwest Traction Company and are good on either interurban coaches or buses. With the beginning of the new rates, the company will double its service between Seattle and Vancouver, making four return trips instead of two as at present. The new rate will be $1.95 one way to Seattle, compared with $3, the former rate; the return rate will be $3.65 against the old rate of $4.65; between Bellingham and Vancouver, the new rate is $1.50 one way, against $2.15, the old fare, and a round trip charge of $2.25 compared with $3.65 formerly charged. The fares provide first-class passenger observation coaches, with full baggage allowance, and a full 30-day limit. Proportionate reductions for towns en route are announced.

John Hickok, railway superintendent, states that a further attraction will be offered in the reduction of running time.

Columbus City Council Revives Rail-Light Franchise

The Columbus, Ohio, City Council voted unanimously on March 5 to reopen franchise negotiations with the Columbus Railway, Power & Light Company. Members of the Council went into the reasons for the resumption of the negotiations at this time. The 25-year franchise with the Columbus company expired in 1926. Negotiations were broken off a year and a half ago by the company when it refused to accept the draft of the revised ordinance after it had been approved by the Council. The company considered certain terms as proposed at that time not to be in line with the trend of similar grants made in recent years.

Patronage Increases in Rochester's Subway

An increase of 11 per cent in February over January in passenger traffic of Rochester's new $12,000,000 subway in the bed of the abandoned Erie Canal is shown in the report made public by James F. Hamilton, president of the New York State Railways, which operates the line. The underground trains carried 106,730 passengers in February and 95,840 in the preceding month. Part of this gain is accounted for by the starting of service on the west side of the railroad and by the diversion of Rochester, Lockport & Buffalo interurban cars into the subway during the month.

High speed schedules are not yet possible because of incomplete feeder installation and repairs to be made to the roadbed. By April 15, President Hamilton told the ELECTRIC RAILWAY JOURNAL representative, it is expected that the railways will be able to give the public of Rochester real high speed service over the 8 miles of subway railroad from the suburb of Brighton on the east to the western limits of the city and through the heart of the downtown section.

Under terms of a proposal submitted March 5 to the Interstate Commerce Commission, the Buffalo, Rochester & Pittsburgh Railroad will extend service over the 9-mile line of the subway railroad located entirely in the city of Rochester. The subway is owned by the city.

The existing contract between the railroad and the city provides for the interchange of traffic and for payment by the railroad of costs of haulage over the subway lines. By the new arrangements, the Buffalo, Rochester & Pittsburgh will be enabled to deliver and receive shipments direct from important industrial establishments.

New York Company Firm

Interborough refuses to budge from its determination not to treat with Amalgamated. President Hedley in letter to Mayor indicates company's position

STATEMENT and counter-statement have followed fast from both sides in the case involving the issues between the Interborough Rapid Transit Company, New York, and the Amalgamated which early in the week threatened an immediate strike. The union's official explanation of its failure to call a strike on Tuesday night to protect men alleged to have been discharged on account of their Amalgamated affiliation was that it did not "intend to be made the tool of the Interborough management in a campaign for a 7-cent fare," and that the company was trying to compel the strike for the purposes of strategy.

On March 2 Mr. Mahon addressed a letter to the Mayor, which, except for its salutation, follows:

Some 21 men have been discharged for seemingly no other reason than having joined the Amalgamated Association. In addition to that the company is preparing to lock out all members of the association. This is evident from the fact that the company is equipping its shops with bedding, cooking utensils and other paraphernalia to take care of strike breakers and employing strike breakers. This, of course, is exciting the employees who are members of the Amalgamated Association.

I think you know that the Amalgamated Association is desirous of seeing this matter brought to a speedy and satisfactory settlement without any strike or disturbances, and on the part of the Amalgamated Association I am hereby making suggestions that, if carried out, will bring about a settlement without any disturbances or interruption of work.

You stated to us in the conference this morning that the company had claimed to you that the 21 men were dismissed not for joining the Amalgamated Association but because of other reasons. On the part of the Amalgamated Association we believe, and the 21 men were told, that they were discharged for no other reason than that they were members of the association.

I therefore suggest that the company agree to submit the question of the discharge of all these men to you, as the Mayor of the city of New York, or to the Transit Commission of the city of New York, and that all the facts in connection with their suspension or discharge be submitted to you or to the Transit Commission of the city of New York by representatives of both sides, and if the men have been discharged or suspended because of their membership in the Amalgamated Association that they be reinstated and paid for the time they have lost. That during the time these matters are being considered by you or the Transit Commission the company cease hiring strike breakers and remove the strike breakers from its properties.

I assure you the Amalgamated Association will abide by your decision or the decision of the Transit Commission on these matters. We expect the company should agree to this plan by Tuesday evening, March 6.

The position of the company in the matter is made plain in the letter of President Hedley of the Interborough to Mayor Walker dated March 6. It was in reply to Mr. Mahon's letter. Mr. Hedley said in part:

Our discussion was amicable and I think I am warranted in saying that your affability went a long way to inspire in everybody the desire to discover a reasonable basis for action which might avert a strike. A plan was devised for an examination by our law department into the facts upon which the Brotherhood had acted in expelling certain employees, thereby causing their suspension by the management pending an investigation to satisfy the company whether there was just cause for such expulsion. The Brotherhood members had assured you that the men had been expelled not only because they had become members of the Amalgamated Association contrary to their pledge to their Brotherhood and their agreement with the company, but because in addition they had been guilty of

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stirring up strife through bad language and disorderly conduct towards their fellow employees. You were assured that if any injustice had been done it would be righted. You seemed to have confidence in the good intentions of everybody to that effect. Upon leaving your office steps were taken at once to carry out the program suggested.

However, it seems that the Amalgamated Association was not content to let the Mayor of the city proceed in his own way to avert a strike. That association insisted that it be made a party to the proceedings as a condition of withholding its threatened strike. That insistence entirely changes the situation. No suggestion that the Amalgamated should supervise the proceedings was made at our meeting with your Honor. But that is the demand of Mr. Mahon in addition to undertaking to dictate what this company must do about hiring new men.

Mr. Mahon's letter refers to a "dispute" between his association and this company. There is no such dispute.

This company does not recognize any right on the part of Mr. Mahon or of the Amalgamated Association to represent any employees of the company. Therefore, no attention will be paid to any of his suggestions about procedure. Nor will this company cease hiring new men (called strikebreakers by Mr. Mahon) or remove such newly hired men from its properties at the demand of Mr. Mahon or of his association.

On the contrary every effort will be made by us to maintain a reserve force of competent men to take the places of such employees as may be dismissed or are persuaded to strike, or "get beyond the control" of the Amalgamated leaders, or leave the service for any reason whatever. We intend to continue to take every precaution to see that the public suffers as little as possible from the efforts of the Amalgamated organization once more to disrupt our service.

For your information I desire to say that we have carefully looked into the cases of the men who were expelled. In each case there was evidence of misconduct of the character related to your Honor. I have no confidence in the further usefulness of those men and it is my intention to dismiss them from our service. We must respectfully decline to permit any further supervision of our relations with our employees by outside parties.

I cannot be responsible to the public for the safe operation of our railroads unless I am left with a free hand to determine what kind of employees shall be depended upon for such safety.

We desire to avoid trouble, but we do not intend to purchase peace at the price of permitting the Amalgamated Association any longer to keep our working forces in a state of turmoil. The attention of our men upon whose carefulness the safety of the public depends must not be distracted by the agitation fomented by the Amalgamated people.

I trust that it will be plain to your Honor and to the public from the letter of Mr. Mahon that what he and his followers are seeking is domination and control over our employees. The Court of Appeals has decided that this company "may refuse to employ workers who will not accept a condition or make an agreement that they will not join a particular union or combination of workers while in the plaintiff's employ."

The Amalgamated has sought unsuccessfully to break down that legal right through agitation, strikes and threats of strikes for the last twenty-three years, during which time our loyal employees have rendered safe service to the public. All they ask now is to be let alone.

I desire to avert a strike which, as I have heretofore stated, may bankrupt the company, but I cannot safely operate this property partly Amalgamated and partly Brotherhood.

I thank you for your very fair conduct of this matter at all times and assure you of my great regret that I can see no other course to take.

A statement by the Brotherhood said in part:

The Amalgamated Association is threatening to call a strike on the Interborough lines.

At a special meeting of the general committee held this date, the executive committee was directed by resolution to notify every member of the Brotherhood that any employee who answers a call to strike will never again be admitted to membership in our organization, which means he cannot be re-employed by the Interborough Rapid Transit Company.

The Brotherhood intends to live up to the preamble of our constitution, which guarantees to the people of this city continuous, efficient railroad service.

Since Tuesday both sides have been marking time.

High-Speed Line Plan Before Milwaukee Council

Plans for the construction of Milwaukee's first subway, combined with an interurban service on private right-of-way were announced by S. B. Way, president of the Milwaukee Electric Railway & Light Company, and have been approved by the Mayor of Milwaukee and the Association of Commerce.

Mr. Way states that the company proposes to build a half-mile subway from the Public Service Building at Third and Michigan Streets to Eighth Street and St. Paul Avenue, to be connected with a new double-track system, partly elevated, tying in with its west-end rapid transit interurban lines at Fortieth Street. The entire length of the new system would be 2.8 miles. The cost of the project is estimated at $4,000,000.

The Common Council will consider the proposal at its next meeting. If approved, Mr. Way stated that construction work would begin as soon as possible.

The project has been reviewed at length in the issues of ELECTRIC RAILWAY JOURNAL for Feb. 25, page 311, and March 3, page 351.

Special Rates Continued in Tacoma

Another 90-day extension of the special street car rates in Tacoma, Wash., has been filed with the department of public works by the Tacoma Railway & Power Company, continuing the rates until June 4. The special rates provide for three tokens for 25 cents with universal transfer privilege and weekly passes for 30 cents entitling the holder to ride for 5 cents.

Negotiations for Wage Contract in Memphis

Wage scale differences between the management of the Memphis Street Railway, Memphis, Tenn., and 450 employees are being worked out in accordance with plans mentioned in the March 3 issue of ELECTRIC RAILWAY JOURNAL. From a week to ten days will be spent in hearing testimony.

The men are asking for an increase of 9½ cents an hour for operators on two-men cars and 20 cents an hour for operators of one-man cars. The company is asking for a flat reduction all down the line. A two-year contract on which the present arbitration is functioning expires April 1.

New York Learns About the Mitten Plan Through the "Sun"

The New York *Sun* sent a reporter to talk with Thomas E. Mitten and to study the workings of the Mitten Management Plan. The results of that talk and study were set forth in four articles the first of which appeared in that paper on March 6. The series was announced by the *Sun* in an editorial headed "Can Philadelphia Teach Us?" as follows:

Sixteen years ago the transit lines of Philadelphia were in ruins. Strikes had impoverished the company, angered the men and antagonized the public. Bankruptcy was in plain sight. Then Thomas E. Mitten took charge to put into effect an idea—to take the workers into partnership with capital—make them allies instead of opponents in operating a public utility. He sought to set the men at work for their own prosperity.

Today Philadelphia's transit workers are paid more than any others in the United States. A stock once nearly worthless sells considerably above par. Dividends of 8 per cent are paid annually on the common stock. The Philadelphia public boasts about the service it has through a co-ordinated system of trolley cars, subway, elevated roads, motor buses and taxicabs.

Another study of Mr. Mitten was published in the New York *World* of March 8, 1928, under a heading "Trends in Industry."

Franchise Extension for Dallas Interurban

An extension until Dec. 31, 1928, of the franchise of the Dallas Southwestern Railway has been granted by the City Commission of Dallas, Tex. This company was organized several years ago for the purpose of constructing an interurban electric railway between Dallas and Irving. E. P. Turner is president and chief promoter of the project. The line would proceed through the West Dallas industrial district to Irving, about 15 miles.

Several times the company has been ready to proceed with construction and each time some difficulty arose to hinder it. Officials are convinced that they will be able to complete the line during the present year. Upon this representation city officials extended the franchise.

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Would Increase Rate on Washington Line

An increase from 20 to 25 cents for a round trip fare on its line from the Treasury to the golf course, and Hains Point in East Potomac Park, has been sought by the Capital Traction Company, Washington, D. C., of the office of public buildings and public parks of Washington. Lieut. Col. U. S. Grant, 3rd, director of the office, said that it had been represented to him that the line was losing money, and that he did not want to see transportation facilities to that large recreation area abandoned on account of the losses. In his opinion, the increase was a reasonable one, amounting to less than 5 cents a mile for the 5½-mile round trip.

Another Franchise Extension in Chicago

Another day to day extension of the franchises of the Chicago Surface Lines, Chicago, Ill., was approved by the City Council on Feb. 29, as the fifth successive extension of the street car franchises expired. Like the previous extensions, the new one is on a day-to-day basis and not to exceed 31 days.

Active Welfare Work in New Jersey

How far the Public Service system, Newark, N. J., goes in administering comfort to its approximately 20,000 employees is outlined in a special article in the Feb. 15 issue of *Public Service News,* the official publication of the company. The Welfare Department has a well-defined duty to call upon those disabled, carrying a message of the company's interest, making pecuniary advances when necessary, bringing the case to the attention of a physician, arranging for admission to hospitals, sanitariums or state institutions, and attending to many other matters which the exigency of the case may require. Special emphasis is laid upon the prompt and full payment of benefits, cases of illness falling under the Welfare Plan for the payment of sick relief and cases of injury being cared for under the state workmen's compensation act.

A service annuity or pension is provided, the terms of which are so liberal that one may retire at the age of 65, after 25 years of service, upon a competence virtually amounting to half pay, while provision is made for those who become broken in health after being 12½ years in the employ of the company.

In addition the Public Service creates for the employee an estate through the welfare plan death benefit and the group insurance and further by compliance with the workmen's compensation act when death is the result of industrial mishap.

It was explained that with these forms of protection, Public Service workers are assured of the equivalent of an estate fully administered and sufficient to carry the family over the adjustment period to the time when the economic status of the household becomes again firmly established.

L. S. Storrs Criticizes 5-Cent Zone Plan for Key System

Called as an expert witness by the Key System Transit Company at a fare hearing before Railroad Commissioner Clyde Seavey in San Francisco, Cal., Lucius S. Storrs, managing director of the American Electric Railway Association, characterized the proposed 5-cent zone plan for the East Bay cities as a hazardous experiment unless backed by a large treasury surplus. Mr. Storrs said the basic cash fare rate of a majority of American electric railways was 10 cents and he knew of no instance where a company had increased its net revenue by reducing the basic cash fare. The hearing was a resumption of the rate case which started last November when the Key System appealed the California Railroad Commission's 5-cent zone order, claiming that its effect would be bankruptcy.

Mr. Storrs took sharp issue with A. G. Mott, chief engineer of the commission and author of the 5-cent zone plan. Mr. Mott had testified that the 10-cent cash fare and $1 weekly pass plan of the company would result in the loss of 75 per cent of the company's short riders. To which Mr. Storrs' rejoinder was that he could not see what justification Mr. Mott had for saying that 75 per cent or 21,200,000 short haul passengers would be lost by operation of the plan. He opined that not more than 5 per cent of short riders would be lost. R. T. Sullivan, manager of the Tacoma Railway & Power Company, another expert witness called by the company, testified that a higher fare would raise net revenues even though there was a falling off in patronage.

The final session of the hearing will be held March 16 in San Francisco.

Rearrangement of Stops Asked in Atlanta

A rearrangement of street car stops in Atlanta, Ga., to eliminate stops in the middle of the block is being asked by the North Boulevard Park Civic League of the Georgia Power Company and the matter has been taken to the Georgia Public Service Commission.

According to statements by the league officials, many of the stops are now located in the middle of the block, and away from street corners. These stops, they declare, often make "jay walking" compulsory if one is to catch a street car, and are very dangerous to children because of the heavy and rapid traffic at many of the stops as now located.

They favor the elimination of these stops in favor of those at street corners.

Relief for Rainier Valley Line

The City Council of Seattle, Wash., has passed a bill modifying the railway franchises of the Seattle & Rainier Valley Railway, relieving that company of future payments of 2 per cent gross earnings tax and of furnishing free transportation to policemen and firemen. The bill was introduced in the Council last December, about the time the arrangement was made whereby the Rainier Valley company agreed to honor transfers from the city lines and to sell tokens on its lines at the same rate as charged by the city. The bill had been held up pending efforts of Councilmen to get the railway to pave between its tracks on Rainier Avenue. Representation by Walter M. Brown that the company could see no time when it would be financially able to meet the costs of paving caused the Council to drop the attempt.

About $75,000 owed to the city as back earnings taxes is being gradually wiped off the books through an agreement whereby patrons of the valley line are given transfers to municipal cars on token or 8⅓-cent fares.

New York Fare Case Put Over

Supreme Court Justice Callahan on March 2 adjourned until March 9 the hearing in connection with the three suits brought by the Transit Commission and the City of New York in the Supreme Court to restrain the Interborough Rapid Transit Company, New York, from putting 7-cent fare schedules into effect. The adjournment was granted at the request of E. D. Kyle, of the office of William L. Ransom, special counsel for the railway.

Baltimore Company's Vehicles to Aid Red Cross

The United Railways & Electric Company, Baltimore, has responded to a call sent out by the Baltimore Chapter of the American Red Cross and has offered that organization the use of a majority of its 110 passenger buses and 45 motor trucks in case of disaster in or near Baltimore. A Disaster Corps is being organized and the Red Cross is attempting to get truck and bus owners to offer the use of their vehicles.

St. Louis Prefers Pay-Enter

By a vote of 191,289 to 112,345 the patrons of the St. Louis Public Service Company, St. Louis, Mo., on Feb. 27 expressed a preference for the rear-entrance pay-as-you-enter system of collecting fares as against the present plant of front-entrance pay-as-you-leave. The vote was taken on the 949 cars of the old front and rear entrance type. A total of 1,129,189 passengers were carried during the day, but only 303,634 voted. Officials of the company said they would be guided by the vote.

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Rapid Transit for Cleveland

$40,000,000 System Being Discussed to Embrace High Speed Lines to All City Sections

Negotiations are under way between the Cleveland Railway, Cleveland, Ohio, and the Van Sweringen interests for a $40,000,000 rapid transit system tapping practically every section of Cleveland and the territory immediately adjacent.

O. P. and M. J. Van Sweringen are the developers of Shaker Heights, exclusive Cleveland suburb, and railroad operators and owners. They are now building a $60,000,000 railroad terminal in Cleveland, in connection with which they are planning rapid transit facilities.

They have asked the Cleveland Railway to submit propositions for the operation of five rapid transit lines radiating from their Public Square terminal. One is along the Nickel Plate right-of-way to the east, another is the existing rapid transit line to Shaker Heights, owned by the Van Sweringens and now operating partly on city tracks and partly on a private right-of-way, the third is along the right-of-way of the Erie Railroad to the southeast, the fourth is along the right-of-way of the Big Four Railroad to the southwest and the fifth is along the right-of-way of the Nickel Plate Railroad to the west.

One of Two Propositions Expected

The engineering firm of Coverdale & Colpitts has made a study of the situation for the Van Sweringens, while the firm of Parsons, Clapp, Brinkerhoff & Douglas is preparing a report for the Cleveland Railway, in which it is expected to make one of two propositions: (1) to lease the rights-of-way, lay the tracks, buy the necessary equipment and operate the rapid transit lines as part of the Cleveland Railway system, or (2) to offer to operate the rapid transit lines as a separate system on a cost plus basis.

Recently the Cleveland Railway concluded an agreement with the Van Sweringens to operate the existing Shaker Heights rapid transit lines on a cost plus 10 per cent basis. There are no transfer privileges between this line and the city car lines and the fare is 10 cents.

The projected rapid transit system will permit the abandonment of some street car lines and the shortening of others which are now losing money because of the length of the haul. New motor coach routes will have to be established to feed traffic into the rapid transit lines. The carrying out of the project will involve the purchase of millions of dollars worth of new equipment, including high speed trains, and must of necessity involve a mammoth grade crossing elimination program on the part of the railroads, particularly the Nickel Plate.

The survey being made by Parsons, Clapp, Brinkerhoff & Douglas started last August with traffic counts. Their report is due about April 1. It is expected to tell what effect the rapid transit lines will have on present electric railway and motor coach traffic, how many passengers can be expected to utilize the rapid transit lines at the start and their origin, what changes in routing of street cars and motor coaches can be made to best advantage, what type of rapid transit trains will be most suitable and what rate of fare ought to be charged.

Cleveland has been talking about rapid transportation for years, but the proposition now under consideration appears to be the first that can be worked out to give adequate service on a satisfactory cost basis. Ten years ago the city awarded a subway franchise to a group of capitalists and established a rapid transit commission which had power to make tax assessments, but the entire proposition was voted down at a referendum.

Tunney Rides the Trolley in Grand Rapids

Gene Tunney, world's heavyweight champion, paid the electric railway industry a very pretty compliment recently, while visiting in Grand Rapids to address 10,000 boys on living clean lives. As he was greeted by Martin C. Carmody, chairman of the reception committee and supreme knight of the Knights of Columbus, Gene said: "This is the first time I was ever met by a reception committee and escorted through the city in a street car. I feel complimented."

The mighty mauler of the heavyweight division was so pleased with the electric rail coach to be used as his private car that he requested a photo of himself standing beside it in company with Mr. Carmody. Noticing the Charles A. Coffin medal insignia gracing the side of the coach Mr. Tunney smiled and said: "You might call this picture 'When Three Champs Meet'."

"When Three Champs Meet"

Then Gene was escorted through the crowd from the Union station in his spic and span coach for his ride to the Pantlind Hotel. During the ride the champion commented on the soft seats, the refinements of the coach and the easy riding qualities. He then went into the smoking compartment where he stood and waved greetings to the throngs on the sidewalks. The car proved its superiority over other vehicles for such receptions since it permitted the entire reception committee to ride in ease and converse with their guest during the trip.

After the trip Gene paid this tribute to street cars:

These cars certainly are in the championship class and the best I ever rode in. They are a "knock out" and a compliment to both the company that operates them and the city whose people they serve. With this car at my disposal I feel complimented.

Research Fellows to Be Appointed at Wisconsin

Two research fellowships in engineering are to be appointed on April 30 by the University of Wisconsin. Candidates must be graduates of engineering colleges of recognized standing, and preferably, should have had one or two years of graduate study, of teaching, or of engineering experience. Applications will be received up to April 15. Information and application blanks can be obtained from Dean F. E. Turneaure, College of Engineering, Madison, Wis.

The appointments will be for a period of two years, subject to satisfactory service, and the salary will be $900 for the first year and $1,100 for the second year. A fellow will be expected to devote not less than half time to assigned research in the College of Engineering, but will be given an opportunity to complete the requirements for a master's degree within the two-year period. The period of service will be the usual academic year, including the short vacations.

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Failure Predicted for New York Unification Legislation

Political wiseacres say that with the Legislature scheduled to adjourn on March 15, the prospect of action on the transit bills drafted for its consideration is far from promising. The plan of reorganization has been agreed upon by the Transit Commission and the Board of Transportation, and the provisions of unified operation of the rapid transit facilities of New York have been approved by representatives of the B.-M.T. lines. The bill embodying the proposal has not even been introduced.

Hearings on Illinois Terminal Case to Be Resumed

Hearings on the applications of the Illinois Terminal Company to lease the St. Louis, Troy & Eastern, St. Louis & Illinois Belt Line, St. Louis Electric Terminal and the main division of the Illinois Traction, Inc., will be resumed here on March 16, according to an announcement of the Interstate Commerce Commission. This action was taken to enable the receivers of the Chicago & Alton Railroad, who have intervened in the case, to prepare various exhibits in opposition to the lease.

Chicago Traction Negotiations Postponed Until April 10

Members of the Chicago City Council sub-committee on local transportation voted recently to discontinue their hearings on the proposed traction legislation until after the primary election on April 10. The subject was said to have become too deeply involved in politics to warrant any further effort to complete the draft of the legislative bills and to frame a new ordinance. Because of the committee's decision, it is now thought improbable that anything more can be accomplished toward settling the problem until the next regular session of the legislature in 1929.

32,000 Bought Sunday Passes on Feb. 26

The fact that only 23,000 persons purchased 25-cent unlimited ride tickets on Washington's Birthday, Feb. 22, has caused officials of the St. Louis Public Service Company to conclude that the patrons do not desire a concession of this kind on week-days. The passes were tried out on Weshington's Birthday with a view to obtaining an expression from the car riders. The passes are being used on Sundays by an increasing number of car riders. On Sunday, Feb. 26, more than 32,000 persons purchased the 25-cent tickets. On the first Sunday the passes were sold only 20,000 used them. The plan has now been in vogue for six weeks and each week has shown a gain over the preceding Sunday.

Good Response to "Suggestion Letter" in North Carolina

The best "suggestion letters" from employees of the North Carolina Public Service Company in the Greensboro, High Point and Burlington districts were rewarded recently with three prizes of $15, $10 and $5. Fifty-one suggestions were turned in. M. P. Bullard, order dispatcher, W. F. Hammer, electric line superintendent, and S. J. Rink, railway operator, were the winners in the January contest.

Traffic Study Planned in Baltimore

Plans to organize for the purpose of making a study of traffic conditions in Baltimore, Md., including the subject of one-way streets in the downtown section, are being made by a special commission appointed by Mayor William F. Broening. The United Railways & Electric Company, is represented on the commission by Dean J. Locke, staff engineer. Charles F. Goob, chief engineer of the city, has been designated as chairman. Appointment of the commission was authorized by the City Council.

One of the first acts of the body will be to make a study of the report made by Kelker, Deleuw & Company, Chicago, traffic experts who made a survey of the city a few years ago. A large part of the expense of this survey was borne by the United Railways & Electric Company.

Positions Abolished in Retrenchment in Detroit

In line with a recent announcement that economies would be effected by the abolishing of positions in the organization of the Detroit Department of Street Railways, Detroit, Mich., the duties of which overlapped those of other positions, the position of chief investigator held by John Moritz has been abolished by the department. It is understood that the work formerly done by Mr. Moritz is being assumed by Rufus G. Lathrop, secretary to the Street Railway Commission and chief of the insurance distribution branch of the municipal railway system. In addition to acting as head of the department's investigation division for the past two years, Mr. Moritz has done special investigating

Report for 1927 of Accidents on Street Railways in Pennsylvania compiled by the bureau of accidents of the Public Service Commission of the Commonwealth of Pennsylvania

DISTRIBUTION OF ACCIDENTS

Number of Accidents	Cause of Accidents	Employees Killed	Employees Injured	Passengers Killed	Passengers Injured	Trespassers Killed	Trespassers Injured	Others Killed	Others Injured	Total Killed	Total Injured	Per Cent Killed	Per Cent Injured
117	Collision of cars	2	5	1	543	.....	..	.....	1	3	549	2.13	12.72
33	Grade crossings (other than streets)	....	1	....	5	.....	..	10	57	10	63	7.09	1.46
990	Collision of car and vehicle (not at grade crossings)	....	6	....	298	.....	1	38	1,157	38	1,462	26.95	33.87
		....	3	....	156	1	2	.....	21	1	182	.71	4.22
65	Derailments	....	1	....	6	.....	2	.....	1	.....	10	.....	.23
10	Contact with overhead or side obstruction	....	1	....	1	.....	..	1	3	1	5	.71	.12
5	Contact with trolley or feed wire	....	2	....	58	.....	..	.....	2	.....	62	.....	1.44
54	Defect or failure of roadway or equipment	....	....	1	95	.....	..	.....	.....	1	95	.71	2.20
96	Persons caught by folding doors	....	1	....	152	.....	..	.....	.....	.....	153	.....	3.54
153	Persons boarding standing cars	....	5	2	483	.....	17	.....	.....	2	505	1.42	11.70
507	Falling from car	....	1	....	393	.....	..	.....	.....	.....	394	.....	9.13
394	Falling within cars	....	2	....	21	.....	3	.....	.....	.....	26	.....	.60
26	Jumping on or off while in motion	6	....	....	.....	14	10	63	584	83	594	58.86	13.75
677	Struck by car	....	....	....	7	.....	..	.....	63	.....	70	.....	1.62
70	At elevated or subway platforms	....	14	....	.....	.....	..	.....	.....	.....	14	.....	.32
14	Repair work on right-of-way	....	30	1	86	1	1	.....	16	2	133	1.42	3.08
135	Miscellaneous	8	72	5	2,304	16	36	112	1,905	141	4,317	100.00	100.00
3,346	Total	5.67		3.55		11.35		79.43		100.00			
	Per cent of total killed		1.67		53.37		.83		44.13		100.00		
	Per cent of total injured												

COMPARISON OF YEARS 1926 AND 1927	Per Cent
Decrease of 94 accidents, or	3
Decrease of 8 killed, or	5
Decrease of 225 injured, or	6

KILLED	1926	1927	Difference	Per Cent
Employees	9	8	1 Decrease	11
Passengers	7	5	2 Decrease	28
Trespassers	19	16	3 Decrease	16
Others	114	112	2 Decrease	2
Total	149	141	8 Decrease	5

INJURED	1926	1927	Difference	Per Cent
Employees	99	72	27 Decrease	28
Passengers	2,262	2,304	42 Increase	18
Trespassers	25	36	11 Increase	44
Others	2,186	1,905	281 Decrease	13
Total	4,572	4,317	255 Decrease	6

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work for the corporation counsel's office. The position of staff engineer, formerly held by Charles E. Hewitt at $8,000 per year, has also been abolished. This position was created about a year ago at the suggestion of one of the commissioners, but according to other department heads has not been justified.

The reorganization which has been going on during the past few months is expected to result in a saving of nearly $300,000 per year in salaries alone.

$1,225,000 Improvement at Oklahoma City

Local railway to build electrified belt line to help increase freight revenues. Location of industries along belt line encouraged

ONE OF the big improvements to be completed by the Oklahoma Railway, Oklahoma City, Okla., within the next few months is a freight-carrying electrified belt line extending around the northwestern, western and southern environs of Oklahoma City. This line will connect the company's Oklahoma City-El Reno interurban with the line from Oklahoma City to Norman eliminating the necessity of hauling through freight along the former route on Classen Boulevard in Oklahoma City. The line is to cost approximately $1,225,000. The company now has cars sufficient to meet the requirements of the new line.

The proposed line is a result of a desire of Hubert Hudson, president, and other new owners of the company, who purchased it while it was still in receivership, to increase revenues from freight sources and also to please residents along Classen Boulevard who had objected to the interurban tracks on that thoroughfare being used for freight hauling purposes.

When the receivership was lifted and the new owners assumed control late last year, the plan for the belt line was worked out and finally financed. The matter was taken up with the City Council early in January, but the many complications over right-of-way and other matters caused a delay in the approving of the contract by the City Council until Feb. 15.

After the contract was approved by the Council some of the Classen Boulevard residents discovered that the contract, while it provided for removal of through freight traffic from Classen Boulevard, retained for the company the right to haul its own materials on the line and provided for the retention of a freight spur near 25th Street and Classen Boulevard. The Classen Boulevard objectors, insisted on having freight hauling eliminated entirely from this street. About 50 of these objectors appeared before the City Council and the Mayor promised to withhold his signature until this matter could be adjusted.

Although all other disputes and difficulties had been settled on March 3 the adjustment between the Classen Boulevard people and the railway had not been accomplished and the contract was still unsigned. The railway, however, showed its faith by beginning to assemble material and starting construction at some points.

The belt line was desired by the city authorities, the railway and practically all residents of Oklahoma City, but many difficulties had to be overcome before an agreement could be reached. Many of these pertained to securing the right-of-way. A few months ago Oklahoma City voted $10,000,000 in bonds for the removal of the tracks of the Chicago, Rock Island & Pacific Railway from the business center of the city to a location farther south and for straightening the river channel, building bridges and viaducts and other improvements. The southern portion of the Oklahoma Railway belt line project will extend into the district where the Rock Island tracks are to be removed and where some of the river channel and bridge work is to be done.

The first disagreement arose between the Rock Island Railway and the Oklahoma Railway over the locations of lines, rights of building switches to certain industries and other conflicting matters. Included in the bond issue was a provision for a viaduct on Exchange Avenue which is to be constructed at or near the point where the new right-of-way of the Rock Island Railroad and of the Oklahoma Railway belt line would be located. Finally it was agreed that the Rock Island Railroad, the Oklahoma Railway and the city should join in the expense of constructing the viaduct. The city owned titles also to several parks, one of which had been held in trust by the city to be used exclusively for railroad terminal purposes. As the title to the city contained reversionary clauses applying in case the property was not used for railroad terminal purposes, it was necessary to file condemnation suits to clear the titles. The company has also filed several other condemnation suits involving land owned by individuals.

The matter of locating the belt line far enough from the city limits to prevent it from becoming a menace to future growth of the city was also considered and adjusted. Objections raised by some of the residents of south Oklahoma City against grade crossings at certain streets near the river caused another delay. The Oklahoma Railway, however, promised to separate the grades on these streets and the difficulty was removed.

The new belt line will also be utilized by the Oklahoma Railway to transfer freight to steam railroads passing through the city. Cheap industrial sites have been arranged along the belt line to encourage the location of industries and increase freight revenues.

Bandits Rob Columbus Employees

After kidnapping two truck drivers and a watchman, employees of the Columbus Railway, Power & Light Company, four masked robbers drove them to an alley of Franklin Park South, Columbus, Ohio, on March 4, and stole 10,000 detached street car tickets and about $150 in cash. The money and tickets were the receipts for the preceding day from the Main and Neil and Oak lines. Later in the day the tickets, some transfers and money boxes were found along the roadside near Agler and Burwell Roads.

Fare Decrease in Muskogee Granted

Authority to reduce the city railway fares in Muskogee from 10 cents cash fare, 3 tokens for 25 cents, to 10 cents cash fare, 2 tokens for 15 cents was granted the Muskogee Electric Traction Company on Feb. 24 by the Oklahoma Corporation Commission. The application had the endorsement of the city manager and the chamber of commerce of Muskogee.

Foreign News

Glasgow to Allow Ads in Cars

After holding out for nearly 40 years against allowing advertisements on its street cars, the Glasgow Town Council, Glasgow, Scotland, recently voted to consider bids for advertising rights on the corporation street cars. An offer has been made which represents a payment of practically $5,000 weekly for exclusive rights. The sub-committee has recommended acceptance of this offer, stipulating, however, that the advertisements shall be confined to the upper partitions of the inside windows and must be of a transparent character.

The committee recommends that sanction be refused to any announcement containing scripture texts, political matter, or reference to alcoholic liquors. It is expected that with these reservations the corporation will accept the offer.

Trackless Trolley Line for Prague

Trackless trolleys will be installed in Prague, Czechoslovakia, on a route where the former street car service has been discontinued, according to the president of the board of directors of the Prague Electric Railway Administration.

The new cars will be so arranged that they can turn out five meters, almost 16½ ft., on either side of the trolley wires. If they prove successful it is expected that their use will be extended.

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Electrification in Natal, South Africa

The largest main-line electrification in the British Empire is said to be a route mileage of 175 on the main line between Glencoe and Pietermaritzburg in Natal. According to the report of Sir William W. Hoy, general manager South African Railways and Harbors, electric locomotives on this line are showing notable superiority to the former steam equipment. They are available during practically 90 per cent of the time as compared with not more than 50 per cent for the steam locomotive. They are averaging 7,000 miles per month as compared with 2,700 for the steam locomotive, and some of the units have already done 75,000 miles without heavy overhaul. Steam locomotives frequently had to be withdrawn from service for heavy repairs after a run of from 25,000 to 30,000 miles.

Republic of San Marino to Construct Railway

Plans are now being made for the construction of an electric railway connecting the capital of the Republic of San Marino, Italy, with the city of Rimini on the Adriatic Sea. The cost of the railway is to be borne jointly by the governments of Italy and San Marino.

San Marino which was founded in the fourth century, is said to be the world's oldest independent state. Hitherto access to the republic has been by carriage or motor, the road distance from Rimini being about 20 miles. The new line will facilitate commercial and industrial relations between the ancient republic and the surrounding kingdom.

Buses Installed in Beira

Trolley services in Beira, Portugese East Africa, are to be augmented by buses. The Urban Commission of Beira has asked for bids for the privilege of operating a bus line in the city and its environs.

The new bus service, which is planned to eventually replace trolley service in the city, provides for eight buses for whites and two for colored, with one to be held in reserve. The franchise is to be exclusive for a five-year period, unless the licensee is fined for breaches of the provisions of the contract three times, in which event it becomes void. The fares are to be approved by the commission and all employees in contact with the public are to be white Portuguese.

Birmingham Development

The tramway and bus department of the city of Birmingham, England, has opened a new depot with accommodation for 70 tramcars and 30 buses. The new building is required on account of tramway and bus developments. The cost of the depot, which covers 2 acres, is £37,000.

Recent Bus Developments

Permit Refused for Staten Island

Commission insists bus company awarded franchises from city shall prove its financial and operating responsibility

APPLICATION made by the Tompkins Bus Corporation for a certificate of convenience and necessity to operate buses on eighteen routes in Staten Island was denied on March 7 by the New York Transit Commission. The company sought a certificate after it had been granted franchises by the Board of Estimate last July. Issuance was opposed chiefly by the Staten Island Rapid Transit Company, which protested that the new lines would duplicate its service. Commissioner Godley said:

In my opinion, this commission should not grant the certificate to and approve the exercise of a franchise by a corporation which neither has nor can procure sufficient funds to finance the enterprise. The people of Staten Island, if they are to have legalized bus operation, are entitled to have the operation conducted by a company of sufficient financial ability to furnish modern equipment and efficient service.

The president of the applicant company testified that if the certificates were granted the applicant intended to issue $500,000 in equipment notes to be sold at a price to net the company about 96 and $500,000 in 7 per cent preferred stock to net the company 90. With the money thus secured, the applicant intended to spend $600,000 for new equipment; about $125,000 for new garage facilities and, after the payment of certain equipment notes now outstanding, have left $100,000 for working capital.

Although the applicant promised from time to time to produce responsible people who would undertake the financing and although numerous adjournments were granted to enable it to produce such proof, the evidence was never offered and the applicant finally rested with the production of its balance sheet as of Nov. 15, 1927.

The balance sheet referred to showed that the company, which has been operating buses on the proposed routes for some time, had quick assets of $62,677 and quick liabilities of $42,077. But, it was shown, a claim of $30,000 had been made against the managers, the value of which was not made clear and that the company owed $147,000 on equipment in use.

Minthorne T. Gordon, Jr., president of the company, admitted that most of this equipment still unpaid for would have to be replaced with new equipment to be purchased by funds raised under the proposed financing plan. The old equipment had been either purchased on conditional sales agreements or rented with an option for purchase.

The opinion concluded:

In short, the proof adduced shows that the applicant has no funds with which to finance the operation which it has undertaken under its franchise and has no definite plan for procuring such funds.

In my opinion, no certificate should issue unless the applicant shows such ability and resources as will give some assurance that the operator will furnish efficient service commensurate with public needs. I therefore recommended that the application be denied.

The Tompkins Bus Corporation is now serving at a 10-cent fare parts of the territory where once the city's municipal trolleys operated at a 5-cent cash fare but at a cost to the taxpayers of 12 cents for each passenger handled.

Wherry & Wight were counsel for the railway and Fisk & Roberts were the consulting engineers.

Regulations Drawn Up By Georgia Commission

A list of important regulations has just been drawn up by the Georgia Public Service Commission and submitted to the different bus operators in the state for their consideration before being definitely put in force.

One regulation provides that a bus driver who drinks liquor on or off duty forfeits his right to employment as a bus driver within the state. Another requires that all drivers be carefully examined and their ability to drive a bus tested. A third provides for the careful inspection of every vehicle by a competent mechanic between each trip. Other regulations provide for a speed not to exceed 40 m.p.h.; that drivers give their undivided attention to driving while on duty, making it unlawful for them to talk to passengers or for passengers to talk to them; that, in case of a breakdown, provision be made to transport the passengers to their destination, and that accidents be immediately reported to the commission.

Other clauses include indemnity insurance for the protection of passengers and property, the filing of fare schedules and operations, and the submitting of regular fiscal reports to the commission. Some weeks ago the commission asked all operators of bus lines in Georgia to file reports giving necessary details of their business.

Decision Hits Illinois Gas Tax

Illinois' brief experiment with a 2-cent state gasoline tax, enacted by the 1927 Legislature, came to an abrupt end recently when the State Supreme Court rendered a decision that the law under which the tax was collected was unconstitutional. The court held that the statute violated the state constitution on several grounds; namely, that it was discriminatory, that it amounted to a double tax on motorists, and that it was misleading in that it failed to state that the levy was upon users of the highways and not upon gasoline. In conclusion the court characterized the tax law as "an unintelligible piece of legislation," and declared that those upon whom the

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law imposed the duty of collecting the tax "could not tell their duties from reading the law."

It is estimated that since the law became effective last August, motorists have paid in to the state treasury more than $7,000,000, approximately $3,400,000 of which was collected in Cook County, the seat of which is Chicago.

Regulation Requested in Tennessee

Regulation of buses and trucks by the State Railroad and Public Utilities Commission was requested in a petition filed with the commission recently by Richard D. Gleaves, attorney for the Tennessee Motor Carriers Association. The petition, after citing various laws which apply to the authority of the commission, asks:

1. That the commission exercise the jurisdiction given them by the various statutes.
2. That it assume control, regulation and supervision of all the public utilities engaged in the business of transporting freight or passengers for hire in the state.
3. That it require all companies to operate vehicles on regular schedules.

The petition states that several recent accidents may be traced to the fact that buses operating in competition have been run at excessive speed in order to arrive ahead of their rivals, and that this has become a practice dangerous to the passengers as well as other vehicles on the roads. The petition was accompanied by an opinion from L. D. Smith, attorney-general of the state, to the effect that the state commission had authority to exercise regulation over the bus lines.

Debate on Bus Bill in Virginia Legislature

By a vote of eighteen to four, the Virginia Senate on March 3, passed the rate-fixing bus bill which nullifies the value of certificates as the basis of rate fixing, except the actual cost thereof.

The bill now goes to the house for concurrence but in view of the fact that the house committee already has twice refused to report out the identical bill, action of the lower body is problematical. In practical effect, the bill would prohibit the state corporation commission, in fixing the bus rates to be charged patrons, from placing any value on the certificates issued beyond the nominal actual cost of the transaction which supporters declared to be $1.50.

Coach Permit Sought in San Diego

The San Diego Electric Railway, San Diego, Cal., has applied to the Railroad Commission for authority to operate auto stage service connecting La Mesa, Lemon Grove and intermediate points.

Bus Expansion for Ohio Valley

Sale of the Interstate and Cannon Ball Bus companies to the Southern Gas Securities Company, Chicago, a subsidiary of the Central Public Service Corporation, has been concluded. The Central Public Service Corporation recently purchased the Ohio Valley Electric Railway, the Portsmouth Public Service Corporation, and the Ohio Valley Bus Company from the American Gas & Electric Company by virtue of the bus purchase completed at Portsmouth. It now controls all of the urban and interurban transportation systems in and between Huntington and Portsmouth. Its bus lines connect Charleston and Columbus, Ohio, Huntington, Portsmouth and Chillicothe, Ohio. The total mileage of the several companies is 202 miles.

Solution of a serious transportation problem will be afforded by the transaction, Mr. Brady, vice-president of the Central Public Service Corporation, indicated. For some time a rate war had been waged with the Cannon Ball and the Interstate bus companies and the Portsmouth Public Service Company, with what Mr. Brady characterized as the usual disastrous results. He said that that section of Ohio Valley had a great industrial future, and that there was a necessity for dependable and adequate transportation. The two services would be co-ordinated with the Portsmouth Public Service Company and the Ohio Valley Bus service between Portsmouth and Huntington on both sides of the river and a thorough study made of the needs of the various communities served. Fred W. Samworth, formerly general superintendent of the Ohio Valley Electric Railway and of the Ohio Valley Bus Company, was made district manager of the Ohio Valley Electric Railway and of the Ohio Valley Bus Company and would also be manager of the Cannon Ball and Interstate bus companies.

Mr. Samworth indicated that no changes in the service in Huntington were contemplated. The three bus lines will continue to operate separately. No curtailment of electric interurban service is proposed as far as the Ohio Valley lines are concerned. However, it will be the policy of the company to curtail electric railway service between Ironton and Portsmouth and increase bus traffic.

15-Cent Bus Fare May Be Asked in Kansas City

The Kansas City Public Service Company, Kansas City, Mo., is preparing to submit to the City Council an outline of its plans for a more useful routing of buses, coupled with a 15-cent fare for the trunk lines to make them self-supporting. It is planned to leave the bus fare on feeder and crosstown lines at 10 cents, with a transfer privilege to street cars.

The policy of the company from the start has been to develop feeder lines in unserved districts, but to seek trunk lines which would pay their own way. The company takes the stand that where bus and rail lines parallel, bus riders should pay a fare that will make the vehicle self-sustaining.

In all probability there will not be radical changes in the routings. It is expected that the Country Club Express, with a 25-cent fare, will be replaced with a Broadway bus line, with regular equipment and regular fare. This line may bend eastward at 55th Street to replace the south end of the Warwick line, which it is believed would pay if it did not extend south of 47th Street.

Past patronage makes it doubtful whether the railway will continue the northeast bus line under the 15-cent fare plan. Another northeast line extended along some eastern traffic lane may replace it, to tie in all railway lines in that section. A crosstown line some distance south of 39th Street has been discussed, and home owners on South Oak Street have sought a feeder line.

Substitution on Line in Quincy

Authorization has been given the Illinois Power & Light Corporation by the City Council of Quincy, Ill., to abolish railway service on the Fifth Street line and to substitute bus service. Ralph E. Carley, general manager, of the western division of the utilities corporation, has petitioned the Illinois Commerce Commission to approve the change and as soon as it is formally granted the tracks will be torn up and bus service started. The company has agreed to repave the streets along which its track has been located.

Opposes Curtailment in Atlanta

Citizens of the South Boulevard, Sylvan Mills, and Center Hills sections of Atlanta, Ga., have entered a protest with the Atlanta Coach Company against any curtailment of service. The present schedule on week-days begins at 5.30 a.m. and continues until 11.30 p.m., but the company proposes to change to a schedule beginning at 6.20 a.m. and continuing until 8.45 p.m. On Sunday it is proposed to operate the buses between the hours of 11 a.m. and 7 p.m.

The Georgia Power Company, which is operating the buses, states that the amount of traffic secured does not justify the schedules now maintained. On the other hand, citizens of these sections claim that curtailment would be very inconvenient, if it did not actually work a hardship upon many.

New Line Wanted for South Bend

Petition for the establishment of a new bus line which will serve the recently developed section on the west of South Bend, Ind., has been presented to the Indiana Public Service Commission by George R. Green, general superintendent of the Chicago, South Bend & Northern Indiana Railway. The new line will be an extension of the city electric railway service.

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Financial and Corporate

Sioux City Property Sold

The plant and equipment of the railway at Sioux City, Ia., has passed from the control of the United Gas Improvement Company to that of the American Electric Power Corporation, New York, in a $10,000,000 deal. The transaction also included the new $3,500,000 power plant at Riverside, a Sioux City suburb; a $1,000,000 addition now under construction; all wire and plant facilities in Sioux City, the gas plant and main system, the new $300,000 service building at Dace and Court Streets, and several hundred miles of high tension power lines serving approximately 100 towns and cities in northwest Iowa.

The Sioux City properties and outside power lines were operated by the Sioux City Gas & Electric Company, a subsidiary of the United Gas Improvement Company, while the New York corporation, which made the purchase, operates in Iowa under the name of the Iowa Public Service Company. Its headquarters are at Fort Dodge.

The United Gas Improvement Company has held a majority of the stock of the Sioux City Gas & Electric Company since 1889.

C. I. Crippen, vice-president of the American Electric Power Corporation, has announced that W. J. Bertke, president of the Sioux City concern, will continue in that capacity.

R. M. Feustal a South Shore Director

At the annual meeting of the Chicago, South Shore & South Bend Railroad in Chicago on Feb. 28, Robert M. Feustal, Fort Wayne, president of the Indiana Service Corporation, was elected a member of the board of directors. He succeeds P. A. Erlach, resigned.

Preferred Dividends in Gary Quarterly

Dividends on the class "A" preferred stock of the Gary Railways, Gary, Ind., subsidiary of the Midland Utilities Company, will hereafter be paid quarterly at the rate of $1.80 per share on June, September, December and March 1 to stockholders of record of the twentieth day of the preceding month. Previously monthly dividends of 60 cents were paid.

Interstate Issue Offered

An offering of $12,554,000 first mortgage and refunding 4½ per cent gold bonds, series F, of the Interstate Public Service Company, Indianapolis, Ind., due March 1, 1958, has been made by a syndicate headed by Halsey, Stuart & Company. The bonds, due March 1, 1958, are priced at 94½ and interest. Proceeds from these bonds will be used toward reimbursing the company for refunding bonds bearing higher coupon rates and for other corporate purposes. The issuance of these bonds has been authorized by the Public Service Commission of Indiana.

Maturing Note Issue of North Shore to Be Converted

The Chicago, North Shore & Milwaukee Railroad, Highwood, Ill., has called a special meeting of stockholders for May 15 to vote on a proposal to convert $2,684,208 of non-interest bearing notes due June 30, 1928, into 6 per cent non-cumulative preferred stock.

Claims Questions Up in Indiana Interurban Settlement

Claims against the Union Traction Company, Anderson, Ind., due to deaths or injuries were heard in Circuit Court at Anderson, Ind., following a hearing on an agreement of three classes of other claims. Some of the claims were for persons killed or injured in a collision of interurban trains near Alfont, Ind., on Feb. 2, 1924. A proposition by bondholders to many creditors, and said to have been approved by the court, provides that 87½ cents on the dollar be paid on $238,000 of claims that accrued six months prior to the appointment of a receiver for the company on Dec. 31, 1924; 20 cents on the dollar on claims that accrued more than six months prior to the receivership, of which there are $73,000 and 10 cents on the dollar on $23,500 of claims that accrued more than a year prior to the receivership.

Net Income Increases in Philadelphia

$13,010 transferred to surplus of P.R.T. in 1927. 961,618,543 passengers carried on all types of equipment, including bus and taxi

AFTER providing for all charges including a 7 per cent dividend on its preferred stock and an 8 per cent dividend on its common stock $13,010 remained to be transferred to the surplus of the Philadelphia Rapid Transit Company, Philadelphia, Pa., for the year ended Dec. 31, 1927. The net income was $3,782,184, compared with $3,027,694 in 1926. These facts were disclosed in the annual report to the stockholders dated Feb. 29, 1928.

Passenger revenue for 1927, including subway-elevated, street car, bus and taxicab, was $56,070,709. Operating expenses and taxes were $43,321,422. Gross passenger earnings were $1,125,901 less than 1926. This is accounted for partially by a natural local reaction following the Sesqui year, and partially by the condition of industrial depression which began to be felt during the past summer.

At the close of 1927 the company was operating 664 miles of surface track, 39 miles of elevated and subway track, 243 miles of city bus routes, 1,285 taxicabs, and a fast growing system of intercity bus routes. By thus co-ordinating every phase of Philadelphia's public transportation, Mitten Management protects the joint city-company system against the inroads of competitive operation.

The Philadelphia transportation system has become a vast combination of many lines serving many communities. Pennjersey bus lines, owned jointly by P.R.T. and Public Service Railway of New Jersey, extend across the Delaware Bridge to serve the residential

INCOME ACCOUNTS OF PHILADELPHIA RAPID TRANSIT SYSTEM
Compared by ELECTRIC RAILWAY JOURNAL

	1927	1926
Gross passenger earnings	$56,070,709	$57,196,610
Other operating revenue	857,437	830,942
Total	$56,928,146	$58,027,552
Maintenance and depreciation	8,958,698	9,278,331
Power operation	2,385,004	3,613,393
Conducting transportation	20,093,203	20,566,841
General, including accidents	7,577,752	8,047,590
Taxes, including paving tax	3,306,762	3,409,097
Total	$43,321,421	$44,915,254
Operating income	$13,606,724	$13,112,298
Non-operating income	980,917	707,505
Total	$14,587,642	$13,819,803
Frankford Elevated rental and sinking fund—city contract	960,199	867,610
Total	$13,627,443	$12,952,193
Fixed charges and dividends	$13,614,432	12,931,908
Surplus	$13,011	$20,285

STATEMENT OF CAPITALIZATION AND INDEBTEDNESS OF THE PHILADELPHIA RAPID TRANSIT COMPANY AS OF DEC. 31, 1927

Capital Stock	Paid In	Unpaid	Total
Common	$29,996,235	$3,765	$30,000,000
7 per cent cumulative preferred	22,977,200	22,800	23,000,000
Total	$52,973,435	$26,565	$53,000,000

Funded Debt	
Collateral trust 5 per cent bonds due 1957	$4,015,000
Sinking fund 5 per cent gold bonds due 1962	556,000
Sinking fund 6 per cent gold bonds due 1962	8,893,000
Equipment trust:	
Series "D" 1919–1929	18,000
Series "E" 1919–1929	58,000
Series "F" 1922–1932	1,500,000
Series "G" 1923–1933	2,850,000
Series "H" 1924–1934	1,890,000
Series "J" 1926–1936	1,530,000
Real estate mortgage	150,000
Total	$21,460,000

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sections of south Jersey tributary to Philadelphia, thus minimizing the occupation of the Philadelphia streets by independent bus operators. The P.R.T. and P.S.R., through this joint ownership, share equally the receipts and expenses applicable to what might be termed the local Philadelphia and Camden territory. P.S.R. stipulates the timetables for the suburban territory beyond Camden, and, under a special operating agreement, assumes the receipts and expenses thereof.

Bus service over the Delaware Bridge was started in the belief that it would eventually be a valuable aid to the P.R.T. city-wide system. Such service is justified, for the reason that if P.R.T. had not itself supplied the service, independent operators would have increasingly invaded the Philadelphia territory.

The acquisition of the Yellow Cab Company in 1926 served to preserve to the city-wide transportation system the revenue from the profitable short riding business which the cruising taxicabs were winning from the surface car lines, and at the same time capitalized the growing desire of the traveling public for a speedier and more personal type of service. During the year the company added the Cunningham and Diamond cab companies. These companies are being merged with the Yellow Cab Company, thus assembling virtually all local taxicab operations under one management and paving the way for substantial benefits and economies which are already going far toward offsetting losses from bus operation.

INCREASED RETURNS TO STOCKHOLDERS OF THE PHILADELPHIA RAPID TRANSIT COMPANY

Year	P. R. T. Surplus	Dividends on P. R. T. Stock Preferred, Per Cent	Common, Per Cent
1910.	*Deficit* $1,118,609	.....	.....
1911.	358,250	.....	.....
1912.	260,236	.....	.....
1913.	676,849	.....	.....
1914.	930,564	.....	.....
1915.	1,128,017	.....	.....
1916.	2,987,975	.....	$1,348,656–4½
1917.	4,345,900	.....	1,499,277–5
1918.	4,482,119	.....	1,499,290–5
1919.	4,482,532	.....	1,499,290–5
1920.	4,195,356	.....	.....
1921.	5,748,980	.....	.....
1922.	5,640,664	.....	1,799,148–6
1923.	5,616,833	.....	1,799,148–6
1924.	5,652,582	.....	1,799,575–6
1925.	6,178,916	$60,871–7	2,399,639–8
1926.	6,489,188	607,766–7	2,399,644–8
1927.	7,007,436	1,369,531–7	2,399,644–8

The report refers to the Public Service Commission studies of Philadelphia's transportation system and to the recommendations since carried out by the company.

On the subject of traffic congestion the report mentions the vast improvement since the elimination of taxicab cruising. The company put forth intensive efforts to maintain the speed and regularity of its service despite bad conditions of traffic. Its parking areas established at the suburban termini of the Market-Frankford elevated line have proved popular. In these parking areas the motorist may for a fee of 25 cents park his car and receive without added payment a 15-cent ticket entitling him to ride downtown and back on subway-elevated or street car. During the year 1927, 135,000 automobiles were parked in the 69th and Market Streets parking area, an increase of 55 per cent over the year 1926; 75,000 automobiles were parked in the Frankford Avenue and Bridge Street parking area, an increase of 27 per cent over 1926. In the latter part of the year arrangements were made with the Camden Bridge Garage whereby motorists might park their cars in this garage and receive, in return for a nominal fee, tickets entitling them to ride via Pennjersey buses from Camden to the Philadelphia business district and return.

STATEMENT OF INCREASED RIDING IN PHILADELPHIA

Calendar Year	Revenue and Transfer Passengers	Rides per Capita
1910	443,204,502	288
1911	517,697,478	329
1912	549,674,683	343
1913	580,011,057	357
1914	581,297,949	352
1915	594,220,409	354
1916	669,008,258	392
1917	726,936,340	419
1918	763,008,395	432
1919	866,944,336	483
1920	908,482,135	501
1921	836,547,351	451
1922	848,883,512	450
1923	918,775,871	480
1924	913,855,751	469
1925	926,928,994	468
1926	966,469,223	480
1927	935,412,879	457
Co-ordinated System, incl. Bus and Taxi, 1927	961,618,543	470

Based upon the experience gained and the great advantage already secured in now keeping more than 1,000 motors each business day out of the downtown district, and preparatory to the operation of the Broad Street subway, this management has made plans for the early erection of a garaging-terminal building at the Olney Avenue end of the subway. This garage will be modern and efficient in every respect, will have a capacity of 500 cars, will be constructed over the top of the company's present surface car loop, and will afford convenient access to the subway station directly beneath the building. The company is also urging the use of the public garages so that the public thoroughfares be left free for public transportation in vehicles which efficiently utilize the highway space.

In spite of the greatly increased congestion of the streets due to the increasing use of motor vehicles, the company has established during the past year a noteworthy record in the reduction of accidents. Accidents on the surface system have been reduced 21.2 per cent under the record of 1926. Accidents per 100,000 car-miles in 1927 were 52.76 compared with 63.98 in 1926, a reduction of more than 17 per cent. The record of cars pulled in for mechanical failures was but 0.335 per cent of cars operated. Car collisions, a type of accident already infrequent on P.R.T. system, were still further reduced 49 per cent during the year. There were 139—including a period of ten consecutive—no-collision days.

The increasing need for new and modern general shops to replace the present shop facilities and permit more economical handling of maintenance and repair work has been felt by this management for some years. This much needed facility has been postponed from year to year to permit the use of available funds for extended and improved service to the public. P.R.T. has now acquired a tract of land admirably suited for this purpose located near Second Street and Olney Avenue, and will develop its general shop plans forthwith.

P.R.T. general offices were established in the new Mitten Building at Broad and Locust Streets on June 1, 1927. The centralization of all office work under one roof releases many quarters heretofore so used throughout the city and has already made possible substantial economies and efficiencies. Mitten Building also houses the Mitten Bank Industrial Section, Mitten Bank Securities Corporation, and Mitten Management.

The company has been in the forefront of the movement toward a wider distribution of the ownership of industry among the people served. By this means a more enlightened attitude on the part of the public toward P.R.T. and toward industry generally has been secured, resulting in a better understanding of the problems. There is no question that public indorsement of the complete co-ordination of street car, bus and taxicab has been due as much to the wide distribution of resultant dividends to car riders as to the greater service which co-ordination has made possible.

STATEMENT OF WAGE TRENDS IN PHILADELPHIA

Calendar Year	Max. Hourly Wage, Cents	Passengers Carried per Trainman
1910	23	59,699
1911	23½	72,405
1912	25	77,561
1913	30	85,762
1914	30	89,790
1915	30	96,106
1916	32	107,800
1917	35	113,940
1918	48	120,102
1919	58	137,785
1920	72½	150,785
1921	65	137,432
1922	69	141,528
1923	70½	146,658
1924	71½	148,264
1925	77	148,632
1926	77	151,173
1927	77	145,862

The 7 per cent cumulative preferred stock is held by 40,000 small investors, most of them car riders, many of whom have purchased the stock at the rate of $1 per share per week payable on P.R.T. cars. On Dec. 1, 1927, all of the $23,000,000 authorized preferred stock had been absorbed. The City Council on Dec. 17, 1927, gave its necessary assent to the issuance of $7,000,000 additional 7 per cent preferred stock, needed to refund outstanding indebtedness and finance additional maintenance facilities and service extensions recommended in Dr. Snow's report to the Public Service Commission. The stockholders authorized this additional preferred stock issue at a special meeting held on Feb. 6, 1928.

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The report goes into detail on the status of the stockholders. The stockholders from 1902 to 1911 had never received return on their stock subscription of $30,000,000. In 1910 they saw their property threatened with receivership, through being unable to meet its fixed charges. The stock, par $50, was selling at $7 a share. It is now selling on the market at $60 a share, and pays 8 per cent.

The property of P.R.T. stockholders has been completely rehabilitated. From a condition of no reserves and no surplus, adequate reserves and surplus have now been provided against known needs of the future.

Supplementing its statement on the increased riding the report states that in 1910 the average Philadelphian rode in P.R.T. cars only 288 times a year. Per capita riding had been built up by 1920 to 501. In 1920, when increased costs made added income necessary, Mitten Management sought to retain the basic 5 cent fare, urging that a flat increase would lose the profitable short-ride business and lead to still higher fares. The Public Service Commission did not agree, and ordered a flat increase to 6¼ cents.

The following year, 1921, P.R.T. lost 100,000,000 short-ride passengers and has never since reached the high per capita riding of 1920. A further fare increase was from this cause made necessary in 1924.

Accompanying the statement on wage trends the report explains the market basket basis and compares the present management-men relationship with the status of the employee in the dark ages of industrial democracy.

Officers and Directors of Hocker Line Elected

At a meeting of the organization committee of the Kansas City, Merriam & Shawnee Railroad held in Kansas City, Feb. 27, officers and directors were elected.

Officers are Herman Sonken, president; W. K. Paul, Merriam, Kan., vice-president and general manager; L. G. Galamba, secretary; F. P. Dixon, treasurer; J. D. Cornell, general traffic manager; W. S. Barton, assistant traffic manager.

Members of the new board of directors are: A. M. Summermour, chairman; George McAnany, A. A. Sharum, A. M. Meyers, E. G. McDonald, F. P. Dixon, L. G. Galamba, W. K. Paul, W. F. Blanton, H. J. Miller, John Sanders, L. W. Wilson, Dick O'Brien, Herman Sonken, Herman Galamba, W. S. Barton, Fred Jackson, all of Kansas City; James E. Smith, Topeka, Kan.; W. W. Gordon, Kansas City, Kan.; A. E. Faulkner, Lincoln, Neb.; C. Neiman, Shawnee, Kan.

The electric line is the old reorganized Hocker line. A petition for a charter was filed in Topeka by Fred Jackson, general counsel.

Reorganization details have been published in these columns previously.

Book Reviews

Where Shall They Park?

National Safety Council, Chicago. 18 pages, 25 cents, with reduced prices for copies in quantity.

The subject of automobile parking is considered in this book primarily from the standpoint of accident prevention, i.e., the best way of parking where that practice is permitted, rather than the best way of stopping parking. Nevertheless, the pamphlet clearly brings out the constantly increasing demand upon street space for moving traffic, its primary right to such space, and the desirability in many cases of limiting parking and even of prohibiting it. The opinions of many merchants where this has been done are quoted to show that limitation or prohibition has not injuriously affected retail business.

The Port of New York Authority

Annual Report for the Year 1927. 70 Pages.

In the annual report of the Port of New York Authority, created by compact between the states of New York and New Jersey and ratified by Congress, it is said that progress has been made toward the solution of the problem of transporting passengers commuting between New York City and the suburbs. Part 1 covers the development of the port; part 2 interstate bridges; part 3 suburban transit and part 4 financial operations. In its conclusions on suburban transit the report states that conclusions contained in the sub-committee reports embodied in the preliminary report of the Suburban Transit Engineering Board of Jan. 11, 1928 are sound. The report also recommends concurrent legislation by New York State in support of this program.

Industry's Coming of Age

By Rexford Guy Tugwell. Harcourt, Brace & Company, New York, N. Y. 274 pages. Price, $2.

Not long ago a keen Frenchman, André Seigfried, made a study of this land and called it "America Comes of Age." Just now a well-known economist, Rexford Guy Tugwell, surveys industry and sees it coming out of the adolescent stage. The question which both books provoke is—what is in store for America?

In "Industry's Coming of Age" a wealth of facts is marshalled to prove the astounding growth in our productivity since 1914. The author says we are in the midst of a new industrial revolution which calls for intelligence in furthering and controlling business trends for human welfare. In treating the ills of industry a popular fallacy appears in thinking that almost anything can be done or in thinking that nothing at all can be done. Neither those who claim eternal prosperity for America or those who flee industrialism by exile in Europe contribute very much to an understanding of the changes which, if not controlled, in Dr. Tugwell's opinion will not always make for one's betterment.

In his discussion of the progress of productivity Dr. Tugwell proceeds to the general and technical causes for our virility. Among the general causes, great emphasis is placed on the spread of education, the inheritance of and addition to the racial store of technical skill and knowledge, progress toward the more complete division of labor and the consequent mechanization of industrial processes and the recent capitalizing on the possible productive contribution of women. Among the technical reasons he lists at the top the discovery and spread of scientific management and the elimination of rule-of-thumb, with standardization of many basic materials and processes.

Dr. Tugwell sees barriers to productivity in the persistence of depressions and weak spots even in good times. Herein is the reason for stock taking of American life and business now that the latter has reached its maturity. He makes a convincing and forceful plea for a better understanding of the economic forces at play so that adjustments can be made to care for the needs and desires of men.

Mr. Siegfried, who sees America at maturity, concludes with a declaration that the discussion resolves itself into a dialogue between Ford and Ghandi. Dr. Tugwell sees achievement in recognition of trends so that we can work for attainable results.

American Universities and Colleges

Edited by David Allan Robertson. (The American Council on Education). New York and London: Charles Scribner's Sons. 884 pages; price, $2.50.

The character, scope and organization of higher education in the United States is reviewed in Part I of this volume. Part II presents condensed information regarding each of the universities and colleges on the accredited list of the American Council of Education. Supplementary information regarding thirteen classes of professional and fifteen classes of graduate schools is given in Part I. For some unexplained reason, engineering schools have far less space in proportion to their number than the other schools. Thus 130 engineering schools are given less than three pages, consisting mostly of names of schools by states, while twenty-five schools of economics are given eleven pages, with a list of professors, their degrees (by institutions), the subjects they teach, and, in some instances, other information as well. The book is valuable merely as a compilation.

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Personal Items

H. J. Woodard Succeeds F. A. Brine at Atlanta

F. A. Brine has resigned as general auditor of the Georgia Power Company, Atlanta, Ga., because of ill health. His service record with the company covered 27 years.

This post has been filled by H. J. Woodard, who has been with the company for many years in which he has served in every capacity in the accounting department and in the auditing of every department. He joined the company as a clerk.

J. J. Esch Rejected as I. C. C. Member

By a vote of ten to seven the Senate Interstate Commerce Committee voted to reject the renomination of John J. Esch of Wisconsin for the Interstate Commerce Commission on March 6. His defeat comes after many years in public service work. Although as a result of the Senate's failure to act upon his renomination he automatically went out of office on Dec. 31, 1927, President Coolidge reappointed him on Jan. 3 to act during the recess of Congress over the holidays and until that body could pass upon it.

Mr. Esch was nominated on March 11, 1921, by President Harding for appointment to the Interstate Commerce Commission. He had been chairman of the House Committee on Interstate and Foreign Commerce and had manifested a special interest in railroad and transportation affairs in Congress. At that time he was appointed for a full term of seven years to succeed Robert W. Wooley, whose term expired on Dec. 31 of that year. As a member of the House of Representatives he was co-author of the transportation act and was reappointed by President Coolidge on the expiration of his first term as a commissioner.

O. J. Shaw Resigns at Lincoln

O. J. Shaw, former general manager of the Lincoln Traction Company, Lincoln, Neb., who became operating executive for the Lincoln Public Service Company when it purchased the gas and electric properties of the utilities, has resigned to devote his time to two industries of which he is the chief stockholder. Mr. Shaw has long been connected with the railway in Lincoln. The properties are now owned by the United Light & Power Company, operating through two local corporations.

Mr. Shaw joined the Lincoln Traction Company in 1911 serving in the contract department. Later he was made assistant secretary and in 1913 he became secretary. For several years prior to his becoming general manager in 1920 he had charge of the company's overhead lines, the steam heating plant, the commercial department and the accounting department. He is a graduate of the University of Nebraska.

A. J. Fink in St. Louis as Transportation Engineer

The tireless efforts and indefatigable services of A. J. Fink have found their medium in St. Louis, Mo., where as transportation engineer of the St. Louis Public Service Company, Mr. Fink will have an unusual opportunity to capitalize on his traffic studies and experiences gained in Pittsburgh. He was appointed on March 1 to his new position.

A. J. Fink

Mr. Fink is another "up-from-the-ranks" officer and knows the business of transportation. He has served as conductor—and so knows the employees' viewpoint—as traffic checker on the sidewalk and as time-table-compiler. Eight years ago Mr. Fink went to Pittsburgh and worked with Thomas Fitzgerald, who at that time was consulting engineer for the Philadelphia Company, on the reorganization of the Pittsburgh Railways. After the multitudinous details of this work were completed, Mr. Fink was appointed assistant to the general manager in 1924. In this capacity he served until November, 1926. At that time the new form of railway supervision was instituted by the Pittsburgh Railways based upon a policy of making each executive assume entire responsibility for his own departmental activities. It solidified and systematized the entire structure of the organization. In line with this policy J. M. Loftis, superintendent of transporation, was placed in charge of three district functions of electric railway transportation, namely, traffic and schedule, car operation and trainmen's instruction, with a superintendent appointed to head each branch. A. J. Fink was appointed superintendent of the traffic and schedules reporting to Mr. Loftis. To him was assigned the responsibility of seeing that the service was carried through.

Mr. Fink was born in Cincinnati, Ohio, and was educated in the schools there. In 1905 he entered the service of the Cincinnati Traction Company, and was employed in the operating department until 1920 when he went to Pittsburgh.

With the St. Louis Public Service Company Mr. Fink's chief task will be to carry out plans already in operation and to determine the best arrangement of traffic and schedules. One of the factors in this work is the new transfer system put into effect Jan. 1 by which the company is able to study the direction of its patrons and ascertain which locations are the most popular.

E. H. Maggard Succeeds W. S. Palmer at San Francisco

With the retirement early in April of W. S. Palmer as president and general manager of the Northwestern Pacific Railroad, San Francisco, Cal., attention is again directed to E. H. Maggard, elected by the board of directors to succeed in that post. Mr. Maggard's experience in railroading covers a period of more than 35 years. During that time he has held responsible posts in the south and in California but is known especially for his services with the Petaluma & Santa Rosa Railroad of which property he has been general manager since 1916 and president since 1925. In 1926 he was elected president of the California Electric Railway Association.

Prior to his association with the California property, and at an early age, Mr. Maggard entered the service of the Missouri, Kansas & Texas Railway at Denison, Tex., as call boy. In 1893 he resigned to accept a position with the Southern Pacific at Houston as clerk in the freight office. In this capacity he remained until 1900 and then he entered the service of the El Paso & Northeastern Railway at El Paso, Tex., as chief clerk in the freight office. Soon he was promoted to agent of the company and from agent to superintendent of terminals. It was from this property in 1907 that he resigned to go as general freight and passenger agent with the Petaluma & Santa Rosa Railroad.

Mr. Maggard was born at Meridian, Miss., in 1875. He moved to Texas with his parents in 1877 and was educated in the public schools at Corsicana and Denison. His appointment to the presidency of the Northwestern Pacific Railroad which operates 41 miles of electric lines and is controlled by the Southern Pacific Company is expected to aid the Southern Pacific and Santa Fé in their application now pending before the Interstate Commerce Commission to acquire the Petaluma & Santa Rosa Railroad.

W. S. Palmer, the retiring president was made general manager of the Northwestern Pacific Railroad in 1907. Seven years later he became president and general manager. He entered railroad

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service in 1876, following his graduation as a civil engineer from the University of California. He worked many years with the Central & Southern Pacific as an engineer of construction and in 1901 became superintendent of the Sacramento division. Following the joint acquisition of the Northwestern Pacific Railroad by the Southern Pacific and Santa Fé Mr. Palmer went with that property.

Promotions at Rome Division

Three changes in personnel of the Georgia Power Company, Atlanta, Ga., affect operation at the Rome Division. These promotions were announced by W. E. Mitchell, vice-president and general manager.

T. S. Sloan, who recently resigned his position with the Central Georgia Power Company, became division manager, effective March 1.

J. H. McCombs, former distribution engineer in Atlanta, has been promoted to division superintendent of operations, effective March 1.

J. M. Flanigen, appointed division superintendent in December, is scheduled for Atlanta.

William Siebert of Brooklyn Honored

William Siebert, superintendent of transportation of the surface lines of the Brooklyn-Manhattan Transit Corporation, Brooklyn, N. Y., has rounded out 40 years of service on the Brooklyn railway lines, twenty of which have been spent in his present position of superintendent of transportation of the surface lines. In recognition of that event more than 130 of his associates and friends gathered recently at Prospect Hall, Brooklyn, to congratulate him on his many years of well-performed service. The affair was in the nature of a surprise.

Most of those at the dinner were men who have worked with Mr. Siebert in the Brooklyn companies for many years and cherish their friendship and association with him, and as a small token of their affection and esteem, they presented to him a sterling silver beverage set and tray.

County Clerk William E. Kelly was the toastmaster of the evening and the speakers were Supreme Court Justices Stephen Callaghan and Edward J. Byrne, President W. S. Menden and Vice-President Travis H. Whitney of the B.-M. T. System; Vice-President Clinton E. Morgan of the Brooklyn City Railroad and Mr. Siebert himself.

Mr. Siebert began his railroad career in 1887 as a conductor on the Nostrand Avenue horse car line. His advance through the ranks was steady until he finally was in charge of the Ridgewood Depot. Mr. Siebert told the story of his appointment to the post of superintendent of transportation of the surface lines in 1907. He said:

One day about twenty years ago Mr. Menden sent for me to come downtown and see him. When I got into his office he told me he wanted me to take the job of superintendent. I told him I did not want the job as nobody seemed to last long in that job and I had a family to take care of. He said he thought I would be able to handle myself satisfactorily in the job and finally told me to take a week to think things over and then come back to see him. I went back a week later and told him again that I didn't want the job. But I didn't know he had been talking with Harry Crowe and some of the others who knew me downtown and they had told him just to tell me to try my hand at the job and I would stick at it. At any rate, when I told him I still didn't want the job, he simply said he'd have to have someone downtown and asked me to go inside and help him out temporarily. That was twenty years ago and I'm still helping out.

He summed up the basis of his success when he declared:

I want to thank every man in the surface transportation department for the splendid loyalty and support they have given me at all times. One man cannot run a railroad. We sometimes say we are running it but that isn't true. We must have the co-operation and support of every man in the organization from switchboy to president and unless we have that our efforts to run the railroad to satisfy the public and the management are bound to fail. I have been fortunate in having enjoyed that loyalty and support in a generous degree and I owe all of whatever success I have achieved to each and every one of you.

Changes on Ohio Property

L. N. Bennett, Port Clinton, has been promoted to the superintendency of the Ohio Public Service Company with headquarters in Oak Harbor. He succeeds R. S. Huber, Oak Harbor, who fills another post with the company.

Obituary

George McQuaid

George McQuaid, director of public relations for the Central and South West Utilities Company, an Insull interest, died on March 5 at his home in Dallas. In 1922 he was employed by the public utility organizations of Texas and was placed in charge of the Texas Public Service Information Bureau in Dallas. The bureau issued a weekly news bulletin giving current news and information regarding public utilities operating in Texas. He had been connected with various newspapers in Texas for 30 years serving in different capacities from reporter to managing editor and editor.

The late Mr. McQuaid was born in Virginia in 1875 and was educated at Georgetown University, Washington, D. C., receiving both the A.B. and B.L. degrees. After his graduation he entered newspaper work in Oklahoma and shortly thereafter became managing editor of the Guthrie *State Capital*. Later he joined the staff of the San Antonio *Express* and was managing editor of this paper from 1905 to 1910. His next move was to Galveston as editor of the Galveston *Daily News*. There he remained for three years being forced to give up this position on account of failing health.

After recuperating in El Paso for more than a year Mr. McQuaid went to Oklahoma City as correspondent for the Dallas *Morning News* in charge of the news service in Oklahoma. While in Oklahoma he made a record for building up a news-gathering organization. Two years later he returned to Dallas and was put in charge of the oil development news of the Dallas *Morning News*, serving in the field as oil editor and staff correspondent. He left newspaper work then for about a year but returned as managing editor of the Dallas *Morning News*. This position he held until December, 1921. At that time he purchased the Mexia, Tex., *Evening News* and edited and published that paper until he sold his interests and accepted a position with the Texas utility organizations.

Nels Jenson

Nels Jenson, master mechanic of the Wisconsin Valley Electric Company, Wausau, Wis., and well known in utility circles died Feb. 17. He had been working on Feb. 16. Mr. Jenson entered the employ of the Wisconsin Valley Electric Company in the summer of 1907 and for the past eighteen years had served as master mechanic. He was born in Denmark April 13, 1863. He had been in this country approximately 40 years. Mr. Jenson was known among his associates both in and out of the company as the "Grand Old Man."

Roy Roach, superintendent of the Eighteenth and Olive division of the Kansas City Public Service Company, Kansas City, Mo., died recently. Mr. Roach had been in the employ of the company since January, 1906, serving as trainmen and superintendent at the various divisions. He was born at Everett, Kan., in 1883 and received his early education there and at Enid, Okla. In 1901 he took his first position as a messenger boy for the Chicago, Rock Island & Pacific Railway.

Clyde V. Funk, for 28 years a traveling representative of the Ohmer Fare Register Company, died at Boston, Mass., Feb. 3. Mr. Funk had a wide acquaintance among electric railway and bus officials throughout the country, especially in New England and along the Atlantic seaboard. He was born in Dayton, Ohio, 57 years ago and entered the employ of the Ohmer Fare Register Company during the early years of its existence.

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Manufactures and the Markets

Nashville Railway Improvements

Nashville Railway & Light Company, announces that it will expend about $750,000 in extending and broadening its service in 1928.

More than $100,000 has been set aside for improvements in street railway facilities, safety devices getting a substantial part of the budget. New street paving on the company's street railway lines takes up a large part of the budget, and an automatic railway substation will be installed to give increased power to the Finn Street section of the city.

Public Service and Brooklyn City Order Fare Boxes

Public Service Co-ordinated Transport, Newark, N. J., has ordered 200 Type J electric fare box equipments for its new buses from the Johnson Fare Box Company, Chicago, Ill. The Brooklyn City Railroad of Brooklyn, N. Y., has also ordered 144 Type J electric fare boxes for its regular trolley cars.

Public Service Redecorates Cars

The Public Service Railway, Newark, N. J., has just completed refitting and redecorating the cars operating on the Perth Amboy line. The interiors have been repainted in a cream color and the seats have been reupholstered in leather.

C. E. Beardsley President of Bridgeport Brass

Bridgeport Brass Company has elected Charles E. Beardsley, president of Beardsley & Wolcott Manufacturing Company, as president and director, succeeding Carl F. Dietz. George T. Wigmore, Ralph E. Day, Paul D. Hamilton and Rowley Phillips replaced directors who had resigned. George T. Wigmore was elected treasurer and also succeeded R. I. Reithercut as secretary. Walter Blatz, general manager, retired.

Virginia Electric & Power Company Improves System

Virginia Electric & Power Company, Richmond, Va., has planned expenditures of $4,000,000 for improvements to its properties. $1,000,000 will be spent on rebuilding tracks and paving, shop equipment and improvements to street cars and buses.

Westinghouse Air Brake Report

In the report of the board of directors of the Westinghouse Air Brake Company and subsidiaries, Wilmerding, Pa., for the year 1927 the net earnings for the year, after deducting all expenses, including adequate provision for depreciation of plants and equipment and reserve for federal and other taxes, were $8,520,009.53, as shown by the consolidated surplus account. Of this amount $5,946,223.25 (70 per cent was distributed to the stockholders in dividends and the balance of $2,573,786.28 (30 per cent) was added to the surplus account. This compares with net earnings of $10,535,062.09 in the previous year, dividends of $6,342,099.00 (60 per cent) and addition to surplus account of $4,192,963.09 (40 per cent).

The new car and locomotive orders placed by the railroads in 1927 were less than in any year since 1921, resulting in a reduced volume of business in air brake equipment and locomotive stokers; however, the sales of signal apparatus and train control equipment of the Union Switch & Signal Company, exceeded the figures for 1926, the best previous year in the company's history.

Tests Made to Demonstrate Air-Magnetic Brake

A series of tests to demonstrate the operation and effectiveness of its air-magnetic brake was made by the Cincinnati Car Company on Feb. 21. The demonstration was made on the tracks of the Cincinnati, Hamilton and Dayton Railway, between Hamilton and Trenton, Ohio, under the supervision of the A. C. Nielsen Company of Chicago. A group of approximately 50 operators and manufacturers representatives also witnessed the tests.

The car used was the Cincinnati light de luxe interurban car exhibited at the 1927 Cleveland Convention. A three mile section of track was measured off, the first two miles marked at each mile point and the third mile marked every 50 feet.

The car was started back of the two mile mark, getting up speed, running two full miles and then had the various brake applications made at the beginning of the third mile. The distance required to stop was measured and the time to stop taken. The speed of the car when the brakes were applied was determined by a stop watch and a tachometer.

Two tests were made using the magnetic brake only, two using the air brake only and two using the air and magnetic brakes combined. Then one test of the magnetic brakes, one of the air brakes and one of the air-magnetic brakes were made on a greased track.

The average rate of retardation in miles per hour per second of the two tests made with the magnetic brake only, on dry track, was 1.33 and the average retardation of the air brakes only, was 2.98 while the average retardation of

The Cincinnati light de luxe interurban car used in making the air-magnetic brake tests

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TEST DATA FROM NINE RUNS SHOWING RESULTS WITH (1) MAGNETIC BRAKES ALONE, (2) WITH AIR BRAKES ALONE AND (3) WITH AIR-MAGNETIC BRAKES

Brake Used	Air (Lb.)	Line Volts	Speed at Brake Application Tach.	Speed at Brake Application Stop-Watch	Distance to Stop (Ft.)	Time to Stop (Sec.)	Retardation Miles/second
(1) mag.....	..	573	51.5	51.4	1,623	41.3	1.24
(1) mag.....	..	574	52.0	51.4	1,580	36.0	1.43
(2) air.....	70	...	49.0	48.7	666	16.0	3.04
(2) air.....	70	575	51.0	50.7	752	17.4	2.91
(3) air-mag...	70	575	52.0	52.0	599	13.2	3.94
(3) air-mag...	70	583	51.5	52.2	596	13.0	4.01
*(1) mag.....	69	546	49.5	48.0	1,398	33.2	1.45
*(2) air.....	69	554	49.5	48.0	983	22.5	2.13
*(3) air-mag...	70	575	49.0	50.7	725	15.8	3.21

* Track greased for 800 ft. on last three tests.

COMPARISONS BETWEEN AIR-MAGNETIC vs. AIR BRAKES ALONE AVERAGES FOR TWO RUNS USED IN EACH CASE FOR DRY TRACK)

Brake Used	Speed Stop-Watch	Distance to Stop	Time to Stop	Retardation	Decrease—Air-Magnetic Over Air Distance	Per Cent	Time	Per Cent	Increase in Retardation	Per Cent
(1) mag.	51.4	1,602	38.7	1.33						
(2) air..	49.7	709	16.7	2.98						
(3) air-mag.	52.1	598	13.1	3.98	111	15.7	3.6	21.6	1.00	33.5
*(1) mag.	48.0	1,398	33.2	1.45						
*(2) air..	48.0	983	22.8	2.13						
*(3) air-mag.	50.7	725	15.8	3.21	258	26.2	6.7	29.8	1.08	50.7

* Track greased.

the air-magnetic combination was 3.98.

The decrease in stopping distance of the air-magnetic brake over the air brake only was 111 ft. or 15.7 per cent. The stopping time decrease was 3.6 seconds or 21.6 per cent while the increase in retardation was 33.5 per cent.

On the greased track the increase of retardation was even more pronounced. The retardation of the air brakes only was 2.13 m.p.h.p.s. while with the air-magnetic brakes it was 3.21 m.p.h.p.s., or an increase of 50.7 per cent.

The decrease in the distance to stop by the air-magnetic brakes over the air brakes on a greased track was 258 ft. or 26.2 per cent while the stopping time was decreased 6.7 seconds or 29.8 per cent.

Freight Service Expanded by Interstate Company

Much progress was made by the Interstate Public Service Company, Indianapolis, Ind., during the past year in broadening the scope of territory served with freight service. Through rates and working arrangements were made in connection with the Monon Railroad, the connection being at Indianapolis. This broadened the scope of the territory of the Interstate Public Service Company with through rates and working arrangements of approximately 200 additional towns. The tariff covering this work, to be exact, was effective on Sept. 29, 1927, and for the three months following in 1927 the volume of business handled showed an increase every month. Patrons of the Interstate are very much in accord with this service, as in a great many cases the company is rendering much quicker service in connection with the property and the Monon than they had prior to this arrangement. In addition to this, arrangements were made so that the Interstate Public Service Company is shown as originating, delivering and participating carriers in B. T. Jones' Tariff No. 450, naming class rates between C. F. A. and S. F. A. territory. These rates are to become effective on Jan. 15, 1928, and when once effective give the electric railway through rates and working arrangements with standard steam carriers between points on our property and all points south of the Ohio River and east of the Mississippi.

This is a step in broadening the territory of the electric railway. The feeling is that it will increase the company's business materially, and at the same time assist it in serving patrons a great deal better in the future than has been possible in the past.

Yellow Truck & Coach Moves to Pontiac

The Yellow Truck & Coach Manufacturing Company will begin the complete removal of its general offices and factory from Chicago to the new $8,000,000 plant at Pontiac, Mich., about March 24. The present quarters of the Yellow Truck Company on Dickens Avenue, Chicago, have been leased for occupancy on April 1.

ROLLING STOCK

MONTREAL TRAMWAYS COMPANY, Montreal, Canada, is having an articulated car built for experimental purposes by Canadian Car & Foundry Company. The car will be 81 ft. long with a seating capacity of 90. The leading and trailing trucks will each be equipped with two 42-hp. Westinghouse type 510-A2 motors. It is intended to use the car during rush hours only, and on routes upon which the grades are 6 per cent or less. Delivery is expected in this month.

TRACK AND LINE

PORTLAND ELECTRIC POWER COMPANY, Portland, Ore., will start repairs at once on the electric carlines in the Kings Heights and Arlington Heights district, the city of Portland agreeing to pay the street car company $3,000 since the tracks and lines are owned by the city. The street car company will then lease from the city these tracks and overhead equipment, with the understanding that the service shall be every 30 minutes for eighteen hours a day.

METAL, COAL AND MATERIAL PRICES F. O. B. REFINERY

	March 6, 1928
Metals—New York	
Copper, electrolytic, cents per lb.	13.8375
Copper wire, cents per lb.	16.125
Lead, cents per lb.	5.975
Zinc, cents per lb.	5.85
Tin, Straits, cents per lb.	51.50
Bituminous Coal, f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons.	.....
Somerset mine run, Boston, net tons.	.....
Pittsburgh mine run, Pittsburgh, net tons.	.....
Franklin, Ill., screenings, Chicago, net tons	1.825
Central, Ill., screenings, Chicago, net tons	1.675
Kansas screenings, Kansas City, net tons.	2.125
Materials	
Rubber-covered wire, N. Y., No. 14, per 1,000 ft.	5.30
Weatherproof wire base, N. Y., cents per lb.	16.50
Cement, Chicago net prices, without bags.	2.05
Linseed oil (5-bbl. lots), N.Y., cents per lb.	10.2
White lead in oil (100-lb. keg), N. Y., cents per lb.	13.25
Turpentine (bbl. lots), N. Y., per gal.	$0.64

SHOPS AND BUILDINGS

J. GRAHAM BROWN, Louisville, Ky., will construct a bus terminal in that city costing $100,000. The terminal will serve ten bus companies operating in and out of Louisville, including one direct line to Chicago and another to St. Louis.

CHICAGO, SOUTH SHORE & SOUTH BEND RAILROAD, Michigan City, Ind., has opened its new freight receiving and shipping station in South Bend, Ind. The new station will be a terminal for the company's recently established truck-trailer system of merchandise dispatched in the South Bend district.

TRADE NOTES

WATERBURY CABLE SERVICE, INC., Chicago and New York, has a contract covering installation of subway cables on the line of Brooklyn-Manhattan Transit Corporation, Brooklyn, New York. Work of this kind is a specialty of Waterbury Cable Service, Inc., which contracts for installation of underground cables and the handling of all matters from the time cable is received from the cable manufacturers until it is put into actual use. It also contracts for furnishing and installing street lighting systems complete outside of the central station; the installation of conduits, and the marketing of a number of devices for use in connection with cable networks and distributing systems. Waterbury Cable Service, Inc., is the company of which William O. Wood, formerly president New York & Queens County Railway, has recently been elected vice-president, with headquarters in New York.

TAYLOR ELECTRIC TRUCK COMPANY, Troy, N. Y., has increased the board of directors from three to five. G. A. Tupper, M. B. Taylor, W. E. Taylor, H. M. Dibert and E. H. Betts constitute the board. G. A. Tupper is president, M. B. Taylor, vice-president, and W. E. Taylor, secretary and treasurer.

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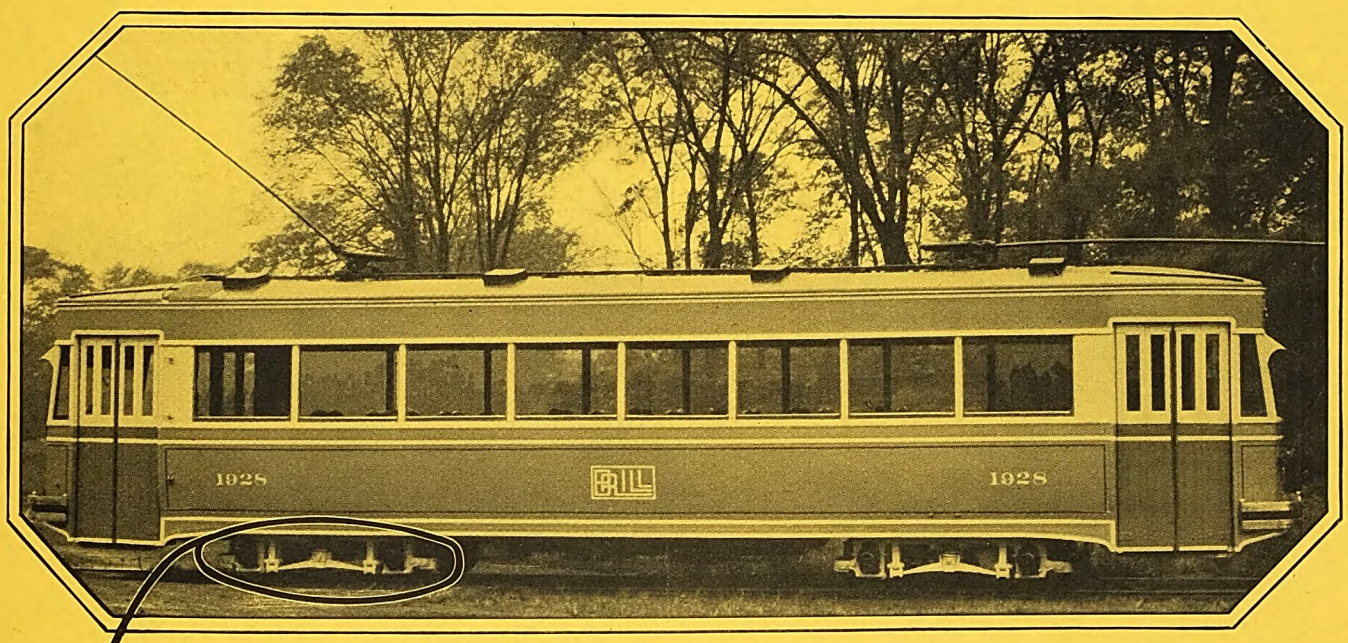
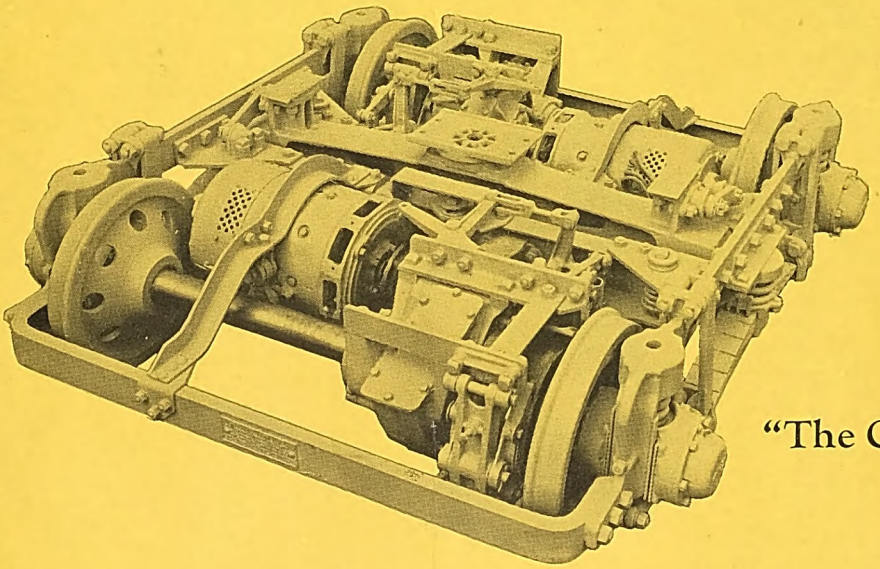


Consider the Brill 277-EX Truck And How It Performs

The primary object in the design of the Brill 277-EX Truck is to reduce unsprung weight and thus decrease the noise of operation without sacrificing strength and superlatively good riding qualities.

Embodied in its construction are solid-forged side frames, recognized for their superior rigidity and squareness; the Graduated Spring System, Half-ball Bolster Guide and Twin Links, distinctive Brill patented features, contribute much to the smooth and comfortable riding qualities of this truck.

The motors are spring supported and entirely independent of the axles. External contracting shoe-type drum brakes are positive in action and aid in reducing noise. In general efficiency, the Brill 277-EX Trucks under "The Car for 1928" are a decided advance and merit the earnest consideration of the electric railway industry.



"The Car for 1928"

THE J. G. BRILL COMPANY
PHILADELPHIA, PA.

AMERICAN CAR CO. ST. LOUIS MO. — G. C. KUHLMAN CAR CO. CLEVELAND, OHIO. — WASON MANF'G CO. SPRINGFIELD, MASS

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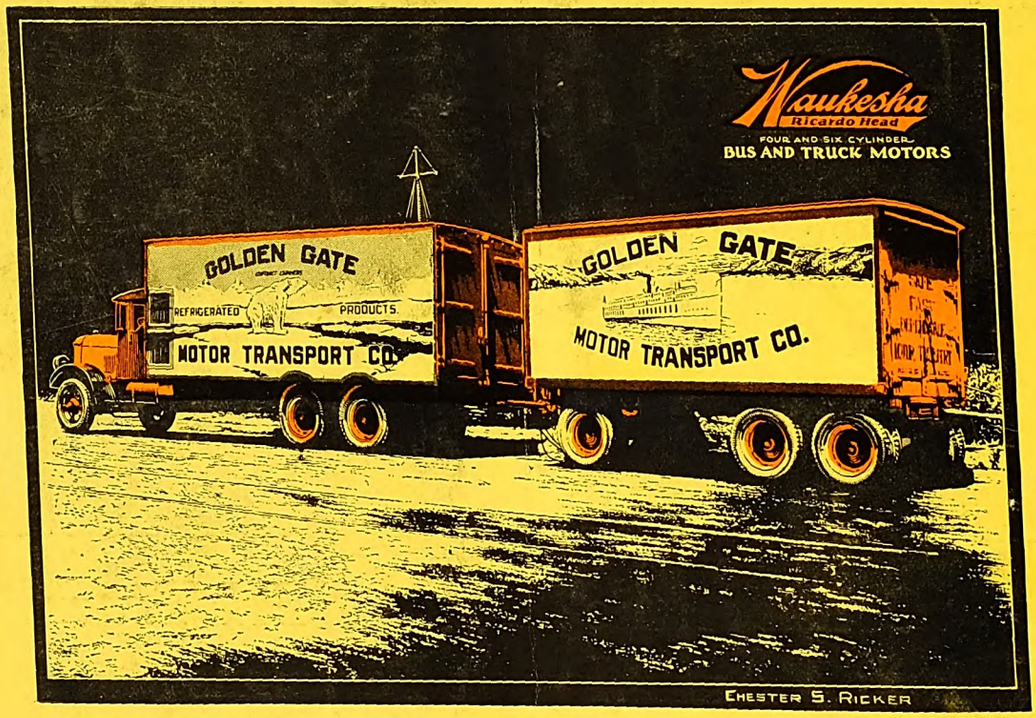
Waukesha-Engined Fageol Trackless Refrigerator Train



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Hauling Gobs' Grub

Fifty Waukesha-engined Fageol trucks are operated by the Golden Gate Motor Transport Co. of San Francisco. These six-cylinder, six-wheel, ten-ton trucks with ten-ton trailers are used to transport perishable foods. Although they are provided with an automatic refrigerating system they must make rapid runs and real power is required to assure "on time" arrival of each load.

Six-cylinder 100 H.P. Waukesha "Ricardo Head" engines are used in these refrigerator Fageol trucks. A. O. Stewart, President of the Golden Gate organization says: "We have been honored with the government contract for all hauling for the Mare Island Navy Yard and the Fageols are serving us splendidly in this work." If you require a heavy duty engine for truck or bus service, you will find a Waukesha available. Seven sizes from 50 to 125 H.P.

(A-805-LC)

AUTOMOTIVE EQUIPMENT DIVISION

WAUKESHA MOTOR COMPANY

Waukesha *Wisconsin*

Eastern Sales Offices — *Eight W. 40th Street* — *New York City*

Exclusive Builders of Heavy Duty Automotive Type Engines for Over Twenty Years

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ANNUAL MAINTENANCE AND CONSTRUCTION ISSUE

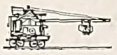
ELECTRIC RAILWAY JOURNAL

McGraw-Hill Publishing Company, Inc. MARCH 17, 1928 Twenty-five Cents Per Copy

LOOK UP! THERE'S POWER OVERHEAD
FOR TRACK CONSTRUCTION OPERATIONS!

Modern production methods demand power—fortunately it's right overhead for paved track construction, and it's free!

Cut out the wasteful labor gangs. Machines will do all the work, better, cheaper, faster.

For the big program take an electric crane a differential car a concrete mixer  a tie layer and a compression tamper. Add to these modern machines, Steel Twin Ties and you're ready to build modern track on a modern production basis. For the smaller program this construction plan can be modified to suit the amount of track to be laid. But no matter how large or small the job, modern production methods and Steel Twin Ties will do a better, more lasting job —and less money will be expended.

Write today for 1928 delivered prices for your track program, giving footage to be constructed.

THE INTERNATIONAL STEEL TIE CO.
CLEVELAND, OHIO

STEEL TWIN TIE TRACK
THE BASE OF MODERNIZATION

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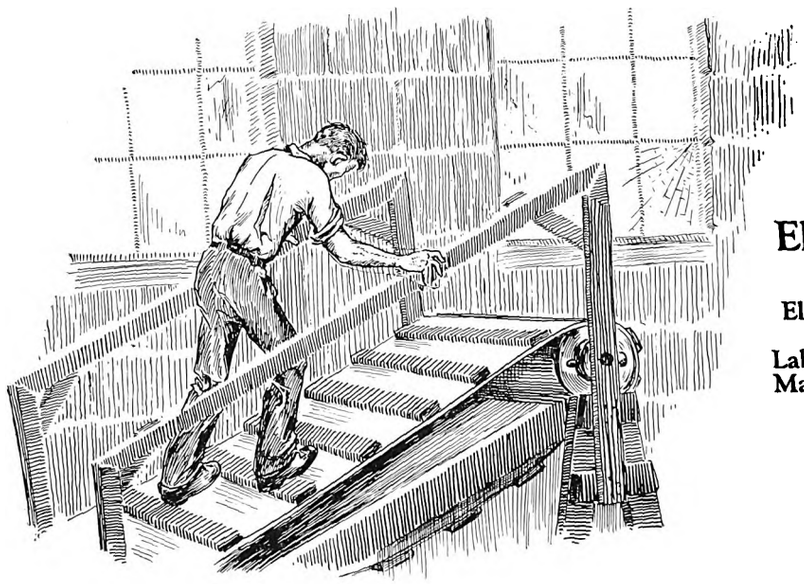
MAINTENANCE LABOR EXPENSE

can be lowered by the exclusive use of the Highest Grade Renewal Parts



Is your labor uphill and getting nowhere?

From the Electric Railway Journal

Electric Railway Maintenance Expense Cars 1927

Labor	$44,952,000—55%
Material	$36,941,000—45%
	Total 100%

Frequent replacement of parts creates an endless chain of labor

Results: 1. Added labor expense.
2. Increased wear of adjacent parts.

Buy only the best renewal parts

Results: 1. Increased mileage between replacements.
2. Reduced labor expense.
3. Lower maintenance expense.

Westinghouse Renewal Parts Reduce Maintenance Costs

Westinghouse Electric & Manufacturing Company
East Pittsburgh Pennsylvania
Sales Offices in All Principal Cities of the United States and Foreign Countries

1928

Westinghouse

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Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review
Published by McGraw-Hill Publishing Company, Inc.
CHARLES GORDON, *Editor*

Volume 71 New York, Saturday, March 17, 1928 *Number 11*

Progress Lags When These Conditions Exist

WHEN one asks the question, "What is the matter with electric railway maintenance?" it seems presupposed that there is something generally the matter. This, of course, obviously is not true. There are many railways that maintain their properties efficiently, and that are keenly alert to new methods and practices that will give improved results. Unfortunately, there are also many instances, particularly among the smaller properties, where several things are decidedly wrong, both in viewpoint and in methods.

First of all, the managements of some railways lack confidence in the future of their own business. Consequently they have hesitated to spend money needed to keep their properties in decent, to say nothing of efficient, operating condition. Cars are decrepit and dirty; the overhead line is subject to frequent breaks; track is bad, and it is impossible to provide a comfortable ride or to maintain a reasonable schedule.

The managements of such properties—and there are far too many of them—must make up their minds or the public will do it for them. A transportation system cannot survive and prosper without the good will of its patrons. That good will and patronage cannot be obtained unless the property can put up a good front. Nothing succeeds like success, and the appearance of failure is soon accepted as evidence of the fact. The physical condition of a property also affects the attitude of its personnel; and thus there is set up a destructive cycle that can have only one inevitable result. The effect of this situation upon the maintenance forces of some properties is nothing less than pitiful. There one finds the type of master mechanic who has patched and scrimped so long that his one remaining hope is that of finding a new job with a management that has confidence in the future of its own business.

In contrast to the road which lacks a leader is the property with surplus shop facilities but inadequate organization, where costs are high and methods inefficient because the man in charge is occupied with other matters than his primary responsibility—maintenance. The problem is one of organization and general policy.

Finally comes the property on which the maintenance executive is self-sufficient and the methods and costs are clothed in secrecy. Little interest is taken in what others are doing and pride of authorship is the dominating impulse. Comparisons of costs, of pull-in records and of track failures with other properties, when they are made at all, are set up not for the purpose of self-improvement but as evidence to make an impression on the management.

In effect these constitute the three general classifications of the answer to the question "What is the matter with electric railway maintenance?" Progress lags when any of the conditions outlined above exists on a property. These are all matters for the attention of the management, for upon the elimination of these conditions depends the improvement of maintenance practices throughout the industry.

Adequate Facilities and Careful Preparation Needed to Secure Good Painting

SUCCESS with any system of painting depends on the care used in preparing the surfaces to be painted and the attention paid to putting on the various coats. Paint is used for two principal reasons; first, as a protective coating to prevent rapid deterioration, and second, to give a good appearance.

Paint or enamel may be put on by brush, spray or dipping. Each has its place and its limitations. Regardless of which process is used, however, too much emphasis cannot be laid on the proper preparation of the job and the correct application of the under coats. Unless the surface and under coats are right the finish coats will fail, no matter how good the materials. Good results can be obtained from a number of standard painting systems, if proper precautions are taken. All sappy spots in the wood should be carefully shellacked. Cleanliness is a prime requisite. Surfaces should be cleaned thoroughly before any painting is done, and metal surfaces must be brushed off to remove rust. To insure a good job sufficient time for drying must be allowed between coats and after the final coat. Many details of shop facilities affect the cost of painting and the character of the finished job. Rolling steps and scaffolding that are easily and quickly adjusted will help speed up the work Adequate lighting is most essential.

Touching up and patching have assumed greater importance due to increased street congestion. Painted surfaces are subjected to frequent scratching and damage. This has led some to advance the suggestion that an extremely long life for the painted surface is not desirable since it will soon be scratched and marred anyway; and so in order to make a good appearing job it will be necessary to paint cars at least once a year.

Car cleaning methods and materials have an important bearing on the life that is obtained from paint. In modern cars steel is used extensively. The many pockets, window corners, etc., accumulate dust which retains moisture and leads to rusting. In the campaign for better appearing cars much attention has been given to various color combinations and cars are being repainted much more frequently than in previous years. Regardless of the particular painting system used, the whole question of satisfactory results is coming to involve more and more consideration of the conditions under which the paint is applied and handled.

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Cheap Products Make Expensive Repairs

CONTINUITY of service is the first requisite in the transportation business. It is an old saying that a standing car earns no dividends. Freedom from breakdowns on the road is the greatest factor in keeping the cars moving, and so should be the goal of everyone connected with maintenance work, from the laborer up to the general manager and even to the board of directors. In the very nature of things it cannot be otherwise, for no public utility can hope to survive long unless it gives that character of service the public has the right to expect.

The greatest factor in preventing breakdowns is in doing the work of maintenance as it should be done. It is not enough to patch up a defect so that the car or bus can go out on another trip. It is necessary to know that it can go out and make many trips without the ever-present danger of a failure on the road. When a maintenance executive is choosing between methods or materials he should always keep in mind this need for reliability. Particularly in the purchase of parts and of supplies there is an ever-present temptation to shade off the price. When the salesman tries to sell an article on the basis of price, and still claims that the quality is identical, it is well to keep in mind the slogan adopted by one prominent advertiser: "You can teach a parrot to say, 'Just as good.'" Unless it is a staple product where the quality is invariable this slogan may be remembered to advantage. Even here there often is a chance for shading in one way or another.

The first cost of the best materials and the most efficient labor is not so great as often is imagined. Substitutes seldom have the quality of the original product, no matter how hard the salesman tries to convince the purchaser. Of course, it sometimes happens in the progress of the industry that materials and parts available when the original equipment was built were not as good as those available today. There should be no hesitation in adopting the new and better part if it will increase the reliability of the service. Oftentimes serious defects in the original design have been eliminated in this manner by the railway's maintenance forces. There may also be a chance to reduce the cost of the repair in this way. But there should be no tendency to cheapen the method or the quality of the products used.

Permanent Track Repairs Economical in Long Run

NEARLY as much money is spent each year by the electric railways for track maintenance as is spent for track reconstruction. There is, however, an important difference between the expenditures for the two purposes. Maintenance expenditures are spread over a large number of small jobs no one of which costs very much, while track reconstruction expenditures are made for only a comparatively small number of jobs, each of which is fairly costly and usually is covered by a specific authorization. The result of this situation is that maintenance jobs often receive less engineering attention than do reconstruction jobs, and much good money is wasted in unscientific repairs.

Joints ordinarily are the largest item in track maintenance. Strangely enough, many electric railways follow the same practice in joint repairs today that they did twenty years ago, although they certainly would not use in new construction the same methods that they used ten or even five years ago. Following old maintenance methods is largely the result of a false idea of economy. Although figures differ considerably in various cities, it may fairly be said that it costs about $50 to open up a joint, repair it and restore the pavement. While the work is open the cost of a permanent repair is only a few dollars more than that of a temporary repair. If the repair is not made permanent it will not be long before the pavement has to be opened up and the work done over again; yet many railways continue to make temporary repairs on the assumption that they are economizing. They will open up the joint and make a repair which may last only a year, at a cost of $50, while a permanent repair can be made at a cost of perhaps $60 or less, that would last for many years.

Many other instances of this sort might be mentioned. Temporary repairs to special track work are frequently made with similar false economy. During the course of a few years a railway may spend far more than it would cost to do a good job in the first place—more sometimes than it would cost to install new special work. The idea seems to be that "it's just a small job and we'll do it as cheaply as possible." There is a tendency to forget that the real cost of any track job is measured by the length of time it lasts. Since the total annual expenditure for maintenance is nearly as large as that for track reconstruction, it is obvious that higher standards of maintenance practice offer the opportunity for economies comparable to those which have been effected through improved construction methods.

Deferred Shop Improvements Lead to Bad Practices

IMPROPER facilities in the electric railway shop decrease the quality and increase the cost of railway maintenance. Poor equipment and improper arrangement of working appliances increase the length of time required to make a repair while untidy and uncomfortable surroundings reduce the morale of the entire crew. A dirty and untidy shop cannot keep high grade mechanics.

Will a man inspect a controller and make with his bare hands the close adjustments that are necessary, when the air is so cold they are numbed; or will he spend the proper amount of time and do his work carefully under the car when he is standing in a muddy pit, timbered with rotting boards? Undoubtedly he will not. Neither will he work properly in dark and dingy places.

Some properties require their men to work in barns, not car-houses. Not only are the general working conditions poor but often the tools and equipment have long since ceased to be usable. How can a man tighten a bolt properly if the wrench refuses to grip or has a handle too long or too short? How can accurate machine work be done on second-hand machine tools that have been discarded by others but purchased by electric railways that won't spend the money needed for efficient machines? These conditions soon grow on the foreman as well as the individual workman. The men must then work, not only under bad conditions but without a leader to set a proper standard.

Lack of tidiness has a similar effect. Men cannot work in a greasy cluttered up shop any better than an executive can work in a dingy, messy office. Materials should be properly stored and such things as castings, wheels, lumber and scrap should be in their proper places and not form part of a general clutter. Scaffolding and ladders should be of proper design so as not to hinder

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the worker and should be convenient for handling. The pit construction should be open and kept clean.

The average workman can be led to take sincere pride and interest in his job, provided he is given proper encouragement. But no man can do good work with poor tools or in uncomfortable or dirty surroundings. There are too many instances where financial difficulties, franchise problems or other unfavorable general operating conditions lead to the total suspension of all shop and machinery improvements. Then, when a reorganization is completed or a new franchise arranged, the pendulum swings to the opposite extreme, a very elaborate shop is built and, to utilize these facilities, the property embarks on a program of home manufacture that is open to serious question. What seems to be most essential is a better understanding of the need for gradually improving maintenance facilities as a means of effecting operating economy. Regardless of how hard pressed a property may be financially, appropriations for needed maintenance improvements must be given attention. Any other policy is obviously false economy.

Attention to Detail is Secret of Freedom from Electrical Troubles

IT IS probably generally agreed among maintenance men that the electrical equipment is the very heart of the electric car, and that freedom from electrical failures is essential to a favorable pull-in record. That being true, one would expect to find that the maintenance costs and troubles on a property are in inverse proportion to the age of the electrical equipment on its cars. Other things being equal, that should naturally follow; and it does follow where the standards of maintenance procedure are comparable on two properties.

Unfortunately, however, there is a wide diversity of maintenance procedure and standards, and one sometimes finds that the property with comparatively modern electrical equipment does not show in full the favorable record of service failures and maintenance costs which is to be expected. What then is the explanation? One does not need to go far for the answer; it can be summarized almost in one word, "thoroughness." Particularly with respect to the maintenance of electrical equipment, attention to detail is the secret of low costs and freedom from service failures.

Examine the practices of the properties that are making the best records on pull-ins and equipment maintenance costs, and one is immediately struck with the care that is exercised in the overhaul of electrical equipment. The parts are stripped from the cars so that they may be thoroughly examined, cleaned, reinsulated if necessary, and tested to make sure that they will stand the same degree of abuse as when they were received from the factory. This applies to motor field coils, armatures, controllers, line switches or circuit breakers, and motor leads. Each of these parts is carefully cleaned and is inspected and tested on the assumption that it conceals a potential service failure. Then it is reinsulated either by merely dipping and baking or by actual replacement of insulation where deterioration is evident. Finally, after the parts are again completely assembled, they are subjected to severe tests in the shop, designed to bring out any hidden weakness before they go back in service.

Of course, on some properties, where the practice of repairing failures has been continued for many years in place of a policy of anticipating and preventing them, the condition of electrical equipment is such that the adoption of a thorough overhauling policy like that outlined above, will cause a temporary increase in maintenance expenditures. But it has been amply proved by the records of properties that have stuck to this policy for several years after once adopting it, that the money spent for putting electrical equipment into good condition is an over-all economy. It is far cheaper in the long run, to anticipate failures rather than to repair them after they occur. Attention to details while the equipment is in the shop for overhaul is the secret of the success of those properties that show consistently favorable pull-in and maintenance cost records.

Close Supervision Essential in Maintenance Departments

ONE trouble with many maintenance shops is that the man at the head of the organization does not really know what is happening in his own department, and among his own workmen. Instructions are issued, but the several departments are not followed up by the man in charge to see that they are carried out. Instructions or orders do little good unless enforced. The maintenance executive is frequently too far out of touch with the practices of his own department to give that quality of executive supervision upon which the performance of his whole department depends.

To get real results from the men actually doing maintenance work requires that the advantages of any improved practice be "sold" to them through their foremen. All doubts that may arise in the foreman's mind as to the desirability of using a particular method or material must be removed at the time that instructions are issued. Ideas are hard to transmit, and for that reason, the complete execution of a policy is achieved only when the head of the department keeps closely in touch with what is being done and with the men in charge of the work.

Some busy executives feel that they do not have the time to maintain direct contact with their forces, or with the work which is being done. This is usually a result of inadequate organization or of an improper conception of the maintenance man's responsibility. Executives should take the time necessary. Direct supervision of shop and carhouse methods is of more importance than the affixing of signatures to reports and documents where the signature of a subordinate would do just as well. Sometimes the lack of proper supervision is attributable to the fact that much of the executive's time is occupied with matters involving the manufacture of parts or equipment on the mistaken theory that an economy is effected. This is probably the chief indictment against "home manufacture"—it occupies the time and attention of the limited supervisory staff at the expense of maintenance.

Along with proper supervision must go recognition of satisfactory work done by individuals. Stimulation of initiative and enthusiasm is possible only when the head of a department has direct contact with the men on the job. Keeping equipment going after it is built has a tendency to become monotonous. Such routine operations as turning wheels, packing bearings, adjusting brake rigging, slotting commutators, tightening track bolts, splicing trolley wire, etc., enlist little enthusiasm unless each man's part in the operation of the property is kept constantly before him. When he is made to realize that inspection is for the purpose of avoiding service failures, and that a car pull-in is a serious matter, his part in the company's success takes on increased importance.

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Maintenance Practices That Permit

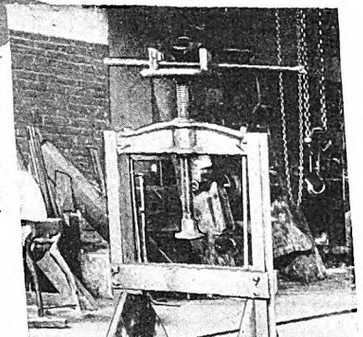
Failures Cost Money

Close supervision, high-grade workmen, modern tools and good materials are necessary. With any of these lacking, improper practices will creep in

By Clarence W. Squier
Associate Editor *Electric Railway Journal*

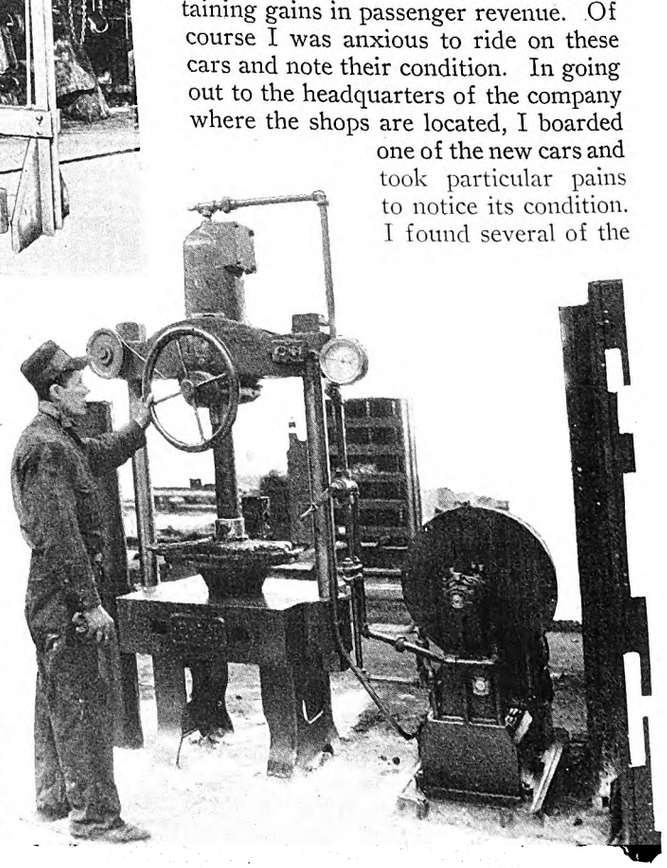
The practice of driving bearings into housings is wrong—too much force may crush the bearing and cause it to pinch the shaft—A loose bearing soon wears on the outside and damages the keyway

WHILE making a recent survey regarding gaging of wheels the writer visited a number of railways to obtain information as to just what variation was allowed and how closely their wheels were kept to gage. On one property the master mechanic told me that all wheels when tested were exactly to gage. I replied, of course, that there must be some variation, as it was impossible to bring them all to exact measurements, and there must be allowed a certain tolerance. He said, no, there was no tolerance allowed and suggested that we go out and check some. We measured the gage of a number of wheels in the shop which had recently been pressed on their axles. We found a variation of as much as $\frac{1}{4}$ in. either way from correct gage. He was quite surprised, so we watched the workman who was pressing on the wheels. After he had pressed the wheels on we asked him to test the gage again. Looking at the measuring gage he used I noticed it had a spring attachment at one end. Asked the reason, he said that with a stiff gage if the wheel was pressed on a little too far the gage would be bent or broken, and so might become distorted easily. In order to prevent this he had placed the spring attachment on the end so that if the wheels were pressed on too far the spring would be compressed and do no damage to the gage. He evidently had overlooked accuracy, for the spring attachment allowed considerable play and the gage itself was very inaccurate. Here the master mechanic, who was passing the wheel press constantly, did not know the situation in his own shop.



A bearing press without a gage is little better than the sledging method

One of my visits was to an interurban property where some light interurban cars had been placed in service about a year previously. These cars had been admired as a long step forward in providing passenger comfort and convenience, and the road had been obtaining gains in passenger revenue. Of course I was anxious to ride on these cars and note their condition. In going out to the headquarters of the company where the shops are located, I boarded one of the new cars and took particular pains to notice its condition. I found several of the



A modern bearing press in the Coney Island Shops of the B.-M. T. The gage shows the pressure obtained

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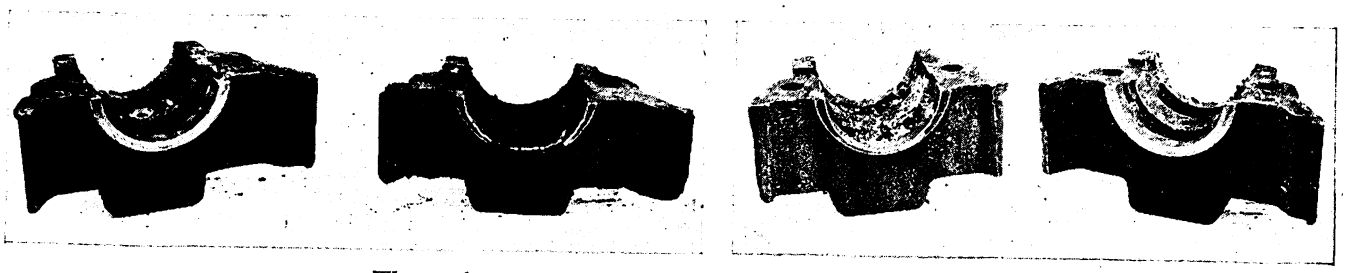


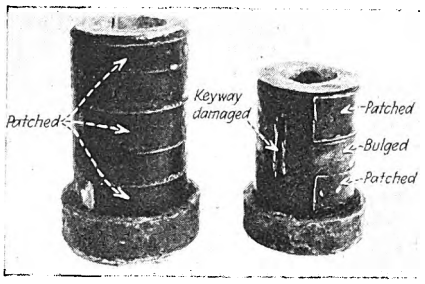
Worn axle caps are a source of danger. Two of those in the illustration are worn more than 1/2 in.

heaters under the seats were loose. Screws had come out and no attempt had been made to fasten them, so the heaters were shaking and making a disagreeable noise. Also, some of the arm rests of the seats were loose, which did not add to the passenger's comfort, as they were intended to rest his arms on rather than to be a source of annoyance.

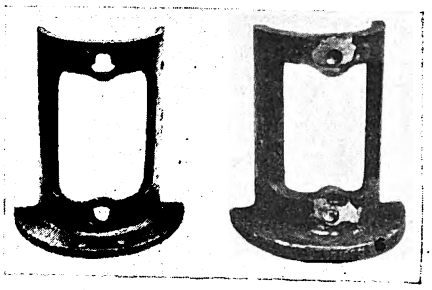
Many other things about the furnishings were in a slipshod condition. While they did not actually interfere with the operation of the car, they gave it an untidy appearance. About halfway to the shop, we came to a siding where a car coming in the opposite direction was off the track. I got out to see what had caused the trouble and noticed that the wheel flanges were very sharp. I then looked at the wheels on the car on which I was riding. These also were sharp. Evidently no attention had been given to the replacement of wheels.

When I arrived at the shop I was not surprised that so little attention had been given to maintenance of the equipment. This particular day was raw. Snow and rain were falling and it was very disagreeable outside. In the shop I found conditions even worse. The pits were just holes in the ground; they were not cemented and the bottoms were filled with mud and water. There were a few lamp outlets along the edge but only about half of them were working. There was no wheel press and no lathe for turning wheels. All this work, I learned, was expected to be done outside. I asked the master mechanic if he was paying any attention to the wheels. He said that he had noticed the flanges were getting very sharp, but the general manager had discouraged sending the wheels away. I told him of the derailment and that evidently this was caused by sharp flanges. He said that perhaps a couple of accidents would impress upon the management the necessity of doing something immediately. This situation was very bad, as some extra fine equipment was allowed to get into bad condition through improper attention to maintenance details.

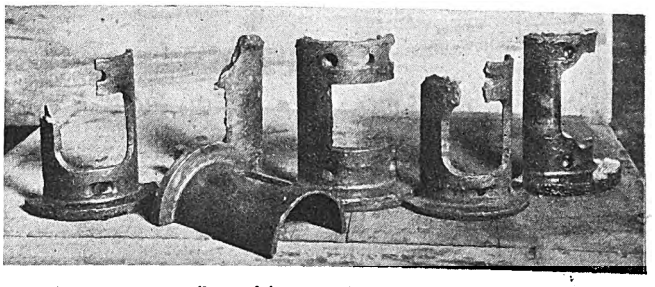
Later this road replaced all of its wheels and in doing so increased the diameter from 26 in. to 28 in. so as to get more mileage from the wheels. The value of low step height, which featured the original design, was forgotten.



Dreadful examples of armature bearings —bulged walls, patched and keyways destroyed



Loose axle bearings cannot be held satisfactorily by dowels. They soon break out



Constant pounding of loose axle bearings soon results in conditions like this

Something About Rewinding Armatures

Speaking of antiques in America, I am reminded of a curious method of winding armatures which I happened to see on one of my visits not long ago. It was in connection with an old motor, so I asked a lot of questions. The workmen were insulating the pinion-end coil support of the armature and were following almost to the letter the original practice. On this particular motor layers of insulation were built up to give the required thickness to fill the space up around the coil. The workmen were using a heavy fibrous paper cut to the required width and length and slotted to conform to the curvature of the armature. To make the paper pliable it was soaked in water and while still wet it was placed on the coil support. Before the paper had a chance to dry out it was shellacked to hold it in place. Just imagine what a nice damp place the armature coils had to rest on and the steam engine effect when the motor went into operation! A property of this kind offers a fertile ground for an engineering investigation.

Another practice which should be relegated to the dark ages is that of cutting out armature coils to avoid rewinding. On one of my visits I asked the superintendent of equipment to show me how he would cut out an armature coil. He looked at me with a merry twinkle in his eye as he said, "Of course, we would only allow such a thing as an emergency measure and see that the car was operated in light service. This practice should be placed among the lost arts, but still there are few armature winders but who know the process well." We then went into the shop and inspected the armature room. Strange to say, the armature foreman was having a coil cut out. The particular armature involved was reported in for an open circuit. Here is the process which was followed: Alcohol was poured in the slot and

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ignited to soften the insulation so that the coil could be lifted with a minimum of damage. After the coil was raised out of the slot the insulation was stripped off and the open coil located. The ends of this coil were cut off short and taped. The coil was then wound to its approximate shape, reinsulated, and pushed back in the slot. On questioning, the foreman admitted that sometimes as many as three repairs of this nature were made on one armature before it was rewound. Yes, he said, the motor did flash some, but he thought that this procedure reduced maintenance expense, as it saved the price of a new set of armature coils. Can you imagine the expense of removing the armatures from the car, the possible delays in car service, and the general foolishness of the whole procedure?

A Coat of Varnish May Cover a Multitude of Sins

Impregnation of field coils has become an accepted practice by most electric railways. On one property the master mechanic told me about certain economies which he had introduced so as to cut down the time used in impregnating his field coils, and so get the repaired motor back in service sooner. I asked if he was sure that he had not injured the quality of the product, and requested him to have one of the coils opened up. This coil was a revelation. The impregnating compound had not penetrated below the first two or three layers. The inside of the coil was white, indicating lack of treatment.

Anyone knows that if it takes ten operations to do a job right the use of only five of the operations will result in a lower-priced product with a corresponding inferior quality. Poor treatment of field coils results in breakdowns from moisture. Low-grade insulating materials and skimping of the required amount results in breakdowns, expensive delays and costly repairs.

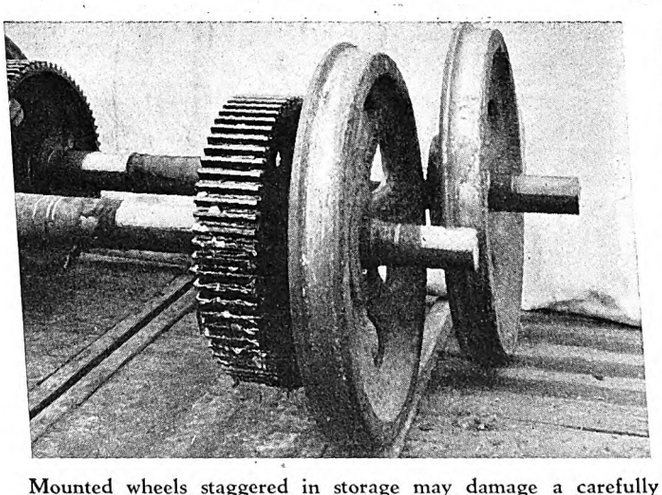
We have heard much about the damaging effects of spread gear centers during the last five years. Superintendents of equipment have attended various committee meetings and discussed the subject; these men, together with their general managers, have visited conventions and listened to papers on the subject, but so far as doing anything on their properties, well, they have promptly forgotten about it. When you talk to these men they all admit that spread gear centers are an evil that should be remedied, but they are almost always of the opinion that such a condition does not exist on their property until they are actually taken out and shown.

How can it be demonstrated that a spreading of gear centers actually exists? One of the easiest methods is to open the trapdoors over the car motors so that their action can be watched, then set the brakes and apply power to the motors by notching the controller on and off the first point. Excessive movement, if noticed, can be accounted for only by excessive wear in axle bearings, between the outside of the axle bearings and the axle cap, between the armature housing and the motor frame, between the armature bearing and the housing, or in the bore of the bearings themselves. As most of the wear of axle bearings is in the top portion, a common method of testing is to lift the motor at the axle suspension by means of a pinch bar. While this is being done, inspection will show how excessive is the movement.

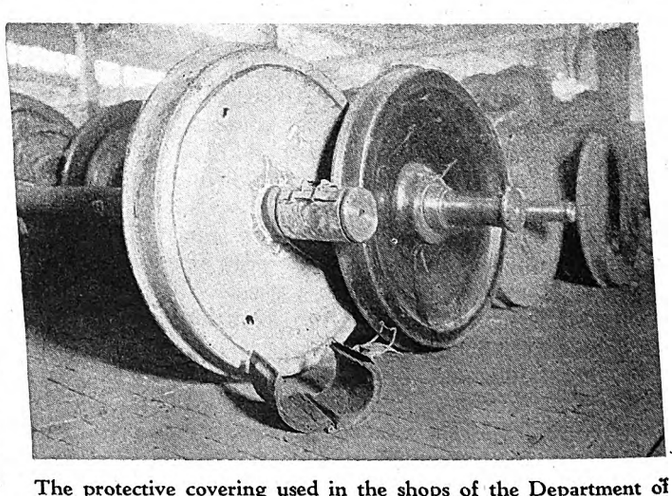
Superintendents of equipment and master mechanics, when asked why they do not remedy these conditions, are likely to give lack of funds as one of the first excuses. They say that if they asked the general manager for money he would immediately turn them down. In order that these men may have some sort of a report to present to the general manager and so convince him of the bad condition of rolling stock, it is desirable to make a test as outlined on all equipment and report the number of cars and equipment showing excessive wear. Of course, such a report should recommend means to remedy the trouble, and include a summary of costs. Axle bearings and the bearing fit of the axle bearing in the motor frames are the worst offenders as they do not receive the close attention that the armature bearings do. Of course, the wear inside the bearings can be taken care of readily by fitting bearings to the axles, and truing these up to proper dimensions.

A common practice is to replace axle bearings at the carhouses whether or not they are held tight by the motor and caps. No check or attention of any kind is given to this important repair and the axle seats are not examined. As long as they run, they are left alone, and attention is given them only if some part of the bearing breaks.

Electric railway managements can see the extent of this evil by requiring that the bearings removed be held for inspection. Then the reason can be determined why the bearings were replaced by new ones.



Mounted wheels staggered in storage may damage a carefully finished journal or axle bearing surface by rolling the flanges against the axle seats



The protective covering used in the shops of the Department of Street Railways, Detroit, Mich., prevents damage to journal bearing surfaces and keeps them clean

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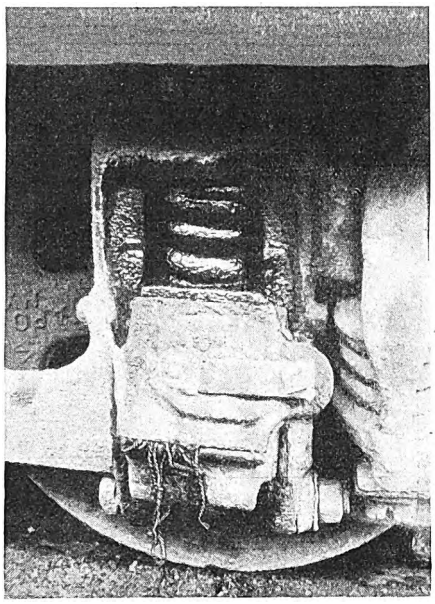
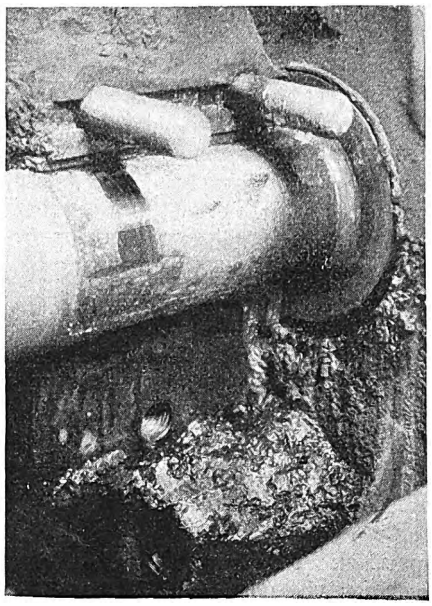
A journal box cover carelessly left partly open may soon result in contamination of packing and oil and bearing failure



Strands of waste hanging outside journal box may soon siphon off the oil and result in a hot bearing

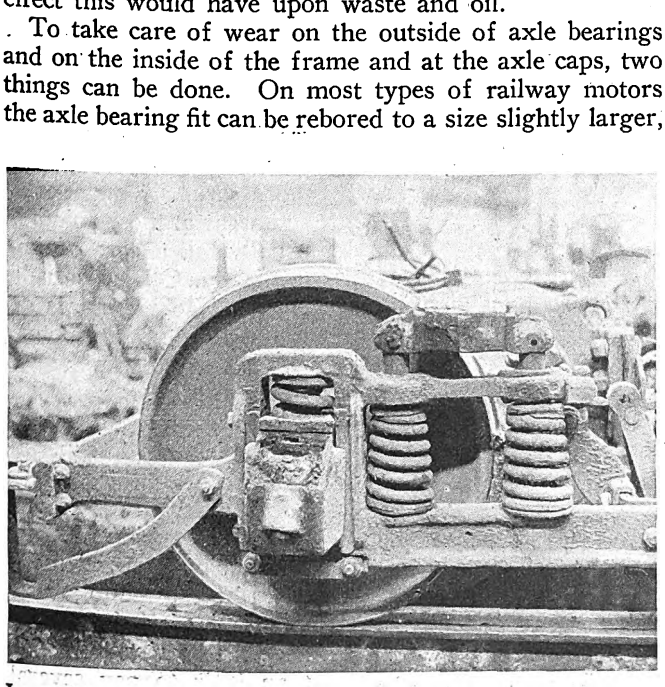


This shows where much of the gear grease goes. More attention to gear case fitting and axle collar will pay

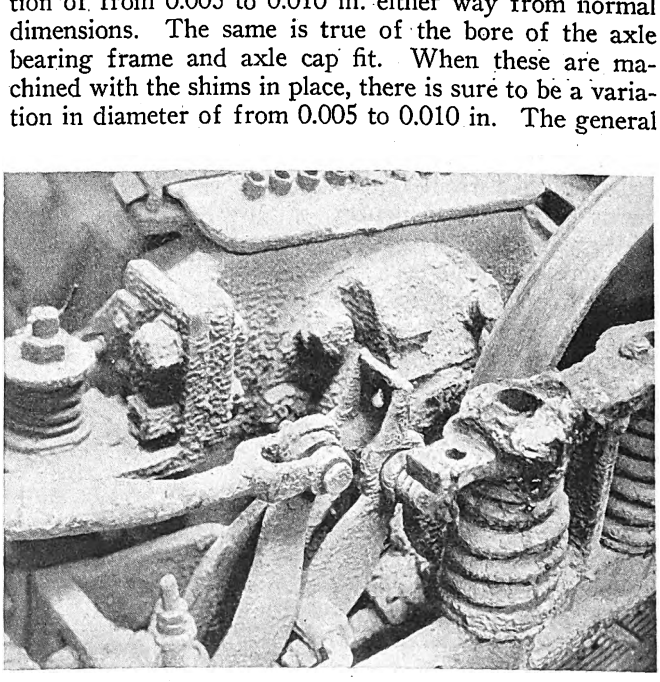
In the course of time motors are welded and rebored because the fits have become so worn that they can no longer hold a bearing and the mileage obtained from the bearings drops to from 5,000 to 10,000 miles. Managements will find it a paying investment to check such conditions at once. It should be ascertained if new bearings when put in motors are tight after the cap is bolted up. Put a set in a motor that is standing on the shop floor and hit it with a wooden mallet. Then take the same motor when it has been placed in a truck and use steel feelers to determine clearances between caps and bearings, also between the bearing and the axle seat. A good strong electric light will help materially in checking clearances. Remove the waste from the axle cap and throw water on the end of the bearing to see what effect wheel wash will have. See how much water enters the caps and what effect this would have upon waste and oil.

To take care of wear on the outside of axle bearings and on the inside of the frame and at the axle caps, two things can be done. On most types of railway motors the axle bearing fit can be rebored to a size slightly larger, probably not more than $\frac{1}{16}$ in. Then oversized axle bearings will give the desired fit. Where the wear is so great that reboring may lessen the strength of the motor support at that point, the best practice is to build up the inside of the frame and axle bearing by welding and then re-machine to standard size. Much of this excessive wear and looseness at the axle bearing support is a direct result of improper use of the clamping fit provided, for originally the axle caps were bored out with shims between the frame and the surface. When bearings were installed and these shims removed the desired clamping is supposed to have been obtained.

The trouble that comes from this practice is due to variations in machining. Suppose the outside of an axle bearing should be 7 in. It may vary a few thousandths from this. Most railways accept bearings with a variation of from 0.005 to 0.010 in. either way from normal dimensions. The same is true of the bore of the axle bearing frame and axle cap fit. When these are machined with the shims in place, there is sure to be a variation in diameter of from 0.005 to 0.010 in. The general



Journal box covers knocked off in service give no protection to the oil and packing. Clean oil and waste are essential if the number of hot bearings is to be reduced



Railway motors are subjected to extremely dirty conditions. Covers should be kept tight and never opened until the surrounding mud has been cleaned off

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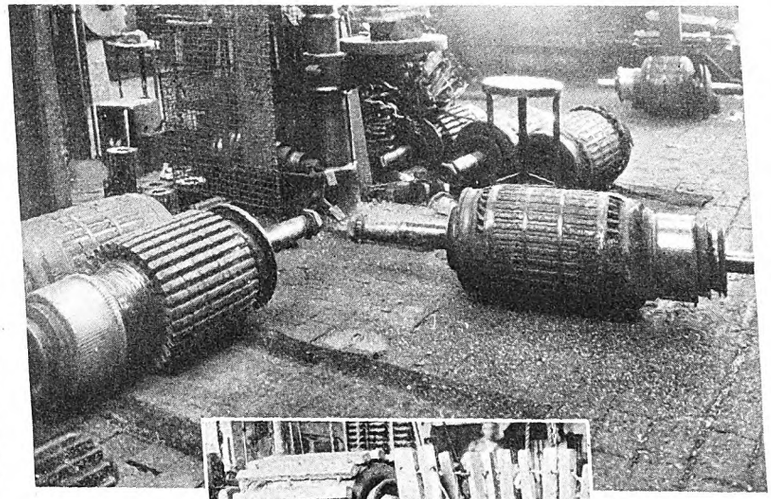
practice is to use shims of a thickness to take up approximately from 0.014 to 0.017 in. When these are removed, there are sure to be variations in the fit. On some, the clamping will be excessive, and others will actually be loose at the start.

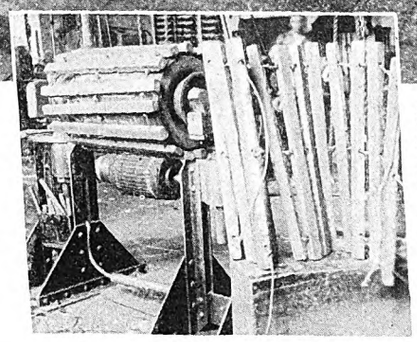
How can this condition be remedied? In the first place, for all axle bearings a machining tolerance of from 0 to plus 0.005 in. should be specified. No axle bearings should be accepted if the diameter is less than normal. In the same way, the machining tolerances for the bores of the frame and axle cap or the axle bearing fit, should be from 0 to minus 0.005 in. and none with greater than the normal bore should be accepted. A clamping action is then sure to result, and the maximum variations in the clamping will be from 0.010 in. down to normal. With these machining tolerances, distortion of the bearings from excessive clamping will not result, so there will not be danger of bearings running hot due to their being decreased in the bore by tight clamping fits. To obtain co-operation of the management in making a thorough rehabilitation of equipment, master mechanics should get the results of their inspections forwarded to the manager's desk. They should be sure that the reports tell fully what is needed to bring the motors back to a satisfactory condition. At the same time it will probably be advisable to ask for proper tools and some facilities to carry on this work. At the start recommendations for improvements should be made which eventually may lead to better work.

Much of the argument given for axle bearings is equally good for armature bearing fits. The trouble there is not so great since they are watched more carefully and excessive wear at these points is usually taken care of immediately. Otherwise, rubbing of the armatures on the pole faces of the motors and damage to windings is sure to cause large expenditures. As a result, master mechanics and superintendents of equipment have no difficulty in keeping these fits within desired limits, since general managers have come to realize that it is far cheaper to keep the bearings in shape than it is to pay several hundred dollars for rewinding an armature.

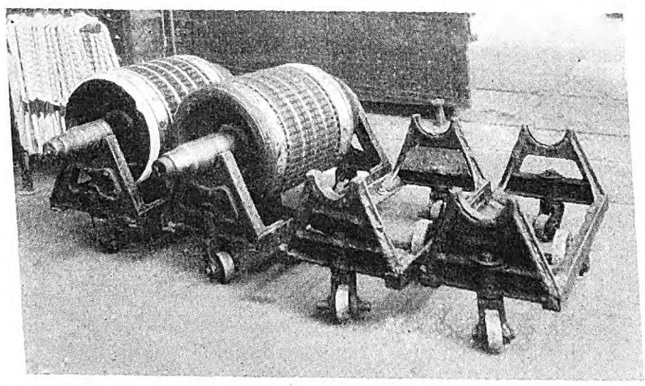
One of the greatest



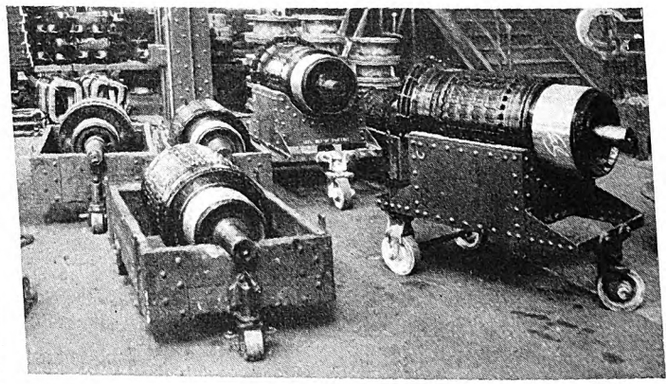
Storage or placing of armatures near machine tools is dangerous—Turnings or drill chips may cause a short circuit or grounded coil in service



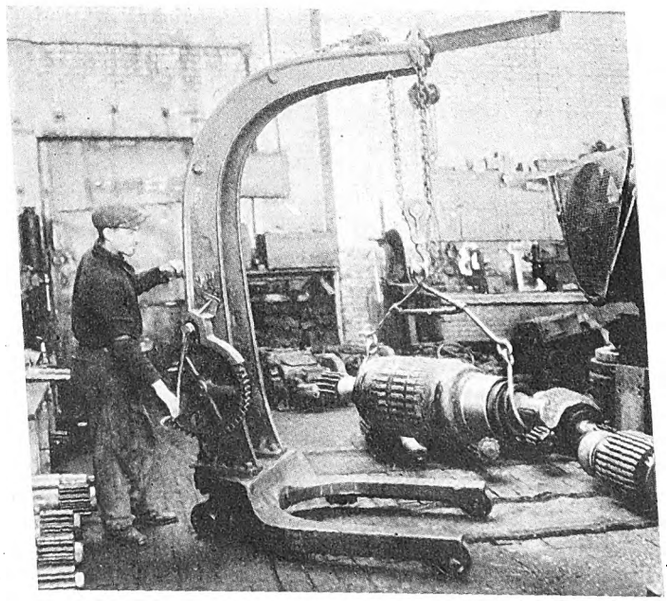
As shown at the left, the New York Railways protects armatures with a wooden harness consisting of strips held together by rope



Armature buggies form a convenient means of transporting and protecting armatures in shops of the Brooklyn-Manhattan Transit system



Large armature trucks in the Coney Lsland shops of the B.-M. T. Company. Several of the steel trucks at the right are hauled between departments at one time by a shop tractor



The Eighth Avenue Railway uses a portable crane of this type for handling armatures about the shops

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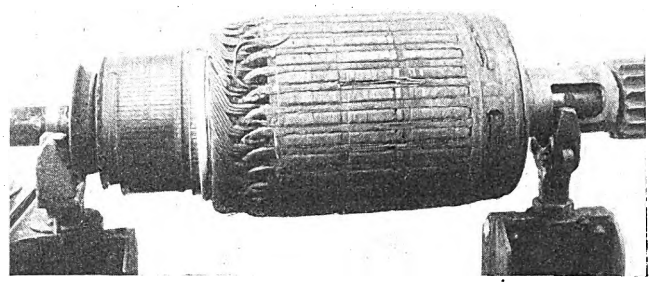
sources of difficulty with armature bearings is due to their being placed in the housings loose, or else driven in with too great pressure. This will not happen if every shop has a press with a gage on so as to show the exact force with which armature bearings are pressed into the housings. Manufacturers of the bearings have issued instructions giving the proper force with which bearings should be pressed in. A maximum of 5 tons, and a minimum of 3 tons is good practice for bearings of ordinary size. In visiting various railway shops I have found the most general practice is to drive these bearings in with a mallet. Where there are presses, many are not provided with gages and no attention is paid to the proper pressure.

Contrast this procedure with that used in wheel pressing. On every electric railway the wheel press is provided with gages. Pressures for putting on wheels are watched very closely. If excessive, the wheel is pressed off and the trouble is found immediately so that the pressure will be kept within the desired limits. Graphic records of pressures for fitting the wheels are sent to the office of the superintendent of equipment, and sometimes to the general manager's office for his information. They are scrutinized carefully, and any wrong practice is immediately checked up and the foreman warned. A similar system should be adopted for armature bearings. A record should be kept of the pressure at which each armature bearing is put in. Copies of the records should be sent to the offices of the superintendent of equipment and the general manager. It will thus be evident to all concerned what pressure is being used, and the cause of a loose bearing or a tight bearing will be easy to locate.

I have seen cars with newly-equipped armature bearings placed in service and run less than a single trip before overheating resulted so that it was necessary to turn the car in. Examination has shown that such bearings actually were distorted due to pinching while being driven into the housing. This caused the hot bearing. On one system where it is the practice to spin every motor after new bearings are installed, I asked the superintendent of equipment to flood the housings with oil and run each motor for ten minutes and observe the results. The third motor tested developed a hot bearing. It could not be laid to lack of lubrication since the bearings were flooded with oil. On removal the bearings were found distorted, pinching the shaft.



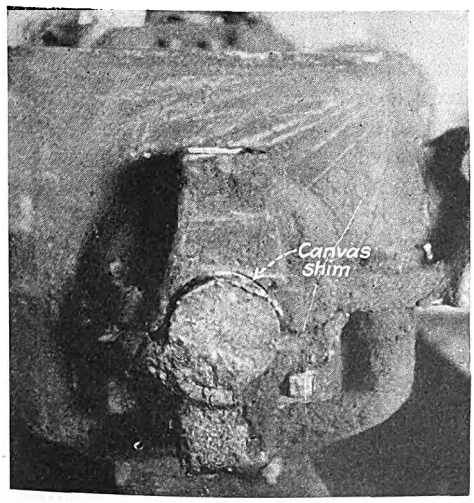
An armature coil cut out and returned to service may tie up operation and cause several hundred dollars worth of damage

Equipment men are beginning to understand that an excessive amount of oil is cheaper than excessive wear on bearings or their overheating. They probably do not understand that excessive wear happens mostly when they attempt to introduce economies by reducing the amount of oil used. If the general manager, or whoever is responsible for lubrication practice, would sit down with his pencil and paper for a few minutes and figure out just how much a slight increase in oil will cost, he would be surprised. Suppose oil is costing 32 cents a gallon. There are 32 gills to a gallon so the cost would be 1 cent per gill. Suppose also that twice as much oil is used so that instead of taking 1 gill for each lubrication, 2 gills are applied. With the usual method of adding a gill of oil to each bearing every thousand miles, the total amount used per year per bearing would be 1 gal. If this is doubled, the extra cost would be 32 cents per year per bearing. How much do bearings cost? $8 to $10. Which is better, to increase the life of the bearing or to pay a little less for lubrication?

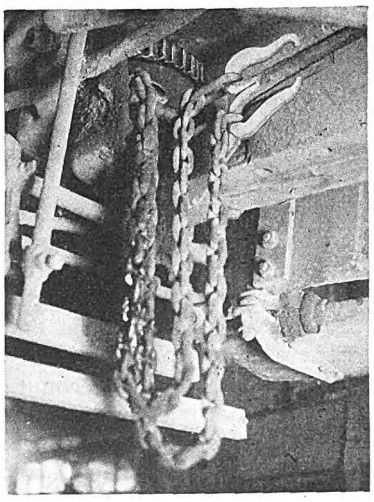
Suppose it were possible by some means yet unknown to supply a barrel of oil to each bearing in a year. The cost of a barrel of oil would be about the same as the cost of one bearing. If the life of the bearing is doubled, there is still a saving of half the price of the bearing.

Of course, the amount of oil used should not be excessive for too much oil may cause trouble as well as too little. General managers should do a little thinking along this line.

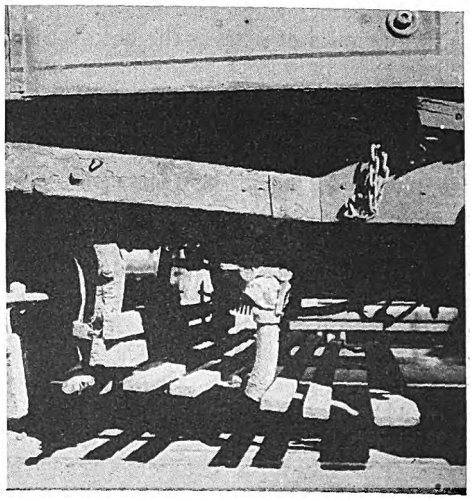
At the present time, there is a great deal of talk about reducing noise. Reduction of wear is the surest means of reducing noise, so that whenever a general manager talks of reducing noise he really means reducing the



A canvas shim around part of an armature bearing of an old motor has worked around to the top and closed part of the waste opening



Improper adjustment of brakes may allow chain to be taken up entirely before brakes are applied completely



A quick method of closing a hole in a sand spout. Stuffed with paper little sand will flow when needed to prevent a collision or avoid an accident

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amount of wear. The thing to do is to impress upon maintenance workers that the general managers are willing to spend a little money in reducing this wear and so they will not be afraid of reporting excessively worn conditions.

Money spent for such improvements will ultimately reduce maintenance cost, for high-grade maintenance is an economy. If there appears any doubt regarding this, study the records given out regularly in the statements of the Electric Railway Association of Equipment Men, Southern Properties. Pick out the systems that have the best pull-in records and see if their maintenance costs are excessive.

Usually, it is not fundamentally the fault of the superintendent of equipment or the master mechanic that the excessive wear takes place. These men try to conceal these conditions from the general manager. They know that asking for more money is out of the question so they try to do the best they can without saying anything. If they were made to feel that their general managers want to correct such bad practices they soon would make the effort, for all are vitally interested in keeping equipment up to the highest standard.

Few equipment men take the trouble to find out what

Worn-out hand tools may cause accidents to workmen and damage to expensive equipment

has happened to the oil after it has been in the housings for some time. The superintendent of equipment of a railway recently told of a number of tests on lubrication that had been made and said that as a result he was then using the best type of lubricant that he could get. This meant an increase in the cost of approximately 75 per cent over what he had used previously. He said that the tests showed that the better lubricant was more than worth its price in the length of life obtained, freedom from wear, and freedom from trouble. "That's all very good," I said, "when bearings are newly fitted and filled with new oil, but what is the nature of the lubricant after it has been in service two or three months?" "Suppose we find out," replied the superintendent. We went to a car that had been in service some three months, pulled the waste and took out some samples of the oil, which we placed in bottles and set aside. The next day we examined them. More than half of the contents of the bottles was a thick sediment or water. A large amount of foreign material had been introduced into the oil through improper handling, and through the entrance of dust and dirt, either through openings in the bearings or in the covers of the motors themselves. There is no use of paying a high price for lubricants if they are allowed to get dirty so soon.

Water is thrown up off the streets, and if the parts are loose or poorly fitted it enters the bearings. How many of our electric railway readers would operate an automobile if it had a hole in the side of the crank case? None, I venture to say. Then why operate cars in such a condition?

Careful Training of Workmen Insures High-Grade Door Maintenance

By George E. Oakley
Consolidated Car Heating Company, Albany, N. Y.

DEFECTS in door operating equipment cause delay, aggravate passengers and crews, and sometimes necessitate taking cars out of service. To minimize these troubles it is essential that the equipment be as simple and reliable as possible and that it be maintained properly. It is a very important part of the present-day car equipment, as quality of service depends to a larger extent on the operation of the doors than with previous designs of cars.

Reliability of the door equipment itself is affected to a large extent by its installation on the car. The apparatus must be located and arranged so as to allow it to function in the manner intended. There must be sufficient clearance provided for the doors, levers, and similar working parts, in order to eliminate binding, and the levers and connecting rods must be laid out so that they will work to the best advantage. Much faulty operation of doors and steps can be traced to a cramped arrangement of the mechanism. It is also important that the apparatus be installed so that it will be convenient for inspection and repair, as experience has shown that operators will slight equipment which is difficult to be reached or seen.

Another thing that is essential to prevent trouble and insure proper operation of the door equipment is education of the men whose duty it is to look after the apparatus. Such instruction should not be confined to the men actually doing the work on the equipment but the foreman in charge should also be instructed so that he fully understands the value of having parts inspected carefully. In fact, in order satisfactorily to maintain door operating equipment, it is essential that the foreman understand the construction and operation of the equipment so well that he knows how and why each component part of the apparatus functions. The foreman will then be in a position to instruct the men working on the equipment and will be able to judge from their reports of trouble found whether the actual causes have been located. If the workmen are none too familiar with the equipment and do not know where to look for the cause of the trouble reported, they are likely to grope around and do something that apparently improves the operation but does not remove the real cause. This results in the car being turned over as ready for service only to be soon again reported as defective.

The instruction of new men assigned to this equipment should be done by the foreman and not by the man who has been working on it or who has had some experience with it. This latter procedure will result in the new man getting only a smattering of knowledge of the equipment and he will not be qualified to do the work properly.

On account of the different types of equipment in service, no attempts will be made to give detailed suggestions of how inspection and overhauling should be done. Instruction books or rules for this procedure can be obtained from manufacturers. However, all concerned should understand thoroughly that co-operation with the manufacturer in this work of instructing the men is most essential.

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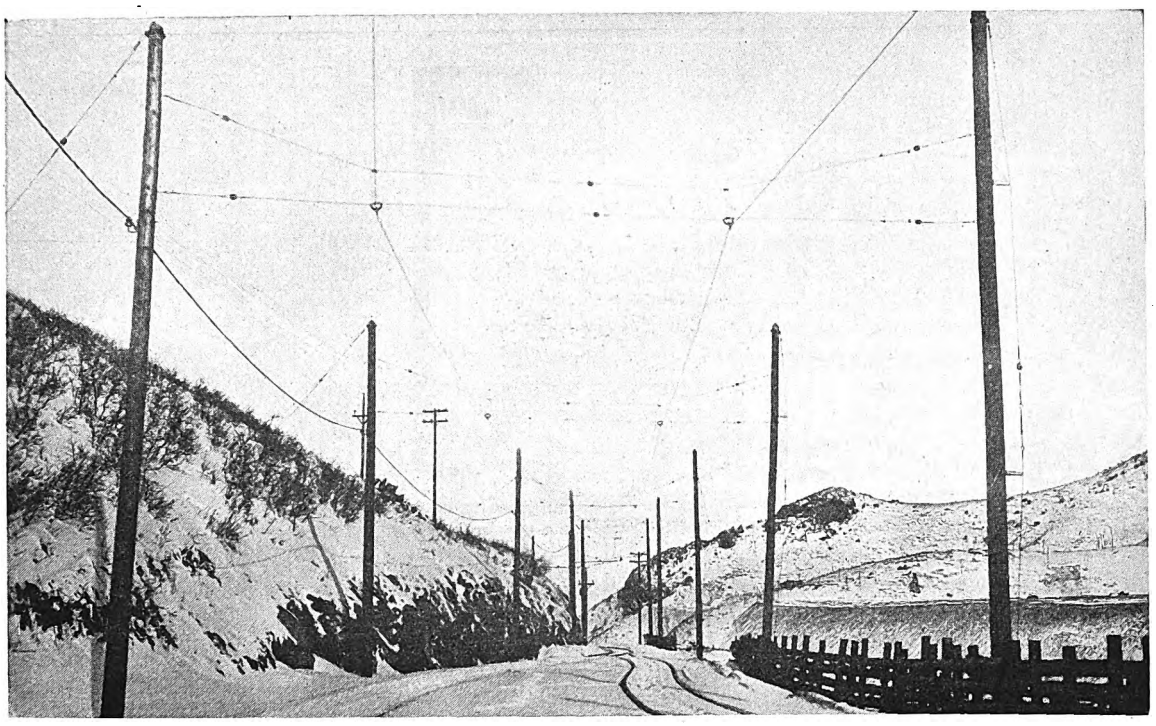

Proper insulation between trolley circuits reduces spanwire maintenance

Neglected Overhead

Is Poor Economy

Many railways have increased car speeds and weights and added power load without improvements in overhead. Small factors of safety are insufficient when deterioration occurs. A slack trolley wire is the lineman's enemy

By L. W. Birch

Assistant Manager Railway Sales Division Ohio Brass Company

OVERHEAD line engineers would consider the ideal trolley circuit to consist of a single, straight, unsupported wire paralleling the running rails at the desired height. But in practice there are curves, feeder taps, pull-overs, grades and special work. There are the ears and hangers at frequent intervals for support and insulation.

The direct suspension line almost universally adheres to a 100-ft. pole spacing for tangent track—a 100 ft. of unsupported trolley wire and a hammer blow, another 100 ft. and another hammer blow, and so on. This hammer blow is obtained at the support or attachment, whose function is to support and insulate the trolley wire. In performing these two functions the attachment must provide clearance for the trolley wheel or shoe, must have the maximum life commensurate with the materials employed and size of assembly, and must be as free from pounding as possible. We all know the effects of pounding at the cars—worn trolley wire, worn trolley wheels, dewirements, trolley base trouble, motor trouble and the uncomfortable vibration set up in the car roof. While this pounding is characteristic of all overhead, the degree of pounding is quite variable with different properties. Our problem then may be found on any property. It is to suggest a means of lessening the impact at the ear or support point.

Many properties have attempted to decrease the pounding by using a slack cross-span wire. This method is not always satisfactory, as a slack cross-span wire allows the dead weight of the hanger and ear to develop the maximum blow. With this arrangement the ear and hanger are moved upward through the pressure of the trolley wheel obtained from the springs in the trolley base. A hard blow is the result. Now consider a tight cross-span wire. In order to retain a tension of 1,000 to 1,800 lb. in the span wire (usual tension for tight

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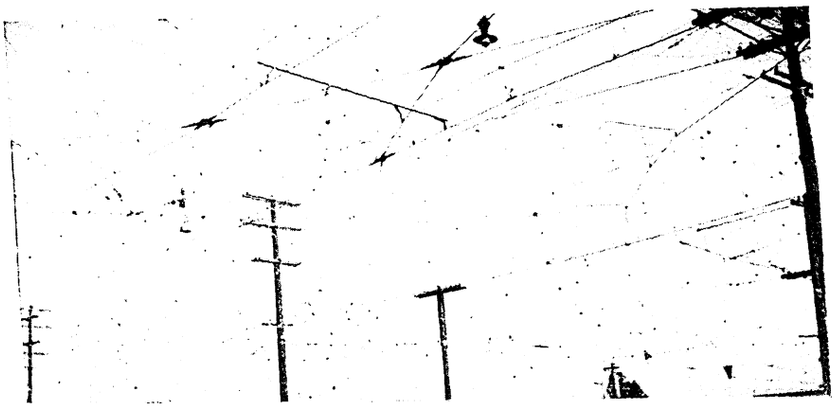
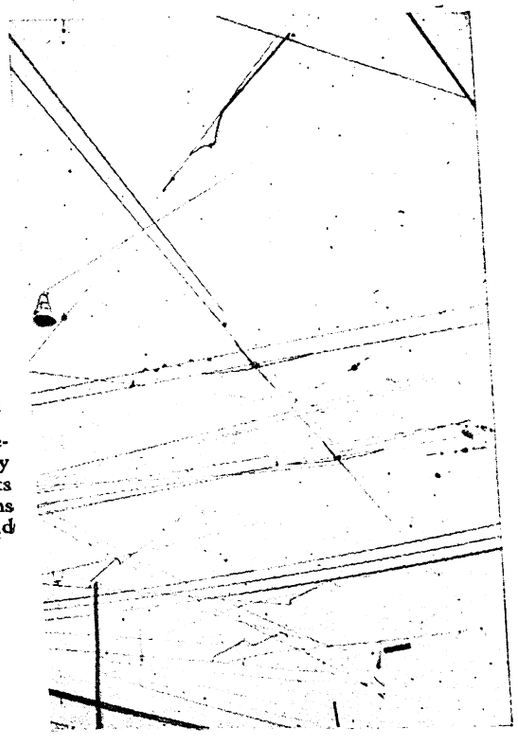




Supporting catenary in city streets presents many problems for the overhead man

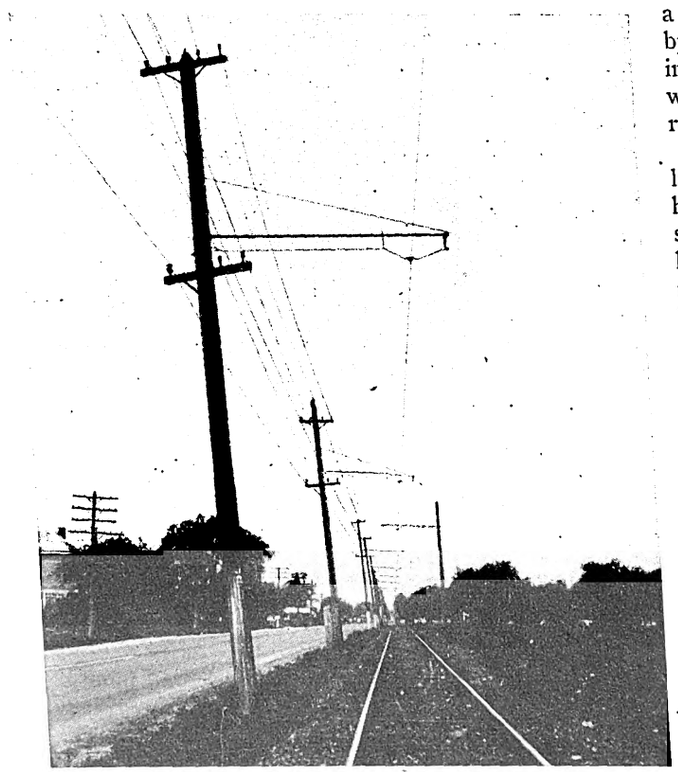
span wire), the poles must be set carefully and, in most cases, guyed. A mechanical tension of this value will tend to deflect the unguyed pole, and with the guyed pole the down guy will be taut. As a trolley wheel approaches an ear there is a tendency to unload the span wire. That is, the upward thrust of the trolley pole decreases the loading at the ear point with a consequent decrease in span-wire tension, which throws a lesser loading on the pole and it tends to straighten up. The pole deflection diminishes. The result is a slight rise in the span wire as the trolley wheel reaches the ear, hence a lessened blow.

Still further relief can be secured through the combination of ear and hanger. On round trolley wire the ear surrounds the wire. The greatest holding power of the ear is secured through the section under and adjacent to the boss. This is evident when it is remembered that the ends are tapered to provide a smooth under-run for the wheel. The long ear will afford this gripping power and easy approach. The short ear (5, 6, 7 and 9 in.) must have an equivalent supporting section which reduces the taper at the ends. Pounding results, and a short life of ear and wire may be expected.

Again, the tilting of the long ear will not aggravate the wheel blow in the same manner as with the short ear. The approach end of the long ear may lift the same distance as the short ear, but due to its length, it will not present such an abrupt angle for the wheel to strike. The hanger is also important. Recent experiments and installations have proved that by using a cushioned stud, a blow on the under side of the ear is partially absorbed by the cushion, or spring, back of the stud. This is important on bracket arm construction where the span wire is only about 9 ft. long and cannot offer further relief to the blow.

With catenary construction there is also a hanger problem which falls in the category of "hard spots and hammer blows." One reason for choosing catenary is its smooth under-run. The early lines were built with rigid hangers, which, although they provide a smooth under-run, permitted some pounding at the trolley wire clamps. This type was replaced by a loop hanger which permitted of an unhampered rise of hanger and trolley wire, irrespective of messenger wire, during a trolley wheel passage. This was a step in the right direction. But another factor contributing to "hard spots" appeared—hanger spacing. A recent inspection of a catenary system with hangers spaced at 50 ft. intervals showed that it was only a slight improvement over direct suspension. Fifty feet of trolley wire supported by short catenary clamps (2 in. long) fostered wire wear and mechanical difficulties in the overhead system. At least one additional hanger should be inserted between the present hangers. And if the railway wishes to maintain operation in the event of a trolley break, two additional hangers should be inserted. This will give 16⅔ ft. hanger spacing so that a broken trolley wire will not reach the ground and anneal.

A slack trolley wire is the lineman's enemy. It can cause more pounding at the ears than any other combination of conditions. The slack trolley wire usually is found over the track with light traffic as the result of



Many roads have outgrown the direct-suspension overhead by increasing speeds, and using heavier trains that require more current

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deferred maintenance. With a slack trolley wire the first trouble is pounding at the ears. As this increases, ears wear out and slip off and dewirements take place. Due to whipping between cross-spans excessive trolley wheel wear occurs, trolley base repairs start and motor troubles develop. Lastly, the wire wears thin at the ears, breaks, and then a new wire must be installed.

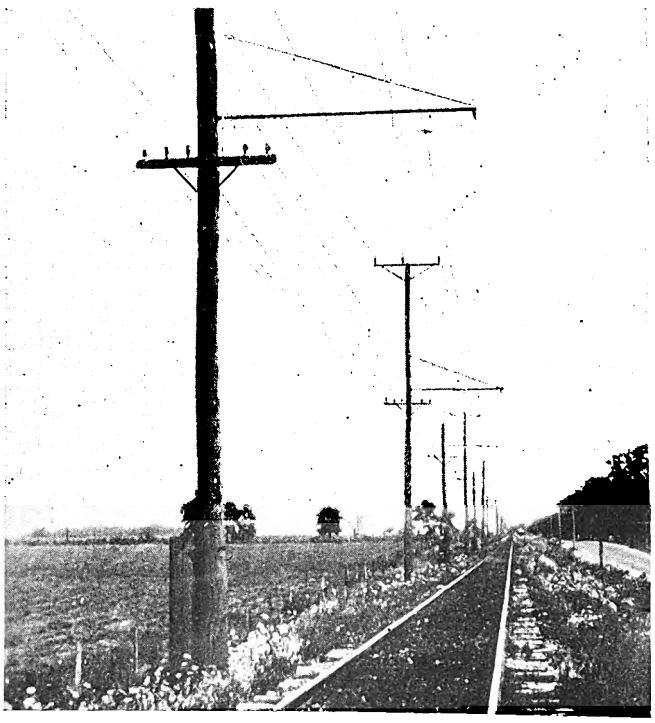
If there are only a few frogs or other special points in the overhead, the slack may be removed by cutting in a splicer, which should serve for a period of years. Due to infrequent service, which means long life for a trolley wire, the cross-span wires may get out of line, with respect to the poles, by cutting out slack. This defect is not serious. The span wires can be realigned during the next ear replacement. It is no exaggeration to say that a splicer used for slack removal may double the life of a trolley wire.

The choice of trolley wire size and kind must be considered by the user for his particular conditions at the time of purchase. For catenary work a grooved wire is preferable. The bump-bump-bump of a wheel over the small clamps or ears on a catenary hanger will not only produce arcing and burning of the wire but will drive the hangers in the direction of the car travel.

Rustproofing Pays

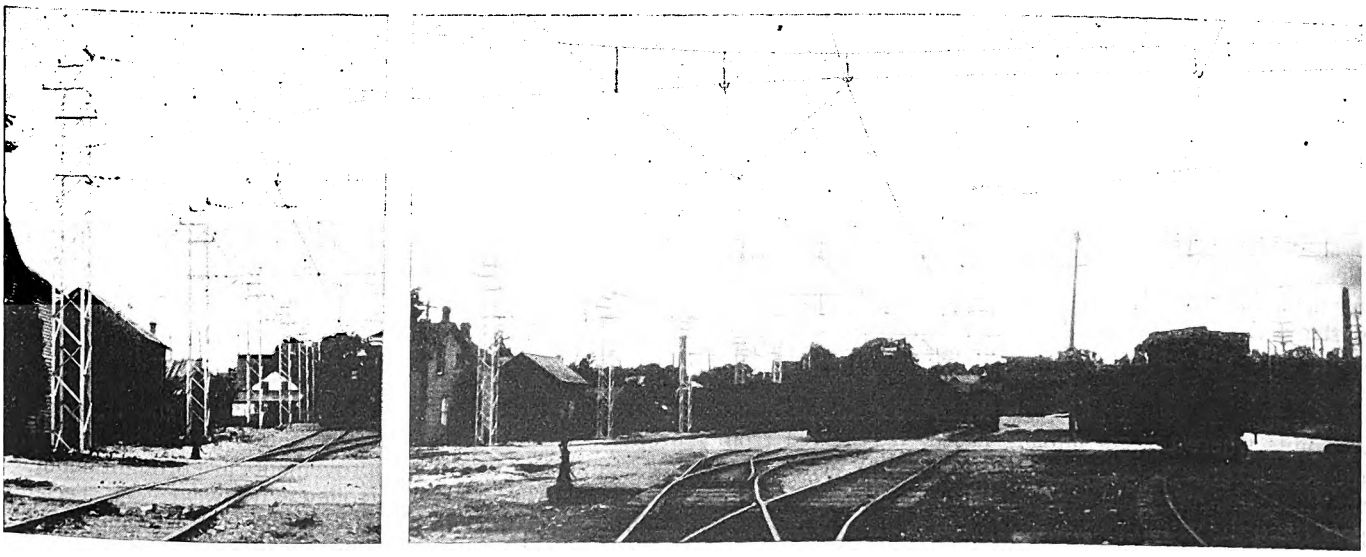
In many instances the blow of a trolley pole striking a bracket arm has crumbled the pipe and dropped the overhead. What did the inspection reveal? The pipe exhibited extreme corrosion. Many bracket arms manufactured with painted C tubing have been erected. The paint does not protect the pipe more than three or four years, when corrosion sets in. Along the open seam in the C tubing, moisture creeps into the interior of the pipe. Corrosion starts there. In a few years the pipe is dangerous. A 100 per cent galvanized job would have cost less than $1 more, and the pipe and fittings would have been protected for many years.

Another trouble develops from the rusty pipe bracket arm. Drip water from the rusty pipe and fittings falls on the insulated hanger and strain insulators in the span wire. Eventually an iron deposit is built up and leakage over the insulation starts. Drip water from rusty overhead also is a problem for the equipment man. Stained car windows, dingy bodies and coated roofs are an eyesore and a hazard. Good galvanizing is an asset to the equipment man.



With this construction, alternate poles carry the high-tension line, thereby eliminating half the high-tension equipment

In this article no attempt will be made to discuss the relative merits of the direct suspension system and the catenary system other than is necessary to emphasize fully the thought brought out in this discussion, that is, "Correcting Common Errors in Overhead Line Maintenance." A comparison in some detail was given in an article by the author in Electric Railway Journal for July 9, 1927, page 59. Each system has its place in the field. With this thought in mind, a logical question may be asked: Have the railways chosen their overhead systems wisely? There are many interurban roads that have built and maintained direct-suspension lines over private rights-of-way where tangent track predominates, where the curves are of low degree, where the time between terminals is being reduced constantly, and where heavy trains require considerable current. Possibly the overhead was erected at a time when catenary overhead was not good enough for consideration. But this does not alter the present-day condition. It usually is con-



Direct suspension in this storage yard made possible the use of self-supporting steel poles

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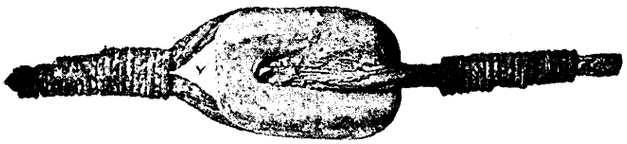
ceded that a catenary overhead system is selected primarily for speed, greater current carrying capacity and conductivity. Factors that may seem secondary, but that are vital, are low maintenance, less abuse to collecting equipment, greater vision, less insulated suspension points and appeal to the public eye.

Span Wires and Span Insulation

There is a tendency on many properties to use single-strand (usually No. 8) galvanized iron wire for pull-overs. True, this wire is of sufficient strength to withstand, with a small factor of safety, the mechanical tension usually imposed on it. But what of corrosion? And what of the shock received by a span wire or pull-over wire due to the hammer blow of a trolley pole following dewirement? A single-strand galvanized iron wire will not withstand these blows for long, and it will not resist corrosion over a period equivalent to the life of the pullovers. Again there is a needless expenditure.



This sample of corrosion was taken from a span in service twelve months along the sea coast

A piece of $\frac{1}{4}$ in. or $\frac{5}{16}$ in. regular grade messenger wire, with core wire protected from corrosion, will withstand the ordinary blows of a trolley pole for many years. Flexibility is obtained, guarding against fatigue of the strand, and it is easily handled by the line crew. The cost is little more than for the single strand.

In many localities steel strand is not used with success. An excellent example is shown in an accompanying illustration. This insulator and $\frac{1}{2}$-in. galvanized steel strand had been in service exactly twelve months when it was necessary to renew the entire span wire and many others in the immediate vicinity. This wire was taken from a section of overhead paralleling the sea coast but is characteristic of many other localities. After replacing steel strand for many years at the rate of one new set of span wires yearly, this company finally resorted to a bronze span wire which is giving excellent results, and reducing the maintenance on the coast section to a figure which is justifiable. A bronze messenger wire also is to be recommended for coast service.

In many instances span wires over multiple tracks fail to carry insulation between the trolley wires. Usually an insulated hanger is used. However, on many pass tracks and yards an uninsulated hanger is used with insulation at the pole only and none between trolley wires. Insulation in the span wire between trolley wires is necessary to protect the span wire. With no insulation a current will flow between trolley wires through the span wires. This current flow sometimes sets up an electrolytic action and in other cases (due to the presence of acid from smoke) a galvanic or cell action which destroys the strand. A small amount of insulation in the span wire will break up this current flow and protect the span wire.

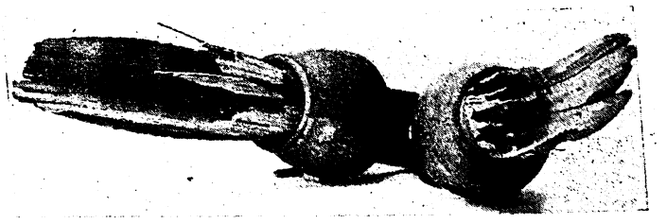
Most of the cell action referred to above occurs first at points where the galvanizing has been removed from the strand through flaking or through injury at the time the lineman served the joint make-up. The iron is exposed and the action starts.

There have been three accepted forms of span wire insulation—wood, composition and porcelain. While all have proved quite satisfactory under normal city operating conditions, wood and composition have their limitations. On coastwise work, wood and composition are not very satisfactory. The example illustrated herewith where steel strand was replaced with bronze was striking in this respect. Previous to the adoption of porcelain, composition insulators were used between trolley wires and wood strains at the poles. The salt deposit in wet weather permitted considerable leakage with the consequent carbonization of wood and composition. A breakdown was the result. Porcelain insulation collects a salt deposit and in time will permit leakage, but it takes the most severe current flow to heat it and break it down.

The majority of interurban lines carry a high-tension feeder circuit on top of the pole that supports the overhead. This line may be any voltage from 6,600 to 44,000 alternating current. The wire size runs from a No. 2 up and most of these circuits are three-phase. For a 33-kv. line with a 100-ft. pole spacing the insulation, crossarms, hardware, and labor for installing will cost in the vicinity of $700 for a mile. If this spacing should be increased to 200 ft. the cost would be halved and, alternate poles could be 30 or 35 ft. in height instead of 40 or 45 ft. Maintenance would be lowered and the leakage and the hazard would be decreased, and where the line warrants catenary, the low poles could be entirely eliminated at a later date. There are many examples of 100-ft. pole spacing on high-tension lines being changed to 200-ft. pole spacing today.

Association Committee Assists in Improvement of Practices

Co-operation of overhead line engineers and manufacturers of trolley line materials through the power distribution committee of the American Electric Railway Engineering Association has improved the standards of maintenance. One purpose of this committee is to formulate standards for overhead materials, equipment and wire. Another purpose is to provide a medium for exchanging ideas of those engaged in similar lines of work. The standards created by these committees aid the manufacturer in a house cleaning which results in more attention being placed on a better line of products. However, a good line of products may be rendered partially useless through misjudgment and misunderstandings of the user. Here is where the exchange of ideas is priceless. One member calls another aside and explains how he is having trouble with dewirements on a certain type of frog. It develops that he has located the frog improperly with respect to the switch point. This is just one example of the way improvements are brought about. Another is the study of trolley wire wear. A special committee is conducting a survey that is developing much information about overhead and its care.



There are many worm-eaten wood strain insulators in the warmer sections of the country. They may be eliminated by using creosoted wood

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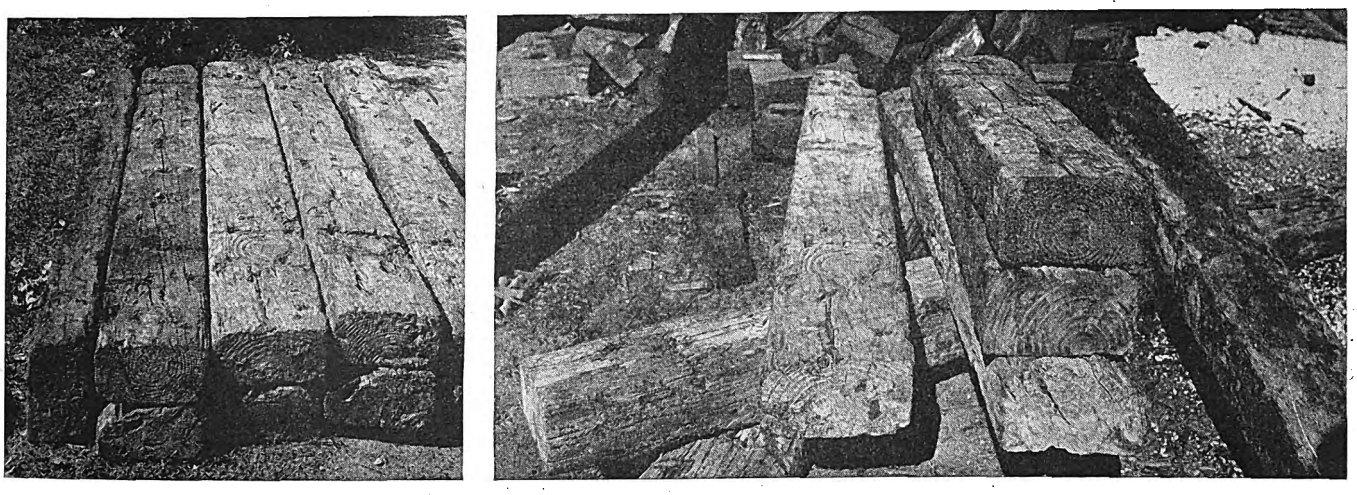
Impregnation Pays

With Wood Tie Construction



Ties removed from tracks of the Georgia Power Company in 1926. A large majority were found to be in good condition after 31 years of service

Georgia Power Company treats wood ties so they will last 25 years against decay and protects them against mechanical wear with steel tie plates. Maintenance cost for 1926 was but $677.50 per mile of track

By C. A. Smith

Superintendent of Roadway Georgia Power Company, Atlanta, Ga.

FOUR primary conditions govern the cost of track maintenance: first, the design of the work; second, the materials used; third, the workmanship and care used in its construction; and fourth, the service to which it is subjected.

In considering the effect which the use of timber ties has on maintenance cost, I will assume that the design of the track is good, that proper section of rail is used together with correct specifications as to manufacture of special work, that the joints have been made as nearly perfect as is possible by welding or otherwise and that they are ground to perfect surface and that the workmanship is first class in all respects.

If the track is laid in a paved city street with pavement constructed so that the water does not reach the subgrade or the subgrade is drained so that it will not yield, then there should be very little maintenance cost during the life of the rail, which should be from fifteen to twenty years, depending on the volume of traffic. This is, of course, predicated on the ties remaining in good condition along with the balance of the track material. In years past much of the track maintenance was caused by the necessity of renewing ties either on account of decay or the gaining of the base of the rail into the tie, where the tie was protected by preservatives against decay but was not protected against mechanical wear of the rail.

We have removed creosoted ties which have been in service for more than 30 years and which were in a good state of preservation chemically, but which were in bad condition mechanically due to gaining of the base of the rail. Our present practice is to preserve our timber ties against decay so that they will have a life of approximately 25 years and further to protect them by use of a steel tie plate against mechanical wear of the rail. This we figure requires a plate of approximately 72-sq.in. area.

On the system of the Georgia Power Company we have 247.73 miles of track, practically every foot of which is now built with creosoted timber or steel ties, there being only a few miles of the latter which were installed the past few years. Unquestionably, for wood construction impregnation pays. We estimate a saving in track maintenance of $1,188 per mile of track per annum over untreated ties where track is laid in a street with paving valued at $3.50 per square yard. With paving at a higher value the saving would be greater on account of the additional cost of tie replacement. Our

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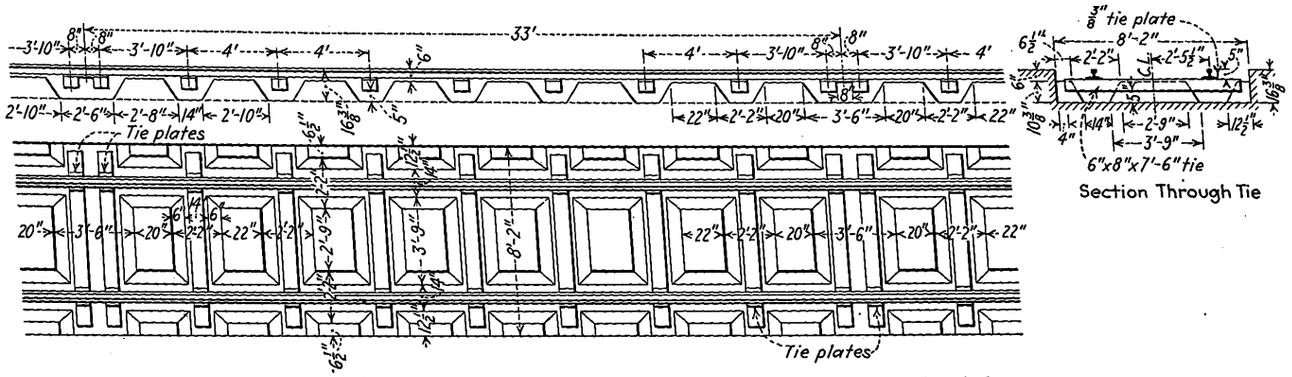


Standard concrete beam construction with wood ties used in Atlanta

This is designed for 6-in. pavement and 80-lb. A.S.C.E. rail. The joints are thermit welded. Two 8x9x⅜-in. flat tie plates are placed on each tie. The rails are held with A.E.R.E.A. standard ⅝x5½-in. spikes. The ties, 6x8 in. by 7 ft. 6 in. long, are treated with 6 lb. of creosote per cubic foot.

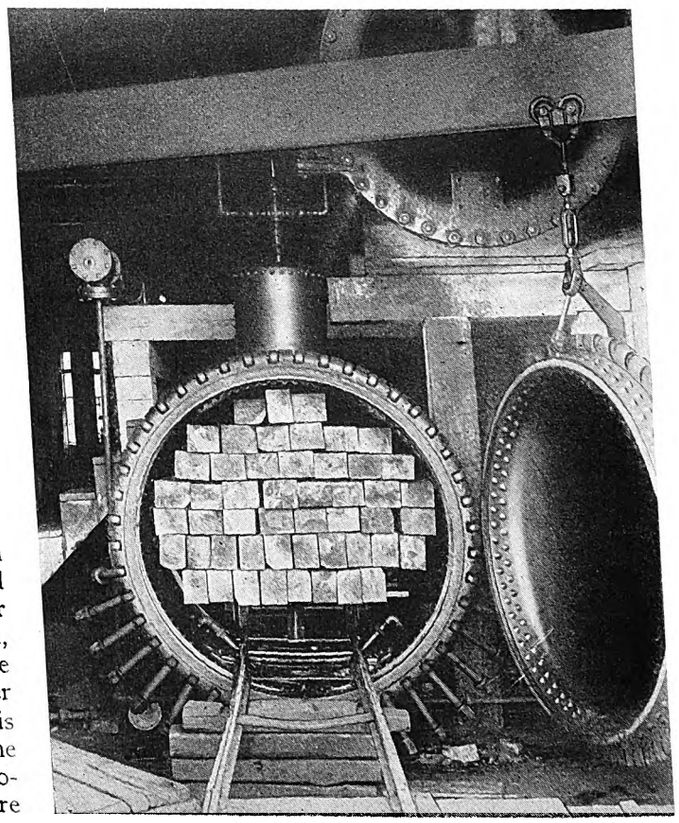
The concrete below subgrade for a 6-in. pavement is 0.143 cu.yd. per foot of track, and for a 7-in. pavement is 0.131 cu.yd. per foot of track. The volume of two 5x9x15½-in. blocks beneath each tie was deducted from the concrete in figuring the above volume. Similar installations are made with Dayton ties.

maintenance cost per mile of track in 1926 was $677.50, which is one of the lowest in the country, some systems costing as high as $2,000 per mile.

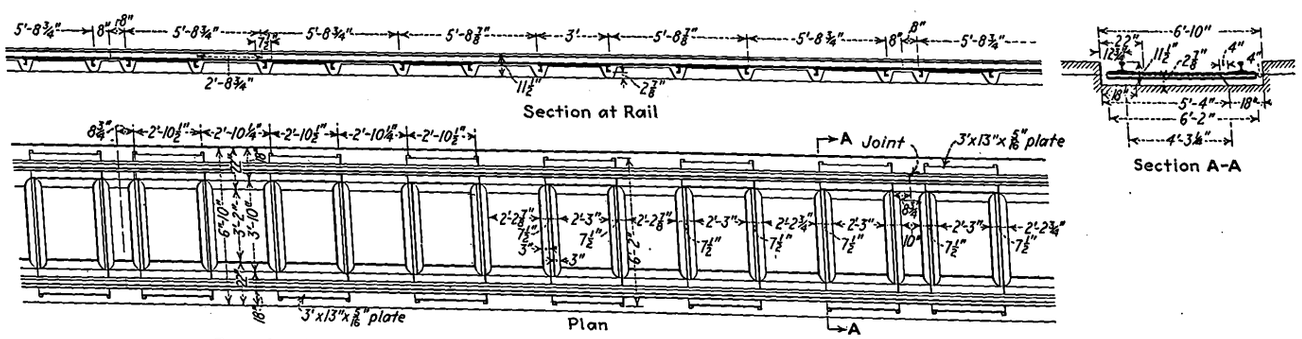
Special care in track reconstruction and improved maintenance practices on the lines of the Georgia Power Company have resulted in lower costs and less troubles. A reduction in total derailments and split switches from 270 in 1923 to 129 in 1926 is one of the evidences of increased reliability of service.

A process of laying track and paving foundation under traffic has enabled the completion of such work in 24 hours time or less. This process is to double tamp thoroughly clean crushed stone 5 in. beneath the tie, after which new crushed stone is added to bring the foundation to the required height for the paving base and thoroughly rammed. The stone is then filled to its surface with 1 to 1½ grout to which 3 lb. of calcium chloride per sack of cement is added. The paving surface is immediately laid and traffic turned on it as soon as ready.

The relative advantages of timber as compared with steel ties depend somewhat on local conditions and local prices. With prices prevailing in Atlanta and with our standard beam construction using 80-lb. A.S.C.E. rail, concrete pavement and concrete foundations for the track, the cost is about equal with concrete at $10 per cubic yard. With higher concrete cost the steel tie is more economical and with the concrete costing less the creosoted timber tie with steel tie plates is more economical. Our designs for these types of tracks are shown in the accompanying drawings. We also have similar installations with Dayton ties.



The tie treating tank at the Atlanta creosoting plant with a load of ties in position for treatment



Standard concrete beam construction with International Steel Ties used in Atlanta

This is designed for 6-in. pavement and 80-lb. A.S.C.E. rail. Joints thermit welded. The concrete below the subgrade for a 6-in. pavement is 0.060 cu.yd. per foot of track, and for a 7-in. pavement is 0.049 cu.yd. per foot of track. The volume of ten 6x8x15-in. blocks beneath each 33 ft. was deducted from the concrete in figuring the above volume.

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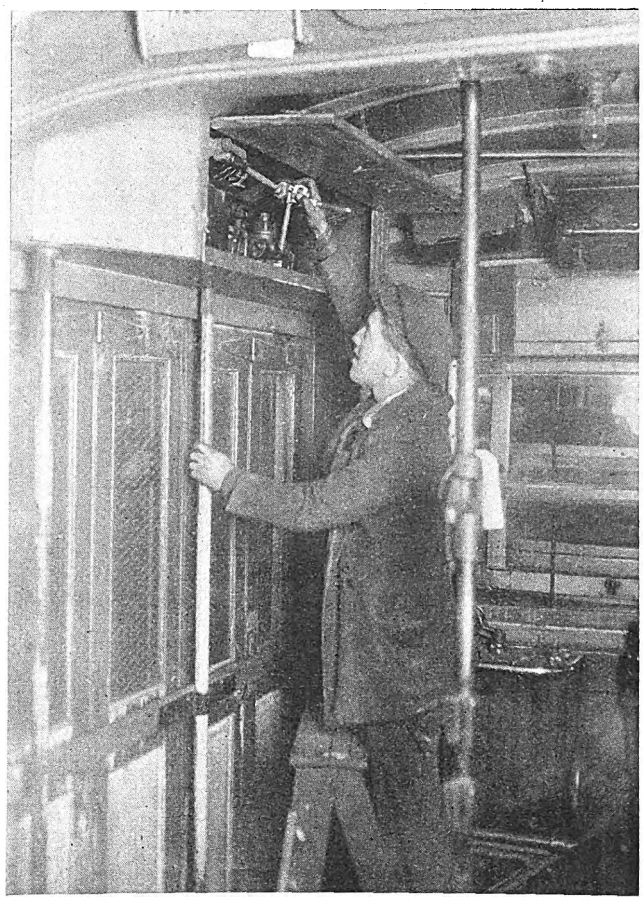
Speedy Service Requires

Efficient Door Mechanism

By Ray S. Frehse
Sales Engineer National Pneumatic Company, Chicago, Ill.



Door engine being removed from the car, dismantled and overhauled on the bench

SUCCESS of the modern street car is dependent in no small measure on the pneumatic door control. This part of the car equipment affects the passenger first when he enters and last when he leaves. When the mechanism is functioning perfectly the car can be expected to give the service for which it was designed. If it is not functioning exactly as it should, the schedule speed is likely to be slowed down and the passengers will obtain a bad impression of the company. However, the door control equipment is one of the easiest parts to maintain in first-class operating condition.

Continued perfect operation of door equipment requires principally careful, periodic inspection. The primary requisite is to prepare a specific schedule of the procedure in inspection so that each part will be tested in turn and none will be overlooked. The inspector should try out all of the mechanism from each of the operating positions in the car as a matter of routine. Once he has learned this procedure by heart so that it becomes a habit, he will be able to check each part very quickly. Unless a definite routine is established, something is sure to be missed which later may develop a failure in service. Like all other car equipment, in addition to the periodical inspection a thorough general overhauling should be made every two or three years.

Most of the trouble with door mechanisms comes from abuse or accidents. If the parts are adjusted properly at the regular inspection, which usually comes every ten days or two weeks, any failure to operate as they should is due to something which has happened to the doors or steps and their connections since the last inspection. The procedure then is to look for those points which are most subject to damage from the outside.

Probably the easiest way to outline what should be looked for is to give the procedure which may well be adopted at the periodical inspections. First of all, each door should be opened and closed to make sure that the mechanism moves the door to its proper position and that the steps fold up and open out as they should. The time it takes the doors to travel the full distance should be noted, as this is one of the vital features that makes for high schedule speed. In general, doors are adjusted to open a little faster than they close, but they should not slam in either direction. If these requirements are not met, trouble should be looked for at once. Sometimes the step connecting rods are bent because the car has run over an obstruction which has hit them. At other times connecting rods and shafts are sprung because the trainmen have forced the steps open with switch hooks. The jam nuts should be inspected carefully for tightness, and cotter pins and pivot pins should be in good condition and in their proper places. Inspectors sometimes fail to tighten the jam nuts or leave out pins. Then the levers may slip or the rods work loose so that the mechanism is thrown out of adjustment. Failure to observe these simple rules has been responsible for poor action of doors, so that it is essential to check up at each inspection.

Leaks in piping, gaskets and valves seldom occur and when found they are corrected easily. When they exist, the doors cannot, of course, open or close at the rate for which they were originally set. It is therefore important that the inspector be on the lookout for leaks and see that none remain when the car is released after inspection.

Apart from these points, accessory equipment such as door switches, signal lights, control valves or switches, quick release valves, treadle devices and brake interlocks should be tried out by the inspector and each function observed when they are controlled from every point in the car.

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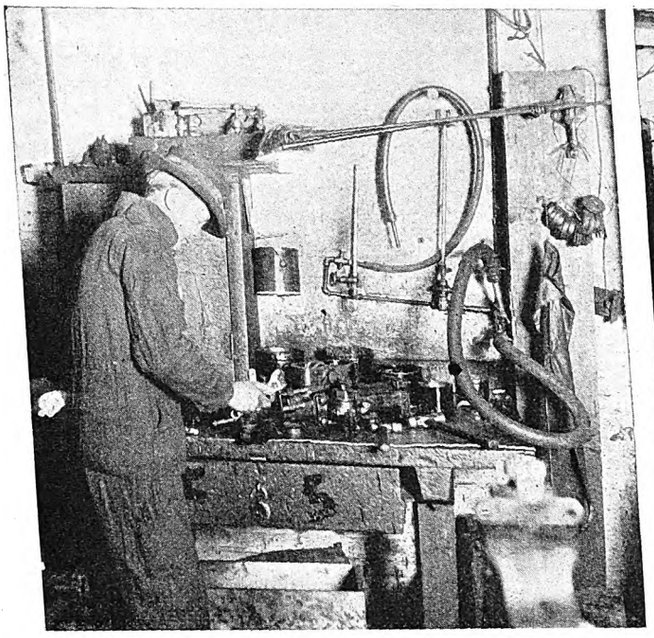
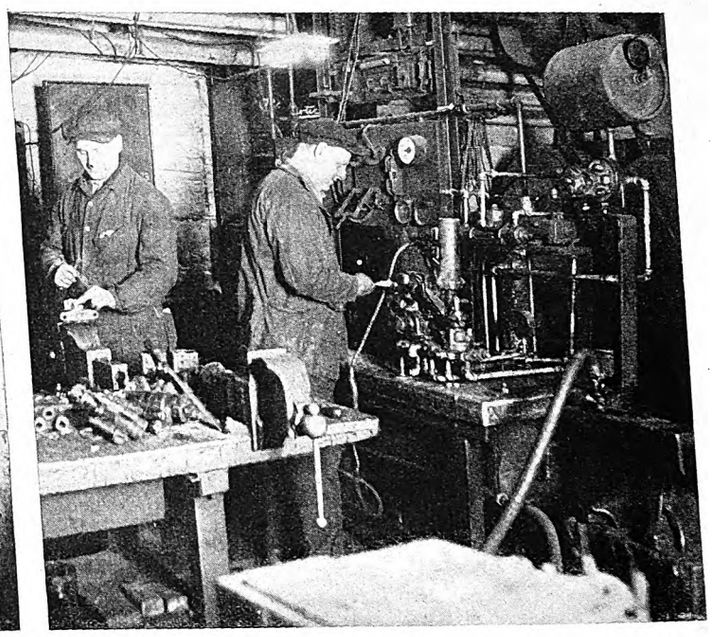
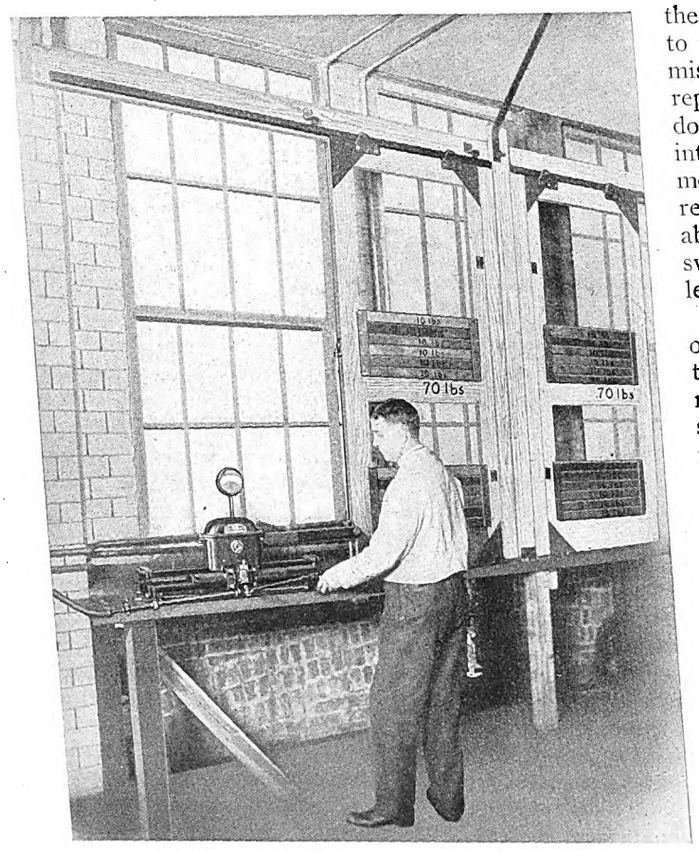


Care in reassembling of overhauled door engines will save time later in making adjustments



Testing the door engine with air pressure to make certain there are no leaks, on the Third Avenue Railway, New York

One of the most common sources of trouble with door mechanisms is oil on the pin connection and grease on the door tracks. In the ordinary control these parts are casehardened to resist wear. Oil is unnecessary and when it is put on it soon collects dirt and grit so that a grinding compound is formed that wears the joints and shortens the life of the parts. When grease is put on the overhead track it not only results in additional wear on the guides, but is apt to drop on passengers.



Final testing of the engine for incorrect operation may save a delay in service. The test bench should be arranged for quick installation and removal

Occasional General Overhauling Advisable

If the periodical inspection is properly done there is little likelihood of failures in service, and the wear on parts will be small. General overhauling, however, is desirable at intervals of one to three years, according to the severity of the service. This gives the opportunity to inspect all parts after they have been dismantled. A mistaken practice sometimes observed is to attempt to do repair work on the car. Naturally it is not possible to do a thorough piece of work and the car will go back into service with the equipment in poor condition. Every moving part should be taken from the car and cleaned, repaired and inspected at the bench under the most favorable conditions. Door engines, control valves, all switches and other pneumatic apparatus, connecting rods, levers and treadles should be handled in this manner.

Difficulties that are encountered in operation after overhaul usually come because proper care was not taken to see that worn parts were either renewed or refinished to eliminate the bad effects of wear. Valves should be taken apart in the air room, cleaned and inspected carefully. Slide and rotary valves wear on their surfaces so that they should be checked with a surface plate and reground, if necessary. Pin valves usually require renewal and their seats should be trued with a tool. For this performance it is essential that after the magnet valves are reassembled, the air gap and travel should be checked with gages that are supplied by the manufacturer. The magnets should be checked electrically to insure that they will operate at the minimum voltage. Balls in ball check valves should be renewed. They cost only a trifle and the installation of new ones will save much trouble, even though the old ones are worn but little. The ball seats should be trued up with a tool.

Grease and dirt in door engines are sometimes sources of trouble. The engines and their passages should be carefully cleaned and blown out with air. Piston packing cups are likely to harden and leak. It is better to renew

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these packing cups after the second year than attempt to keep them in service, as this is a small expense compared with the failure of a door engine. Ordinarily, a set of packing cups will go from one overhauling to the next one, or a period of two years. Gaskets, likewise, should be inspected and renewed if they appear lifeless.

Renewal of worn pins and bushings is another preventive of trouble later one. Connecting rods often have the threads damaged so that while they are off the car during the general overhaul, it is easy to hand-chase the threads to save time in reassembling.

When the equipment is reassembled on the cars after overhauling, it is quite necessary to check all moving parts for time of operation and adjust them to give the proper speeds. All pneumatic parts should be tested for leakage to be sure that they have been properly seated and tightened. If these precautions have been followed out, the door mechanisms should go back in service after overhaul in practically the same condition they were in when they were new and should function without necessity of more than the regular periodical inspection until the time of the next overhaul.

Automatic Power Supply for Cincinnati Railway

ELECTRICAL apparatus, which will be in operation this year, with a total rating of nearly 30,000 kw. is included in an automatic substation system planned by the Cincinnati Street Railway. It will distribute power to the trolleys by means of nineteen automatic substations, without attendants. The system was designed by the General Electric Company for supplying power automatically.

The new power and distribution arrangement comprises an area having a maximum radius of 8½ miles from the city's business center, in which the automatic substations are located. Power will be supplied by the Union Gas & Electric Company. Substation locations have been selected carefully, with a view of serving the present lines, and providing for anticipated growth of the city and its railway system.

Each station is automatic in all respects. Doors are locked from the outside. Whenever a demand for power arises at any point the station serving the proper area will commence operation and continue to deliver power so long as the load demand exists, after which it will shut down and wait until it is again called upon to function. Should any one of the feeder circuits develop faults during operation, that feeder will be cleared automatically, and after the fault has been removed it will reclose automatically. The station will also protect itself automatically against other irregularities. By this arrangement each station becomes a responsible and dependable element in the system, delivering power whenever required to do so, and checking up automatically for any unusual conditions against which it must protect itself.

Superimposed over the automatic operation of the nineteen stations will be a central dispatcher who will be informed at all times, by means of an automatic indicating system, whether a station is operating, what units in any particular station are running, and what the feeder load and other readings are at any given time. The dispatcher may, if necessary, interrupt the automatic control and govern operation himself, as in the event of a fire or other similar emergency.

The plan calls for the abandonment of one substation, the remodeling of nine, and the construction of ten new ones. Each substation will contain one or two synchronous converters receiving 13,200-volt, 60-cycle alternating current from the public utility, and delivering 600-volt direct current to the railway. Three of the downtown stations will contain two 1,500-kw. converters each. Ten stations will each contain one 1,500-kw. converter, five will each contain one 1,000-kw. converter, and one station a 200-kw. converter.

The substation buildings have been designed to insure continuity of operation in the hottest weather, provision being made to conduct to the outside the heated air discharged from each electric machine. Transformers will be set on gratings through which cool air comes in at the transformer base and flows upward through the radiator pipes and out through ventilating ducts. The appearance of the buildings will be attractive both inside and out.

Each station will function in an automatic sequence as follows: While the converter is idle, a voltage relay is continuously measuring voltage on the direct-current bus, which is always energized through feeder ties from some adjoining station. If the measured voltage drops to a predetermined point, signifying a coming demand for power, the voltage relay passes on an indication to start operation. Immediately a motor-operated drum controller rotates, contact fingers energize control circuits, and the following operations take place: (1) the oil circuit breaker closes, energizing the main power transformer; (2) the starting contactor connects half normal voltage to the converter collector rings for starting; (3) the converter is polarized; (4) the running contactor connects full voltage to the converter when it has reached synchronous running speed, and (5) the converter is connected to the direct-current bus to deliver power. Meanwhile various relays have been checking to make sure the circumstances are correct for running the station, and the converter is not finally connected to the direct-current bus until this check has been satisfactorily made.

Should overload or any unusual circumstances arise during operation, the equipment can limit load or do whatever is necessary to permit continuing operation. Should conditions be sufficiently severe, however, the station will shut down. After the trouble has passed the converter will restart, but if the trouble warrants an inspection before restarting, the station will not restart and the central dispatcher will be notified.

The supervisory control, exercised by one man in an isolated room in one of the substations, is the most extensive ever undertaken. In the supervisor's office there will be a semi-circular switchboard including ten panels, each of which will carry the control circuits and indications for one of the substations. By means of control buttons the supervisor may, if necessary, perform any one or more of six governing operations, and, by means of colored lights, he will have an indication of all important operating conditions at each substation and can see that his commands are carried out.

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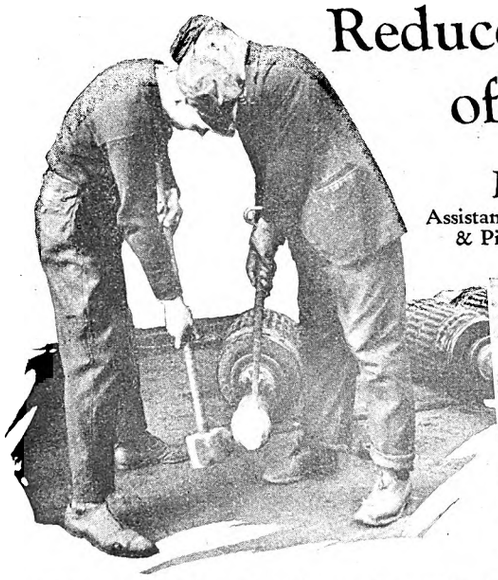
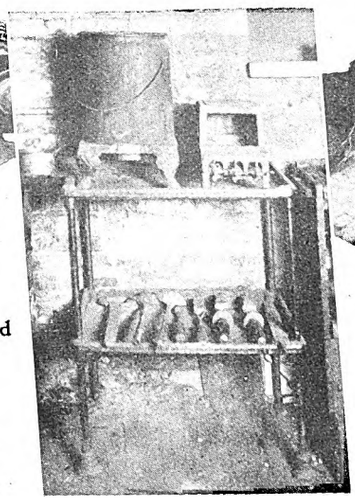
Attention to Gearing

Reduces Maintenance of Entire Car

By E. S. Sawtelle
Assistant General Manager Tool Steel Gear & Pinion Company, Cincinnati, Ohio



Sledging on of pinions should never be permitted



Simple arrangement by which pinions on small properties can be heated readily in boiling water and thus provide a uniform shrink fit

After removing the pinion from the heating tank it is shoved on the shaft with a few light taps

BETTER maintenance of railway gears and pinions will give greater gear life, less noise and less trouble from bearings and associated parts. One of the most common abuses of gearing is the old-fashioned practice of installing pinions with the aid of the sledge. With high-grade hardened pinions brutal sledging is apt to start trouble which some day may develop into a broken tooth or a burst pinion. Many pinion failures on railway motors are caused by incorrect installation.

A rather general belief is that if a pinion is shoved on the shaft and the nuts are tightened, it will remain tight and run satisfactorily. Experience has shown that in order to give satisfaction a pinion should be driven by its shaft through the press fit or shrink fit. The key acts merely as a safety device should the pinion loosen accidentally.

The hot water method of installing pinions has proved most satisfactory. By heating the pinion in boiling water and tapping it neatly onto the shaft, there will be a uniform shrink fit that will hold it against shifting or loosening. At the same time it will not be subjected to undue strains which are apt to lead to failures. I know of many properties on which the loose pinion problem has been solved completely by hot water applications of pinions. By the same method pinion breakages have been cut down.

The following points should be observed when putting pinions on railway motor shafts with taper fits. First, the shaft should be cleaned and free from burrs or swellings. Second, the pinion bore should be clean and free from burrs, and third, the fit of the pinion should be in contact with at least three-quarters of the surface of the taper fit on the shaft. This can be checked by rubbing Prussian blue, thin red lead and oil, or thin lamp black and oil on the pinion bore and fitting it on the shaft.

Before the pinion is pushed into position a check should be made to see that its keyway is of proper size for the key mounted on the shaft and also that the pinion does not ride or bind on the top and sides of the key, and will not ride the key when pressed on further. The keyway on the pinion can be 0.002 in. larger but not smaller than the key. There should be at least $\frac{1}{64}$-in. clearance between the top of the key and the bottom of the keyway in the pinion. The corners of the key should not cut into the fillet of the keyway. To prevent this the corners of the key should be rounded.

On some railways pinions are pressed on cold in a vertical press or a wheel press. While this may be considered an improvement over sledging, still the best method for all conditions is that of heating the pinion in boiling water. Pinions up to 3-in. bore should be heated for approximately 30 minutes, and those of 3 in. or larger bore for about one hour. When the pinion has attained the temperature of the boiling water, 212 deg. F., it should be taken out and the bore wiped clean quickly. Without allowing the pinion time to cool, it should be pressed onto the shaft. It should be understood that the pinion is not to go on with a driving fit but only with sufficient pressure to insure a proper fit. After the pinion is in position it should be given three or four light taps, using a heavy piece of wood or copper between the pinion and the hammer, distributed evenly around the circumference. This should be enough to make certain that it is well seated.

Special pinion heating tanks are used on many railways, in which the water is heated either with electric heating units, gas or steam. Where such equipment has not been purchased a substitute can be provided easily by use of a small tank or receptacle in which water can be boiled and into which the pinions can be placed for

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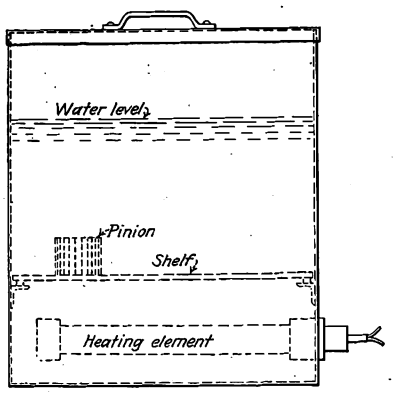
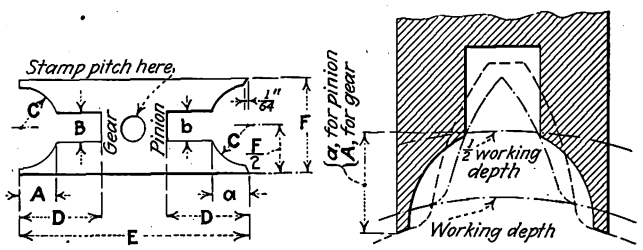


Electrically heated pinion tanks present a neat appearance and boil water quickly for heating pinions

heating. The addition of washing soda to the water in the proportion of ¼ lb. of soda to 5 gal. of water will prevent rusting of the pinions and insure a clean surface at the fit. With this method, it is possible to put pinions on armature shafts so they will stay put and drive through their fit under the very hardest pulling of the motor. Pinions may be damaged in removing by improper methods quite as easily as in their installation. Use of a wedge and a sledge hammer to remove pinions is to be condemned. Many efficient types of pinion pullers are on the market which will not only give increased life to the pinion but also make removal easier. With most of these one man can do the work.

"She is not nearly worn out, leave her for another overhaul." This expression, sometimes heard among maintenance forces, is due to a false idea of economy. When gears are so worn that their teeth lose all semblance to the involute shape it is time to discard them. They are apt to cause undue strain on the bearings and a pinion or gear that wears out in service and necessitates a special shopping of the car will eat up all the savings that might be realized from a dozen other gears that barely manage to survive until the next overhauling period.

In 1926, the American Electric Railway Engineering Association adopted condemning gages to show when gearing should be discarded for wear. In the work of the equipment committee for several years previous replies to questionnaires on gearing showed great variations in life, much of which apparently was due to the removal or scrapping of gearing without working to a definite standard. The committee determined upon a



Discard Gages for Spur and Helical Gearing

Dimensions in inches of discard gage for spur gears—long and short addendum

Pitch	A	a	B	b	C	D	E	F
4½	0.281	0.321	0.247	0.247	5/16	3/4	2½	3/4
4	0.299	0.339	0.262	0.262	11/32	3/4	2½	13/16
3½	0.341	0.379	0.299	0.299	3/8	7/8	2½	7/8
3	0.398	0.448	0.348	0.348	13/32	1	2¾	1 1/16
2½	0.476	0.508	0.418	0.418	1/2	1¼	3	1 1/8
2½	0.529	0.564	0.465	0.465	9/16	1¼	3½	1¼
2	0.594	0.631	0.523	0.523	5/8	1⅜	3½	1⅜

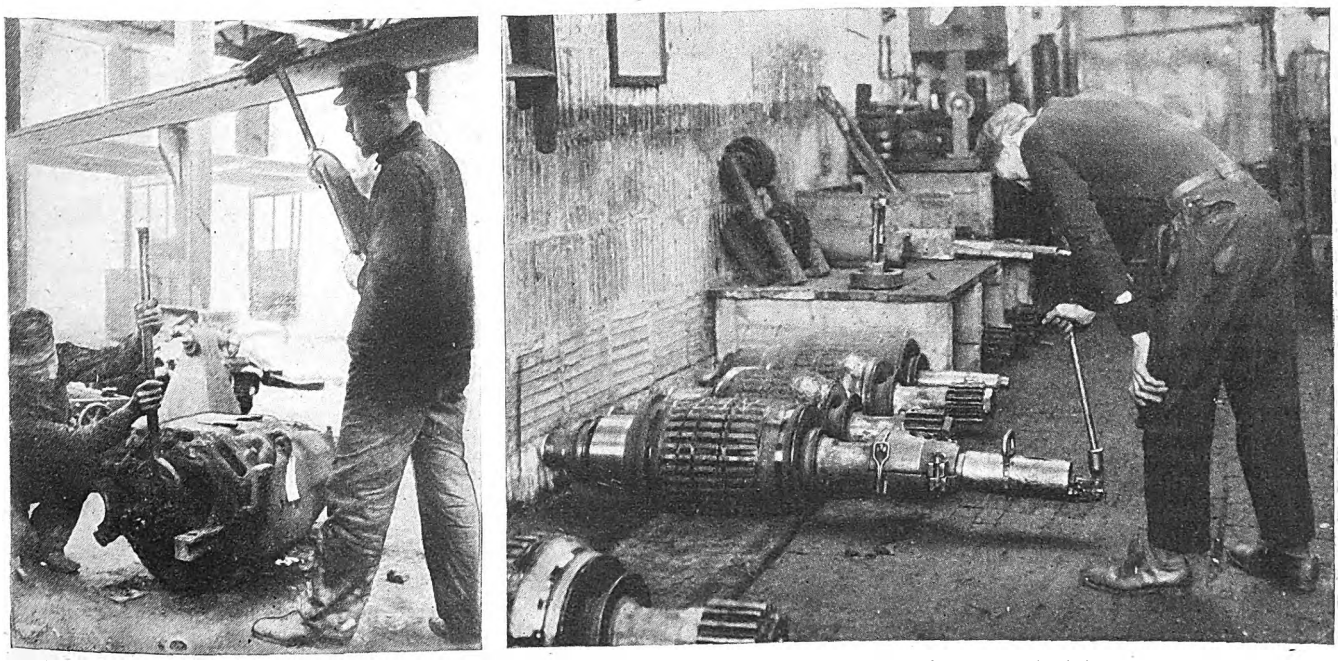
b is same as B for spur gear gage.

Dimensions in inches of discard gage for helical gears—long and short addendum

Pitch	A	a	B	b	C	D	E	F
4½	0.27	0.31	0.24	0.24	5/16	3/4	2½	3/4
4	0.32	0.36	0.24	0.26	11/32	3/4	2½	13/16
3½	0.34	0.38	0.28	0.30	3/8	7/8	2½	7/8
3	0.38	0.43	0.32	0.34	13/32	1	2¾	1 1/16
2½	0.47	0.51	0.40	0.41	1/2	1⅛	3	1⅛
2½	0.53	0.57	0.45	0.46	9/16	1¼	3½	1¼
2	0.56	0.62	0.48	0.51	5/8	1⅜	3½	1⅜

proper method for gaging the wear of the teeth at the pitch line and also the thickness at the pitch line to which the teeth should be worn before discarding. One discard gage was arranged for railway helical gearing (long and short addendum) and the other for railway spur gearing (long and short addendum). Dimensions of the gages, which were given in the 1926 proceedings of the A.E.R.E.A., pages 510-511, are reproduced for the convenience of those who are not familiar with them. It is recommended that every shop be provided with a set of proper gages so that guesswork can be eliminated in the important matter of determining when a gear or pinion should be scrapped.

Superintendents of equipment and master mechanics should welcome the use of this gage. The practice of leaving to the judgment of inspectors the decision as to when a wornout gear or pinion should be removed is



As shown at left, pinions and shafts may be damaged by driving a wedge back of the pinion for removal. There are many satisfactory types of pinion pullers (shown at right) that can be used to advantage by electric railways

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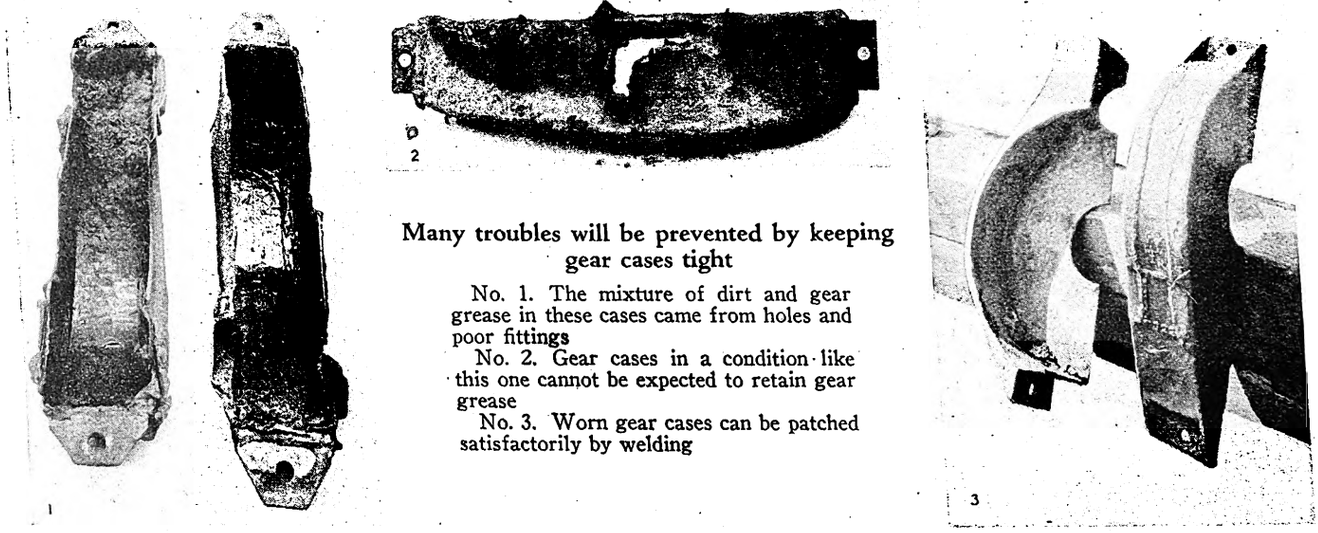


Many troubles will be prevented by keeping gear cases tight

No. 1. The mixture of dirt and gear grease in these cases came from holes and poor fittings

No. 2. Gear cases in a condition like this one cannot be expected to retain gear grease

No. 3. Worn gear cases can be patched satisfactorily by welding

unsatisfactory. The discard gage of the design shown can be used readily for tooth measurements on worn-out gears or pinions. Dimension *B* for the gage used with spur gearing is usually taken as two-thirds of the original thickness at the pitch line of a new gear and pinion. Thus for a diametrical pitch of 3 this would be two-thirds of 0.523, or 0.348 in. The dimension *A* or *a* for the depth is the correct addendum. This varies slightly with the number of teeth.

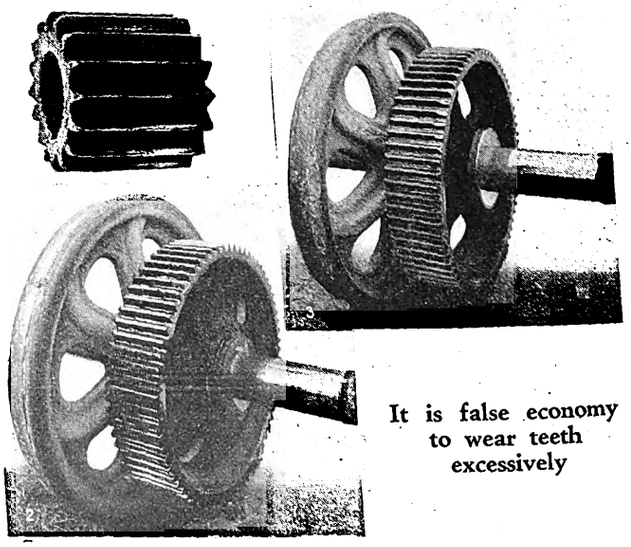
Several of the more modern tooth shapes depart from the B. & S. standard and have higher pressure angles. These include the long and short addendum tooth, the helical tooth and the wisdom tooth pinion. When cut these teeth are broader at the base and narrower at the top than the B. & S. standard, so that frequently they wear to a knife edge before they are worn sufficiently at the center of the tooth to warrant discarding. Such a condition is shown in the diagram illustrating the discard gages. After the gear or pinion is worn to a knife edge at the top it should be discarded regardless of the gage. The A.E.R.E.A. standard gages take their height bearing from the root of the tooth. The vertical legs are of such a length as to make the gage point bear at the center of the working depth and the inside slot of the gage is deep enough to provide a clearance over the top of the tooth. Where it is desired to check actual tooth dimensions the simplest and most accurate method is to get them from the gear manufacturer for each specific type of gear or pinion. If the standard gages are used a considerable number of pinions will be discarded that are now left in service; but with the discarding of the pinions there will also be discarded considerable trouble and high maintenance cost which comes as a by-product of gearing that is allowed to stay in service too long.

The best test of a good gear lubricant is to make an inspection frequently and see if the teeth are actually covered with an oil film. I have seen the lubricant so heavy that in cold weather it piled up on the outside of the gear like the waters of the Red Sea that allowed the children of Israel to pass over without even getting their feet wet. Gear life can be extended greatly with the right kind of lubricant if it is used often enough to keep the gear surfaces well covered at all times. Inspection should of course include the gear cases to make sure that the lubricant is not being lost.

Another source of trouble where the teeth are of proper shape and material and properly lubricated comes from too great spacing between gear and pinion as the armature and motor axle bearings wear. In consequence the teeth, instead of touching at the pitch line, come in contact only at the outer ends with resulting greater wear and noise from backlash.

The wear which causes this spread condition of the gear and pinion may take place not only in the bore of the bearing but also on its outside and in the frame or housing where it is held. Some wear is possible also on the outside of the motor housing. With the worst conditions there is a great increase in noise especially as the car speed changes during a run. When a change in the car speed or reversal of direction causes the gearing to change from engaging on the front of the teeth to the back, or vice versa, there is a great deal of backlash to take up, and also danger that the teeth will break because the great impact is exerted on the small area.

The correct way of course to operate gearing is with the teeth meshing at the pitch line. To approximate this the tolerances for the fit of the bearing on its shaft should be minimized and all excessive wear eliminated.



It is false economy to wear teeth excessively

No. 1. How can correct gear action be expected when pinions are allowed to wear like this?

No. 2. Properly lubricated gearing has the lubricant adhering to the teeth

No. 3. Several teeth in this gear broke as a result of leaving it in service too long. The broken teeth damaged a good pinion

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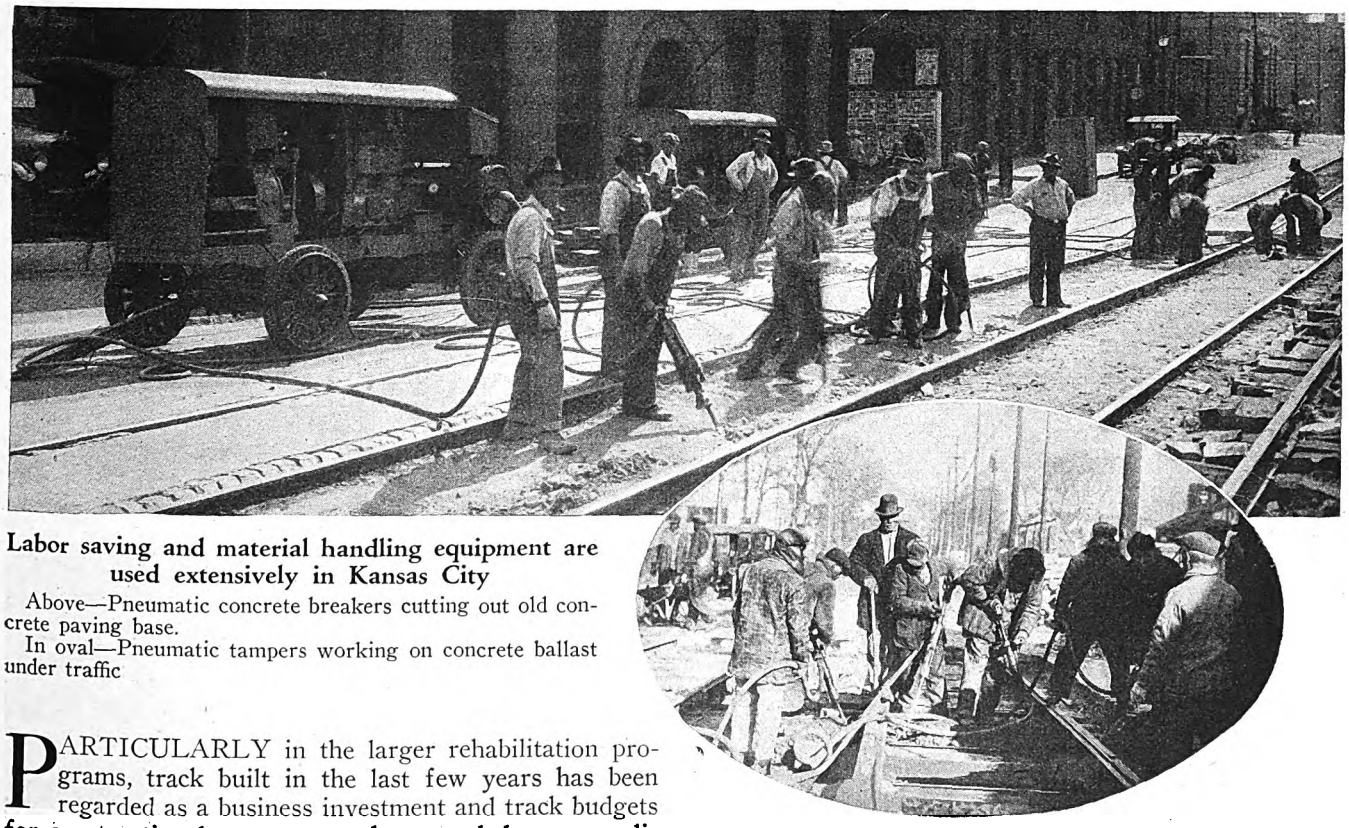
Attention to Details Is the Secret of

Low Track Cost

To reduce paved track maintenance costs the design should be modernized, labor saving methods introduced and material handling equipment used wherever possible

By T. J. Lavan
General Manager International Steel Tie Company, Cleveland, Ohio



Labor saving and material handling equipment are used extensively in Kansas City

Above—Pneumatic concrete breakers cutting out old concrete paving base.

In oval—Pneumatic tampers working on concrete ballast under traffic

PARTICULARLY in the larger rehabilitation programs, track built in the last few years has been regarded as a business investment and track budgets for construction have come to be regarded as expenditures, the control and administration of which should be efficiently handled. During the adjustment period from 1918 until a few years ago the financial outlook justified no complete mechanical and departmental organization of track construction activities. This, because of lack of new capital, the slenderness of track construction funds and because only necessary stop-gap construction was being done with a doubtful future, checked the normal American tendency toward progress and efficient methods.

This lull for readjustment of the whole industry has been followed by the present comparatively optimistic outlook and the consequent release of the latent ingenuity and ability of the leaders of track construction thought in the United States. It is this hopeful indication of the trend, which a national viewpoint indicates, as well as the increased budget estimates for track in the 1928 Statistical Number of the ELECTRIC RAILWAY JOURNAL which inspires this article. If it carries the message of better design, and improved and labor-saving installation methods to those who may not have been touched by the developments that are being rapidly made, its purpose will have been accomplished.

The outstanding trends in the design of paved track in the past season are toward permanently welded rail joints, A.E.R.E.A. standards in rail sections, the increasing use of lower rails, rail tilting, and the use of concrete ballast with the three well known types of steel ties on the market.

An analysis of the reports of paved track laid in 1927, given in the Statistical Number of ELECTRIC RAILWAY

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Carefully worked out

Mechanical Methods

are used by the Denver Tramways for handling concrete materials

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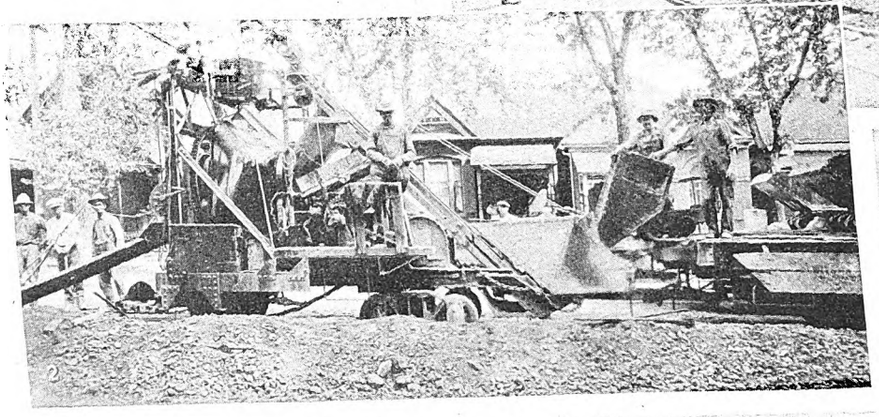

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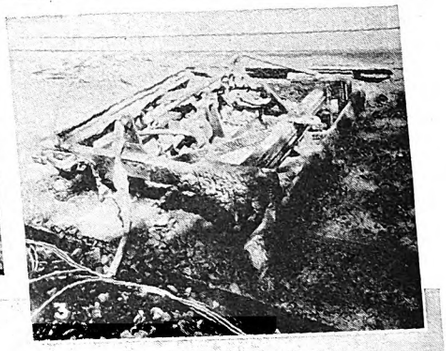

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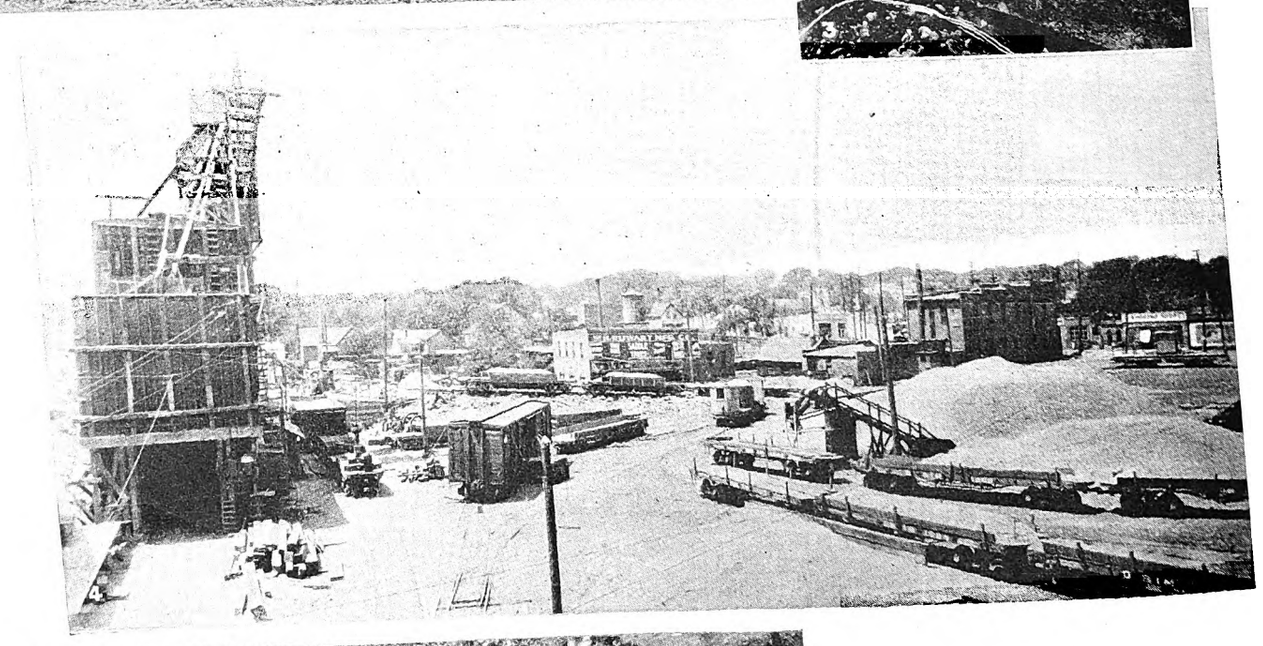

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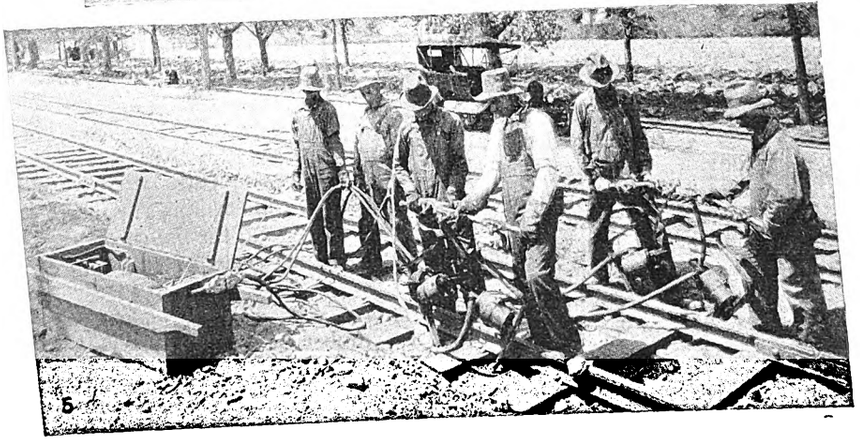

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1. Flat car carrying batch dump cars backed up to end of the mixer
2. Dumping a batch into the mixer skip. The flat car carries eighteen of these batch cars
3. Electrically operated concrete pavement finishing machine
4. Concrete material elevator is used where batch cars are loaded
5. Tamping ties with Johnson electric tampers

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JOURNAL, indicates that one type of welded joint is used in 60 to 70 per cent of the total track reported. The remarkable trend toward this joint is due in large measure to careful installation supervision by the manufacturer as well as to improvements in the design, methods of installation and improved quality of material. Too much emphasis cannot be laid on the value of field supervision in paved track construction.

The value of Association standards can only obtain full recognition by use, and the trend toward A.E.R.E.A. standard rail sections is encouraging to those whose efforts have provided the new designs. Association standards represent the best thought and a wide experience and they can be followed with assurance of their worth, if properly selected and correctly applied.

Along with the trend toward Association rails is the noticeable use of lower rail sections, usually 7 in. replacing 9 in. The appended table of rail sections, for which Twin Ties were furnished last year, as compared with rails used in 1926, indicates this trend.

Rapid acceptance of rail tilting marked 1927 track design for paved streets. The practice of tilting the rail inward so that the slope of the head corresponds to the coning of the wheel tread increases the area of contact between the rail and wheel and passes the resultant of the load through the rail, parallel with its vertical axis. The life of the rail is increased and pavement adjacent to the rail is relieved of the grinding action and transverse crushing force due to the tendency of a vertically placed rail to dip outward under load. Rail tilting has the approval of the American Railway Engineering Association's committee on track and, considering the well known conservatism of this body, it may well serve as a guide to electric railway engineers considering the tilting of their rails on paved work.

The increasing use of concrete ballast with the three well-known designs of steel ties on the market has come to the attention of all, but only to railway engineers using these track designs and others in close contact with this type of track is it apparent that here also, close field supervision and higher standards of materials and methods of installation have met early objections to steel tie construction.

Early designing in this field was frankly commercial, with wide spacing of ties, and a disregard of conditions such as subgrade and loadings which must guide every installation of track if the results are to be satisfactory. A general rule, by the logical method of design, is for the engineer to apply by comparison his local standards of bearing and drainage, or other subgrade treatment such as rolling, to all such installations and to superimpose these requirements on the manufacturers' maximum and minimum specifications of tie spacing and depth of concrete slab, respectively.

Most of the track which has been built in the last few years has been designed to eliminate to a considerable extent the necessity for maintenance work such as was needed on track built years ago. One of the principal elements in track maintenance is the failure of joints. While modern rail joints made by the welding processes are not immune to failure, there are so few failures that they are practically negligible. Unfortunately the most of the track in service is comparatively old, and the joints are the principal sources of trouble. The track is too good to be rebuilt and methods of repair are essential.

One of the worst practices is the temporary repair of rail joints in the anticipation that the track will fail completely in a few years. On many properties the same repair practices are being followed that were in use twenty years ago, although construction methods so far out of date would not be considered for new track.

The use of old methods is due to a false idea of economy. For instance, when bolted joints get loose and the wheels pound them out of shape, the common plan is to open up the paving, drive some shims or "cobhouse" blocking under the joint, tighten up the bolts and replace the paving. Sometimes where it is possible the ties are tamped and occasionally the joint plates are turned around or upside down and welded onto the rail. The idea seems to be that the plates are there and must be used. No one would think of using a plate that would not fit in connection with a new rail, and the necessity for using a plate that fits is even greater where the rail is worn.

In some of the larger cities it costs between $50 and $60 to open the paving sufficiently to do any kind of work on a joint and replace the paving in permanent form. If the repair itself is not of the right kind and well done it does not last for any time.

The false economy is in the failure to do the work right when the joint is opened, because the additional cost of the permanent repair over the temporary one is only $4 to $5 at most. In one particular instance the joints were opened up and repairs were made at the cost of about $50 each. Within the last three or four years such repairs have been made on the average once a year. The cost of permanent repairs was considered too great, but had they been made the first time it was necessary to open the joints the subsequent openings would have been unnecessary. Assuming that the original cost of the repair had been increased $10 per joint, making a total of $60, the cost for the past four years would have been only $15 per year. With the system of temporary repairs in vogue the annual cost has been $50 per year. In justification the track engineer usually says that he hoped the repair would be permanent.

On the contrary, on some properties the plan of making permanent repairs has been adopted with excellent results. In two cities the writer has in mind the joints were giving considerable trouble. They were opened up, thermit welded and paved in again. Nothing more has been spent on them although these repairs were made many years ago.

No matter what process is used to repair the rail joint itself the correct plate should be purchased and fitted up, the ties should be tamped properly under the rail so that they support it as the original design called for, and shims and "cobhouse" blocking should be avoided entirely.

A form of so-called repair that has been tried is to build up the top of a cupped joint with the arc welder without going to the expense of opening up the joint. While arc welding is an excellent thing it cannot take the place of a proper repair. It does not tighten up the bolts and it does not put a support under the receiving rail, where it is needed with bolted joints. Where such careless practices are used the welding itself is likely to be careless. While in some companies the superintendents are very careful to instruct their operators, entirely too many of them put arc-welding equipment in the hands of a common laborer and expect him to get results. This attempt to do expert work by common labor, which at best can save only a few cents in the cost of a joint, is another false economy. The building up of rail joints or special work with an arc welder should be done carefully.

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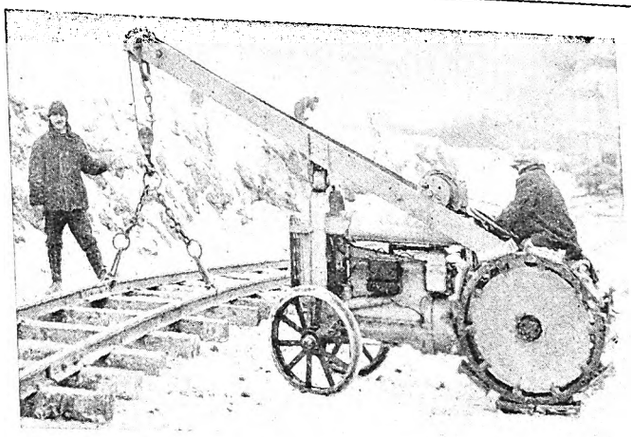

Tracks that formerly took twenty men with jacks to move are placed now with a 1-ton Fordson crane

Another source of difficulty in welding joints is the use of improper materials. Some superintendents attempt to use any kind of steel for welding in place of the correct welding rod. Many manufacturers are selling welding rods, and the tendency is to purchase the cheapest. There are welding rods on the market that have been tried and proved. The difference in cost of the best welding rod over the period of a year is picayune compared with the damage that can be done by the use of unsatisfactory rods whose merit has not been proved in connection with steel of the type in the rail.

The evil of these poor types of joint repairs does not end with the need to do them over again after a year or so. The rail ends are likely to be damaged beyond the possibility of further repair. When this happens it is necessary to cut the joint out entirely and put in a short piece of rail, making two joints instead of one, and necessitating further opening of the paving. These cut-in pieces are seldom satisfactory and the life of the entire track is endangered.

Another place where there is a good deal of false economy in track maintenance is in repairs to special work. When special work pieces get broken or when the hard centers get loose repairs can be made to a certain extent. Continual patching, or what is worse, patching on the patches, is exceedingly expensive. Sometimes where frogs or switches are broken they can be taken out of the street, taken to the shop and welded so that they will be made serviceable again for years. Here again a real repair pays where patching, shimming and similar practices simply waste the money.

Production Methods Adopted in Construction

In the actual construction the development which is most impressive is in the adoption of mass production methods in the larger programs and their use with practical limitations by the smaller properties. The mechanization of track construction inspires the thought that modernizing methods will affect maintenance by reducing costs and improving quality of track. It is an axiom in mass production that any repetitive operation can be more accurately, uniformly, dependably and economically performed by machine than by hand labor. Use of machinery and handling equipment in paved track construction needs no theoretical justification, as a glance at the highway field will indicate. The ideal in the development of mechanical and production methods in track construction, *i.e.*, the displacement of all common labor by machinery, may never be attained. However, the possibilities are predicted by modern highway construction technique where, in the opinion of road building engineers, the addition of one or two special machines would today make concrete road building completely mechanical.

Development of special track-laying machinery awaits only acceptance of the principles of mass production and their adoption to a greater or lesser extent as the size of the program, local conditions, and the amount of money in the construction budget may determine. A startling comparison with yesterday's methods is seen in a recital of already available labor saving equipment and track machinery which, without doubt, will find wider use next season than it has had in the past.

Drive No Spikes With a Maul

The old familiar plan of driving spikes with a maul is taken as the first illustration because it is being replaced by the latest of the pneumatic track tools, the spike driver. On one steam road, in spiking 39 ft. rails with 26 ties to the rail length the time required with two spike drivers was one minute and 30 seconds per rail as compared to ten minutes per rail length with a four-man gang, spiking by hand. Pneumatic or electric hand tools, while accepted on the many large city properties, have still to find their way into general use on the smaller ones. Yet the savings possible justify their use even on the smallest jobs. Among this class of tools may be mentioned pneumatic and electric track drills, screw spike and joint bolt wrenches, concrete breakers, wire brush cleaners, scaling tools and portable saws. But most important with such tools is their consistent use with standard rules issued to foremen requiring their use on all work with definite performance tasks set.

Tamp No Ballast by Hand

An attractive field for labor saving is in tamping ballast, but a consideration which far outshadows labor cost in building paved track is the elimination of the human element and the assurance of a thorough and uniform contact of the ballast with the bearing surfaces of the ties and filling in all pockets and voids.

The use of pneumatic and electric tampers is so general that it may seem unnecessary to point out their advantages for tamping stone ballast in paved streets; yet it is notable that on many properties the hand pick and

COMPARISON OF THE COSTS OF MACHINE TAMPING VERSUS HAND TAMPING

Based upon the performance of these machines for several months, working exclusively in stone ballast. The cost is given in "tie parts," assuming four parts per tie, one inside and one outside each rail, and the expression "single" or "double" tamping refers to the tamping of a "part" on one side or on both sides of the tie.

Machine Tamping—One four-tool portable compressor outfit.	
Interest on investment, per day, at 6 per cent	$0.57
Depreciation on basis of 5-year life, per day, at 6 per cent	1.61
Repairs (from a 5 months' record), per day	.94
Gasoline, 2½ gal. per hour for 6½ hours at 27 cents	4.39
Oil, one quart, at 50 cents per gallon	.12
Wages, five men at 40 cents per hour, for eight hours	16.00
	$23.63
Number of tie parts double tamped per day	612
Cost per double part tamped	$0.038
Machine Tamping—Four tamping tools without compressor outfit—air taken from existing air line, for which no charge is made.	
Interest on investment per day, at 6 per cent	$0.08
Depreciation on basis of two year life, per day, at 6 per cent	.61
Repairs, estimated	.25
Wages, five men at 40 cents per hour, for eight-hour day	16.00
	$16.94
Number of tie parts doubled tamped per day	612
Cost per double part tamped	$0.027
Hand Tamping—With picks, on a five-man basis.	
Depreciation and repairs, estimated, per day	$0.25
Wages, five men at 40 cents per hour, for eight-hour day	16.00
	$16.25
Number of tie parts single tamped per day	320
Cost per single part tamped	$0.050

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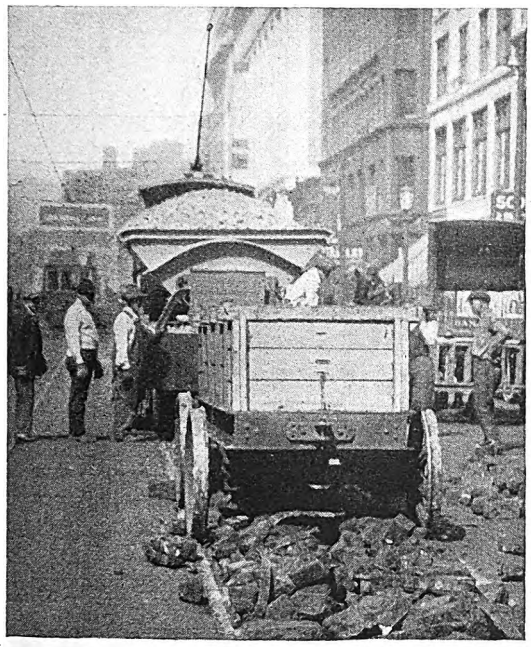

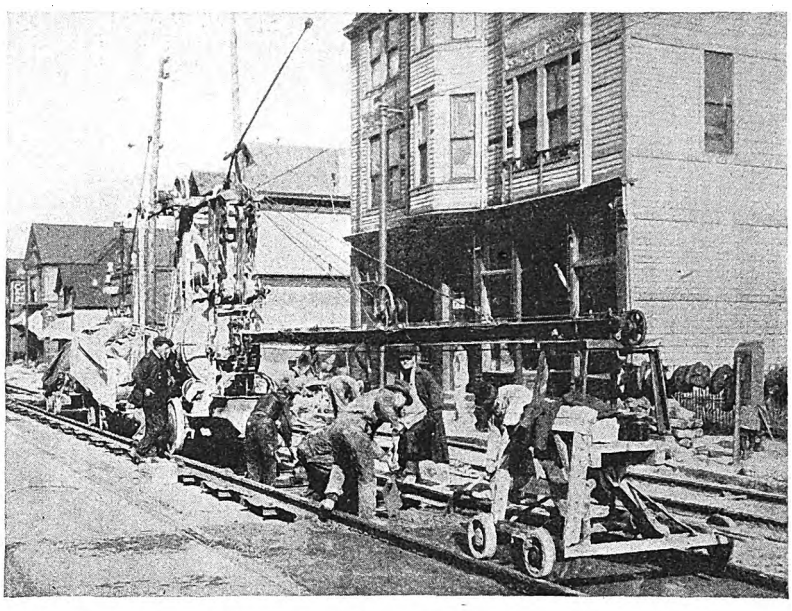

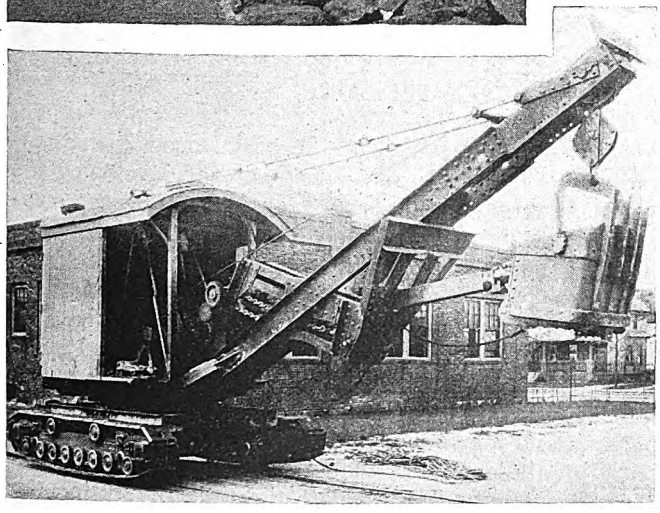

The Cleveland Railway has been particularly active in the use of labor-saving equipment in track construction

At top, left—The paving plow in operation on one of Cleveland's streets.

Top, right—An electrically driven concrete mixer with extension boom and traveling dump bucket is used for concreting tracks.

Lower, left—An electric shovel with combination caterpillar tractor and car wheel truck is found convenient.

tamping bar are in every-day use. The savings possible make the equipment an excellent investment. The example of comparative costs given on page 450 is representative.

For concrete ballast the new principle of compression tamping completely mechanizes this operation, at the same time improving the result. The latest machine for compression tamping is driven by a 550-volt motor. It can be connected directly to the trolley circuit and is operated by one man. The theoretical production capacity of the machine is 3,000 single track feet per day, which is ample for the usual concrete mixer, which will control the production speed on work which follows.

A new principle in track construction is involved in compression tamping. While theoretically concrete is a fluid, it is well known that even after thorough mixing it contains air and water pockets and is capable of considerable reduction in volume as produced during the tamping and puddling process. Moreover, this principle avoids mere puddling of the mix, which has a tendency to cause a settlement of the heavy aggregate. The 300 to 500 lb. of compressive force applied by compression tamping, forces the concrete, without disturbing the relative position of the aggregate, into complete and full contact with the tie bearing surfaces.

The labor saving obtained is equal to three man-hours times the number of hours in the working day, for each day's production.

One of the most obvious labor leaks in usual methods of construction is in the moving of ballast materials by hand on the track, either into the track trench or into concrete mixer skip. That savings result by using material handling equipment hardly needs supporting data and, therefore, merely examples of advanced practice are indicated as obviously saving large sums in man-hours of time.

One carefully planned mechanical method is used by the Denver Tramway Corporation on concrete. In the material yards, mechanical conveyors and elevators take material from pits under hopper-bottom gondola freight cars to elevated storage, where it is dropped directly into narrow-gage batch cars of the end-dump type, eighteen of which are carried on a flat car of Denver's standard gage. The flat car floor has three narrow gage tracks and switches, leading to a stub single track at the end of the flat car on which the batch car is in dumping position, over the skip of the mixer. Thus all materials come to the mixer ready batched, with only three men's time chargeable against the handling operation.

A variation of this method is the use of Differential dump cars in getting the material out to the street where it is handled by Haiss batch-bin type elevating loaders and light dump-body trucks direct to the mixer skip. This development was used on Kansas City work in 1927. Commenting on it A. E. Harvey says, "The inclosed statement shows the difference between cost of placing concrete with our mixers which are loaded by hand and wheel barrows at a cost of $2.67 per cubic yard as compared with $1.29 where a 21-E mixer is used and is charged by trucks which are in turn loaded with a Haiss loader. Thus you will note, that the use of the loaders and large mixer makes a saving in labor of 51 per cent."

The detail figures in Mr. Harvey's comparison are given in the accompanying table.

Some practices common in trackwork not only waste time but are apt to cause personal injury. One of these

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COMPARATIVE COSTS OF PLACING CONCRETE IN KANSAS CITY USING OLD AND NEW METHODS

	Cu.Yd. per Linear Foot, Single Track	Cost of Placing Single Track Per Foot	Per Cu.Yd.
Concreting with old method, using one mixer on base course and one on top course, loading both mixers with hand labor on first half double track..	0.277	$0.74	$2.67
Concreting with 21-E Rex paver on base and top courses, using one Haiss loader on rock and one on sand, loading into Ford trucks and hauling to mixer. Cement was thrown on top of batch truck when truck passed cement car, on second half double track	0.426	0.55	1.29

Note:—No finishing or curing is included in above costs since they would be the same with either method.

Common labor was paid at the rate of 30 cents per hour and trucks $1 per hour.

Average concreted per day with old method, 406 ft. S. T. or 112 cu.yd.

Average concreted per day with new method, 570 ft. S. T. or 243 cu.yd.

All variations of the above methods attempt to replace the shovel and wheelbarrow as completely as possible in handling ballast and concrete materials on the street.

TYPE AND HEIGHT OF RAIL USED ON STEEL TWIN TIE INSTALLATIONS IN 1926 AND 1927

Section Number and Weight	Height, Inches	Type	1926	1927
56-lb. relayer	...	.....	x	x
60-lb. Lorain steel 263	6	T	..	x
60-lb. A.S.C.E.	4¼	T	x	..
60-lb. A.R.A.-A	4½	T	..	x
70-lb. A.S.C.E.	4⅜	T	x	x
72-331 Lorain Steel	6	T	x	x
73-274 Pennsylvania Steel	6	T	..	x
73-274 Bethlehem Steel	6	T	x	..
75-lb. A.S.C.E.	4 13/16	T	x	..
80-lb. A.S.C.E.	5	T	x	x
80-lb. A.R.A.-A	5⅛	T	x	x
80-220 Pennsylvania Steel	5⅛	T	..	x
80-335 Lorain Steel	7	T	..	x
82-505 Lorain Steel	7	T	x	..
85-lb. A.S.C.E.	5 3/16	T	x	..
87-381 Lorain Steel	6½	Girder	x	..
90-lb. A.S.C.E.	5⅜	T	x	..
91-282 Bethlehem Steel	7	T	..	x
93-507 Lorain Steel	7	T	x	x
95-400 Lorain Steel	7	T	x	x
96-357 Lorain Steel	7	Girder	..	x
100-lb. A.E.R.E.A.	6	T	x	x
100-lb. A.R.A.-A	6	T	x	x
100-lb. A.S.C.E.	5¾	T	x	x
102-516 Lorain Steel	7¼	T	x	x
103-478 Lorain Steel	7	Girder	x	x
104-396 Lorain Steel	8	Girder	..	x
105-lb. Carnegie 10524	6	T	..	x
114-480 Lorain Steel (guard)	7	Girder	x	..
115-462 Lorain Steel	7	Girder	x	..
122-407-A Bethlehem Steel	7	Girder	x	x
127-397 Lorain Steel (guard)	7	Girder	x	..
128-404 Bethlehem Steel	7	Girder	x	..
134-406 Bethlehem Steel	9	Girder	x	x
140-468 Lorain Steel (guard)	7	Girder	..	x
141-395 Lorain Steel	9	Girder	..	x
147-95 Maryland	5 3/32	T	..	x

x—indicates year used.

is the handling of rail from the curb or the trench side into the trench by means of tongs. Safety alone dictates the use of a mechanical method for handling rail, but in addition large labor savings are possible on extensive work. Mechanical handling permits the setting of the rail in close alignment and approximately to surface, reducing the subsequent labor. Both simple and elaborate crane equipments are available. A recent adaptation, the Fordson tractor illustrated, offers the advantages of mechanical handling at a cost well within the limits of small property budgets.

Removal of old track and excavation for new construction offer similar opportunities for saving labor. Many improved devices have shown startling economies as compared with hand work. For instance, the concrete breaker was used on old 6-in. thick concrete paving foundation. For one-half the devil strip, between the rails of standard gage track and 1 ft. outside the rail, the machine broke 45.8 single-track feet per man-hour. Hand methods with picks, shovels, chisels and sledges broke the concrete at the rate of 3.48 single-track feet per man-hour.

With the special plow illustrated, which is drawn by a motor car, the removal of granite block was 113.23 ft. per man-hour, while by hand, using bars, the equivalent removal was 2.12 ft. per man-hour. It is unnecessary to give more examples to prove the saving of mechanization of construction. The following example from Kansas City shows the comparative costs of excavation by hand and by machine:

COMPARATIVE COSTS OF EXCAVATION, KANSAS CITY

	Cu.Yd. per Linear Foot, Single Track	Cost of Placing Single Track Per Foot	Per Cu.Yd.
Excavating by hand, first half of double track	0.365	$0.82	$2.25
Excavating with Insley, second half of double track.	0.365	.66	1.81

Note:—No dismantling is included in excavating cost since this would be the same using either method. Common labor was at the rate of 30 cents per hour.

	Feet of Single Track	Cu.Yd.
Average excavated per day:		
By hand	565	206
With Insley	632	231

The fundamental principle involved may be stated as follows: Human energy can be profitably employed only for the control and guidance of power, never for its supply.

A corollary of this in the construction of paved track is that the power used should as far as possible be drawn from the overhead, that is, electric shovels and electrically driven tools of all kinds should have preference over those of gas or steam. Even on small properties and for short lengths of paved track work the rental of this type of equipment will make a net saving on the removal of old track item.

A notable development of the past season is the general adoption of field control methods for developing the maximum strength of concrete mixtures. Average compressive strengths as high as 3,000 lb. on all concrete placed in the track structure are being obtained in many instances, amounting to an increase of as much as 30 per cent over former results on the same properties.

Such tests include the sieve test for the size and grading of the aggregates; the simple water test for soluble matter in gravel; the slump test for checking the water content and test cylinders for data to serve as a check and control of the quality of materials used and the strength of the concrete and to regulate the time of putting the finished track in service.

A valuable and simple addition to all concrete mixers is a timer for checking the mixing time. Where used, a specification is given for period of mixing, which should be rigidly adhered to. Often this may save time and increase the daily production of concrete. In this way the rapid increase in strength and uniformity of concrete for mixing periods up to two minutes can be taken advantage of on the work.

A development of the past few seasons which is worthy of note is the practice of detaching the inspection department entirely from construction. With this type of organization complete specifications are written on all the track and the inspection department reports directly to an operating vice-president or other executive above the construction department. It results in close adherence in the field to both material and method specifications. It has been suggested the latter might be amplified to include performance or production requirements.

The observations which are presented in the foregoing are in no way intended to be inclusive of all that might be done to improve paved track construction and so reduce the maintenance of such track in the future, but they take their strength as valuable innovations in track practice from the fact that they indicate modern trends and support the proposition that to reduce maintenance the logical place to start is to modernize design and methods of construction.

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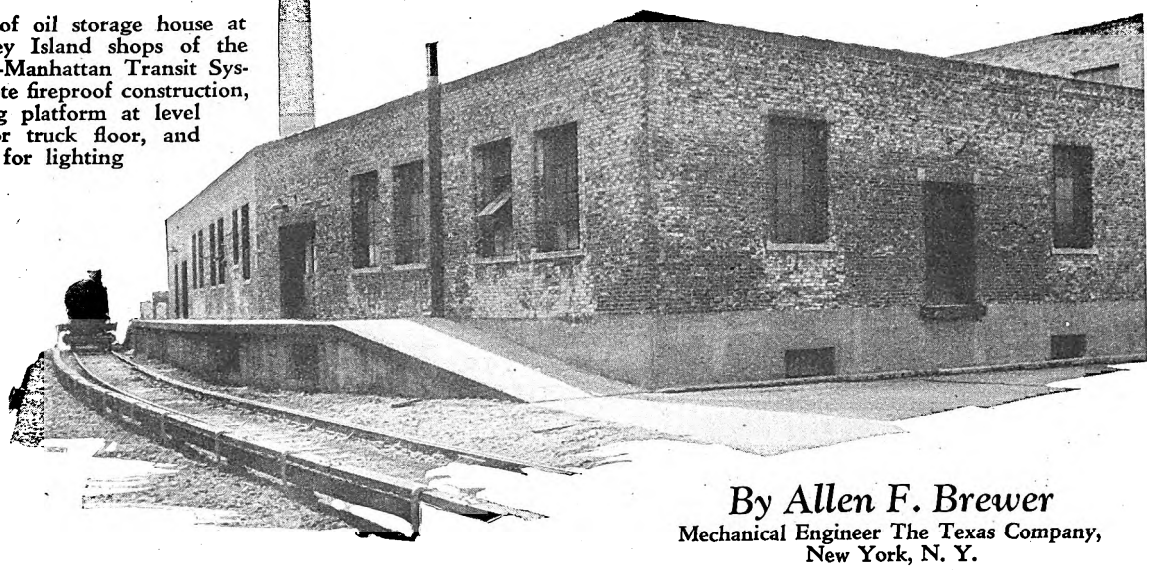
A Good Lubricant can be Ruined by Improper Handling.



Exterior of oil storage house at the Coney Island shops of the Brooklyn-Manhattan Transit System. Note fireproof construction, unloading platform at level of car or truck floor, and windows for lighting

By Allen F. Brewer
Mechanical Engineer The Texas Company, New York, N. Y.

DEVELOPMENT of the storage and handling of lubricants has been most interesting. Once oil storage was regarded as relatively unimportant. Usually the darkest, dirtiest corner in the electric railway shop or storehouse was deemed good enough. In fact, there has ever been an association of grease with dirt. Note the common usage of the term "greasy." Yet modern street railway lubricants are among the most highly refined of oil products from the viewpoint of actual purity and freedom from dirt. If they ultimately show contamination, storage and handling practices should be investigated. It is better, however, to make such an investigation a matter of insurance against contamination, rather than a means of correction after it has occurred. Rolling stock and power plant equipment will be protected more completely thereby, for effective lubrication can more nearly be accomplished and maintained.

After receipt the responsibility of the consumer commences. Any lubricant is only as good as the care it is given in storage and handling. Regardless of how carefully any lubricant may be refined or selected, precaution must be taken to preserve its purity prior to use. Just because a compressor oil is obtainable with practically no water or foreign matter content, is no assurance of its ultimately giving satisfactory service if, for example, the shipping container has been handled roughly, allowed to remain exposed to the weather, or stored so that foreign matter can gain entry. This is true especially of wood barrels, where cracking or warping of the staves or heads through weathering or careless handling, will in all probability cause particles of glue to be chipped loose, or reaction brought about between the glue lining and moisture due to entry of the latter through cracks, which finally will get foreign matter into the oil and reduce its value as a lubricant.

Storage and handling of lubricants in the average

Oil Handling Practices That Should Be Eliminated

AVOID improper location of the oil house. Much time and energy will be saved by locating the oil house centrally.

When underground tanks are installed don't forget that an adequate foundation will save much trouble.

Much annoyance will be avoided by seeing that all pipe joints are made up tight.

Neglect of fireproof provisions may prove very costly.

Dirt and refuse are enemies to lubrication storage. Don't employ careless attendants.

Don't allow oil to drip.

The "help yourself" habit will not work out satisfactorily with any well-organized system for keeping records of lubrication.

Water will contaminate a lubricant as well as dust and dirt. Keep all tanks or containers covered to prevent entry.

Don't forget that full barrels or drums are heavy. Use two men to handle where necessary.

Be sure that any accumulation of oily waste is not permitted. Rags or sawdust have no place in an oil house.

Don't forget to keep grease drums covered.

The boring of holes in wood barrels or the reaming out of existing holes should not be permitted.

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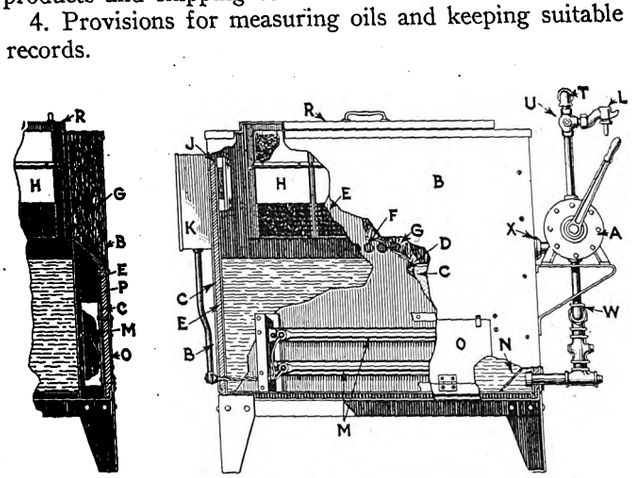
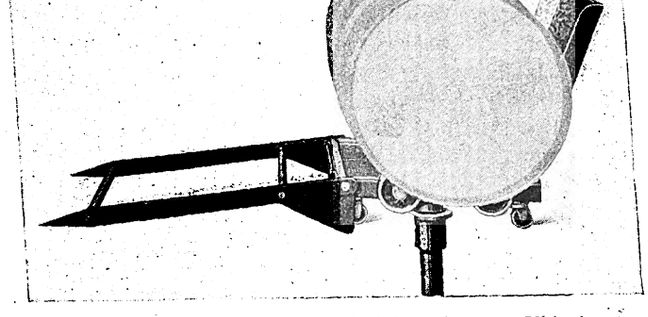
electric railway system involves certain distinct factors which include:

1. Design and construction of the storage facilities.
2. Type, size and arrangement of equipment, such as pumps, heating coils and gages.
3. Handling equipment available for moving or lifting products and shipping containers.
4. Provisions for measuring oils and keeping suitable records.

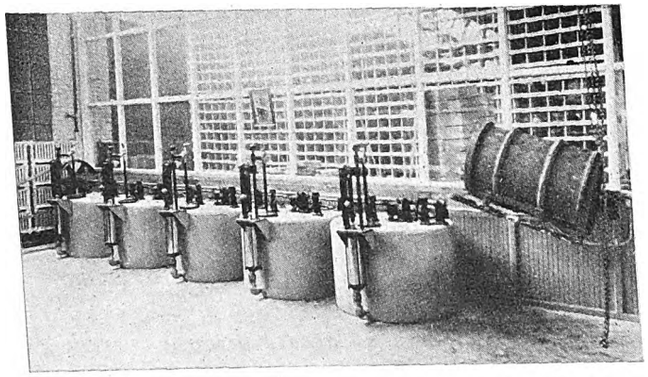


Sectional view of a waste-soaking outfit

A. Pump
B. Outer tank
C. Asbestos insulation
D. Metal lining over asbestos
E. Inner tank
F. Hot air ports
G. Mineral wool insulation
H. Waste containers with screen bottoms
J. Thermostat
K. Magnetic switch
L. Draw-off nozzle
M. Heating elements
N. Strainer
O. Hinged door
P. Heating chamber
R. Hinged cover
T. Hose connection
U. Three-way cock
W. Hose connection for draining barrels
X. Overflow pipe



A combination skid and barrel draining device. This is very handy for emptying the contents of drums or barrels into underground or basement tanks, in a clean and economical manner



Where oil storage tanks must be located in the main store house, the oil room should be partitioned off from the other part as shown here. Only those employees who have to do with the handling of lubricants in storage should have access to the oil room. Other store house personnel should be kept out

5. Methods of distribution to the various units, departments or shops.
6. Management of the storehouse.

The primary requisite for any road using a considerable volume of lubricants is a central storage house, or at least a special room from which lubricating oils and greases can be issued in suitable quantities as needed. Whether or not any road will be justified in going to the expense of constructing an independent oil house will depend to a great extent on its size and the amount of equipment.

There will be considerable expense attached to such an installation. Many roads adjacent to oil supply depots set aside a corner of the main storehouse for lubricants, and keep them in the shipping containers. There is an objection to such oil room storage, in that there is considerable possibility of contamination. Dirt sometimes will be swept into the drip pans and measures. There will also be considerable chance for leakage and wasting of oils unless an unusually careful employee has complete charge and keeps the room locked and inaccessible to all others.

Wherever a detached oil house is warranted or an oil room is set aside, it should be fireproofed with brick, tile or concrete walls and floor, and a tile, metal or slate roof or ceiling laid on steel beams or rafters. The floor should be fitted with drains.

Only recently a railway was inspected which prided itself on its oil storage facilities. An oil room had been laid out, measuring pumps with drains installed, the tanks located below grade, regular lubricating accounts kept and all employees educated in proper lubrication. But, below the main floor there was a basement with a dirt floor, and it was covered with several inches of oil, mud and shavings. In one corner were the storage tanks, in another a heterogeneous mass of broken barrels and junk. Nor was there any provision for heating. This might be considered a good example of how oils should not be stored. There must have been oil leaks, else how came the oil on the floor? Without doubt the tanks ultimately would suffer for water and mud are corrosive.

Light is important. Normally, there should be as few doors and windows as possible commensurate with the amount of light required, and those should be of the steel frame or roller type, fitted with wire glass and automatic closing devices.

The location of the oil house is important. An appreciable time will always be lost in handling heavy lubricant containers and there is possibility of damage both to lubricants and containers if the latter are rolled or tumbled about unnecessarily. When possible the oil room or house should be as close as possible to the railroad siding, dock or street. Thus the containers will be subject to the least possible handling.

Where oil or grease drums or barrels are to be handled from one level to another, hoisting is involved. Hoisting is not only expensive, but entails severe handling. Wood barrels especially will suffer, and warped and cracked heads, sprung seams, or the jarring loose of particles of the glue lining, often will occur. Any damage to the container which may break the seal and lead to entry of water or foreign substances, is serious.

"One-level" handling is best. The platform of the oil house or storage room should be on a level with the car or truck floors. Then the containers can be rolled, trundled on hand trucks, or handled by a portable con-

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veyor, directly to the filling hatch of the storage tanks or to the hoisting device above the tanks.

As a rule it will be practicable to build an oil house with a basement for the bulk storage tanks. The main floor in such a house would serve as the receiving and delivering room. In many such installations all tankage is kept below the floor level, this area being reserved entirely for delivery pumps and office space.

If but small quantities of certain products are to be stored for any length of time, it will save space and expense to keep them in the shipping containers rather than to transfer them to tanks. For car oils or other bulk lubricants permanent tankage is best.

Lubricants can be delivered to the shop or barn either in bulk, by tank car or boat, or in steel drums, barrels or cans. With bulk delivery, the location of the tanks with respect to the delivery level is naturally important. Usually under such conditions the lubricant is transferred from the tank car or boat through a hose connection. The same hose should never be used for delivery of black oils and lighter lubricants.

Gravity flow is quickest and cheapest. It is necessary to locate tank filling hatches below the level of the outlet valve of a tank car. With boat delivery, pumping generally is necessary. Gravity delivery will also facilitate handling package shipments in drums, barrels, or cans.

When pumping is necessary care must be taken in the location and operation of valves. With a number of tanks there will be a possibility of drawing some inferior grade of oil into the suction line to contaminate a more highly refined product.

Most effective handling of lubricants requires control of oil house and tank temperatures. Where possible basement or sub-surface location for an entire tank or at least the major part of it is desirable as it will not be subjected to as wide variations in temperature, if the building is of relatively solid construction. Frequently the basement can be closed sufficiently for temperature control by sealed trapdoors, and the entire room kept at the requisite temperature for pumping the heavier lubricants.

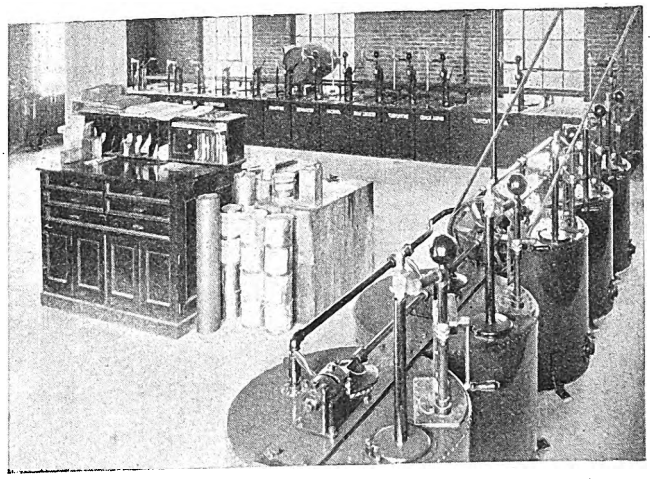
Wide temperature fluctuations may lead to sweating and condensation of moisture within the tanks. Compressor oils and the like can be seriously contaminated in this manner. Yet, retention of heat within the tanks is necessary. It would be folly to spend money on tanks, pumps and other expensive equipment, and set the tanks in a semi-covered basement or exposed to the weather.

In the winter the temperature may drop below the pour test of car oils so they will become too sluggish for the pumps to handle properly. Too often this is the basis of complaint that the oil is too heavy. When heavy, viscous products such as gear lubricants, greases, and compounds are to be stored steam heating coils should be installed in the storage room or surrounding the tanks where temperatures may vary over a wide range. This will permit accurate regulation of temperatures, and overheating will not be so apt to damage certain products. Heating by exhaust steam is most economical.

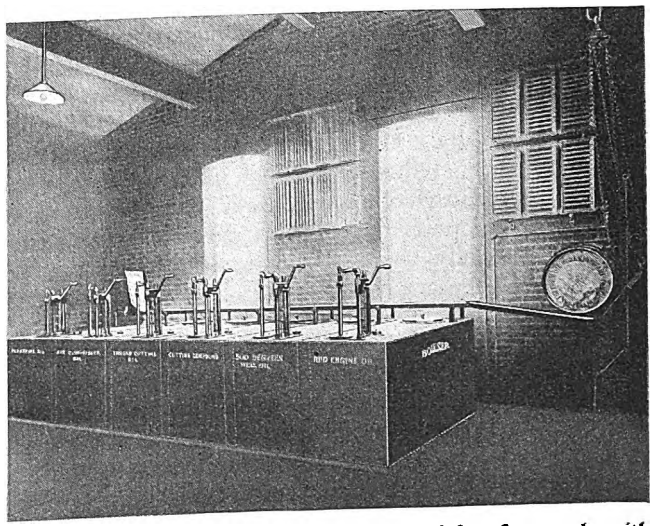
Accessory equipment such as pumps, meters or other measuring devices and portable elevators for hoisting or lowering barrels, and so on, are always advantageous. Sealed pumps should be used wherever practicable for delivering fluids from storage tanks. Often such pumps measure automatically the amount withdrawn, which facilitates keeping records and checking oil consumption. Considerable time and labor can be saved and the attendants can fill orders promptly. It also insures that the oils are kept free from contamination. Records of daily, weekly and monthly lubricant consumption should never be under-estimated. The effect on the morale and the economies in consumption of lubricants, will be surprising where employees must follow a definite procedure in the obtaining of their necessary supplies.

When barrels or drums must be hoisted frequently to the top of storage tanks or to emptying racks a portable elevator should be installed. This will facilitate handling and reduce the probability of damage, for a dead weight of from 400 to 500 lb. will tax the strength of two average men. A suitable track along the tops of tanks which are to be filled from barrels or drums is excellent. If this is at a sufficient height to facilitate location of the bungs over the filling hatches, there will be little chance for waste.

On certain roads the distribution of lubricants from the oil house or oil room involves a loss of time. On the other hand, effective distribution will tend to prevent contamination. The manner of distribution will depend on the location and number of units served. Where there are a number of shops or departments it may be most economical to deliver by motor truck, covering perhaps the entire yard at one trip. Otherwise hand truck



Oil storage tanks can be arranged in an oil house to leave space for storage of package lubricants and the office desk



Interior of an oil house showing a battery of first floor tanks with quart measuring pumps. Note barrel hoist and track extending along tops of tanks to facilitate draining and insure cleanliness. Also note provisions for side wall heating

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delivery will serve the purpose. With car oils it will often be found advisable to supply the rolling stock departments with approximately 50 gal. at a time.

Cabinet type storage tanks, each with a hinged cover, are suitable for car oils. Such tanks are usually fitted with measuring pumps, and built so that any drip drains right back into the tank.

Storage racks for barrels and drums should be built of steel, and so that individual containers may be removed quickly and independently. Good practice is always to store even the cheaper lubricants in the oil house to keep them warm. They should always be stored on the side with the bung down. It is usually inadvisable, however, to use wood barrels for lengthy storage of lubricating oils, on account of the possibility of contamination or loss from leakage.

A dirt-proof method of handling lubricants from barrels directly to lubricating equipment. This is adaptable to gear lubricants, which are to be subsequently applied by a high pressure compressor as shown. Each turn of the crank measures one pound of lubricant

Wood barrels have an appreciable salvage value, and in good condition they are returnable to the oil distributors, so care should be taken to prevent damage.

Holes should never be bored in the heads nor a bunghole reamed out, nor should a bung be driven entirely into a barrel. Bungs should be removed by tapping the bung stave lightly with a wooden mallet or bung starter and then using a chisel or bung pick.

Wood barrels, when empty, are subject to warping of the staves and heads if stored on end or exposed to the weather especially if water is allowed to collect on the heads, or if they are exposed alternately to the sun and excessive dampness.

Gear lubricants and greases in general cannot be pumped readily at normal oil house temperatures. Perhaps the most extensively used semi-solid product in electric railway service is the straight mineral gear lubricant of comparatively high viscosity. Normally such a product is extremely durable and lends itself readily to bulk storage, and sufficient heating to permit pumping.

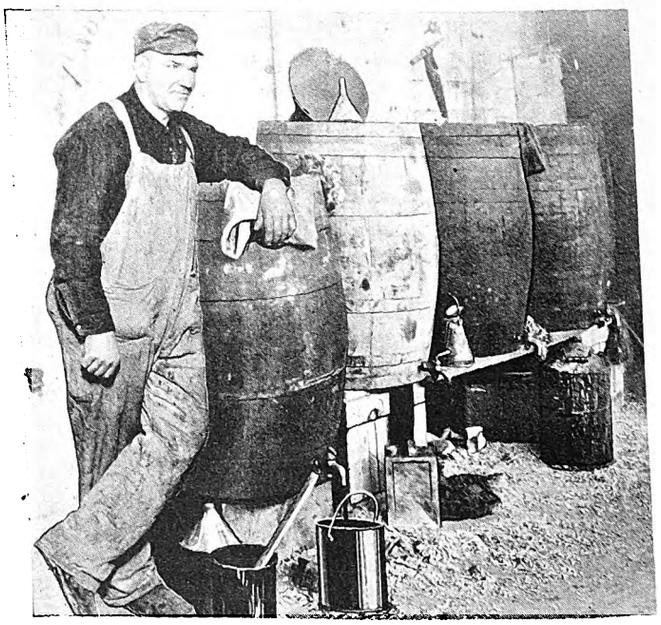
With greases, that is, products composed of a mineral oil and soap, the amounts on reserve should be held to a minimum. Certain greases may separate and revert to the original components, especially when not refined carefully. Separation can be identified by observing that oil tends to collect in depressions in the grease when allowed to stand for any length of time. Heating of certain greases may also promote separation.

In any grease, the lubricating constituent is the oil content. The soap serves chiefly as the carrier. The best grease is that with the most homogeneous mixture. If oil separates from the soap it is logical to expect that effective lubrication cannot be assured. Grease, therefore, should be bought in such quantities that it always is as fresh as possible, and the shipping containers should be stored under a temperature as uniform as possible.

With manual handling care must be observed to protect all such lubricants against contamination. A clean spoon or paddle should be used, and only sufficient lubricant taken for immediate needs. It is easy for the foreman to estimate the quantity that should be issued.

Except when in use, the grease containers should be kept tightly covered. For wooden grease barrels, a sheet metal top will be found advantageous; it can be cleaned readily and kept in proper shape.

In the storage, handling and usage of lubricants best results will be obtained by putting the entire matter under the supervision of the master mechanic, shop foreman or a capable lubricating engineer. There is a decided advantage in having a lubricating engineer, especially if his experience combines practical operation and maintenance and familiarity with the methods of refinement and the characteristics of the various lubricants. Not only should he reduce waste and keep down lost time, but he can keep proper records, develop specifications, purchase lubricants and test them. Whoever has charge of lubricants should see that products are delivered promptly, maximum cleanliness is maintained, and accurate records kept. Lubricants should be issued only on requisition or order. Excessive quantities should never be issued. Return of unused oils or greases is risky, for contamination may have occurred, especially if the workers are careless or if open containers are used.



Time may be lost while waiting for an oil can to fill. Overflow under such conditions will of course, be probable, and when it does occur, the floor will become sloppy and the fire hazard increased

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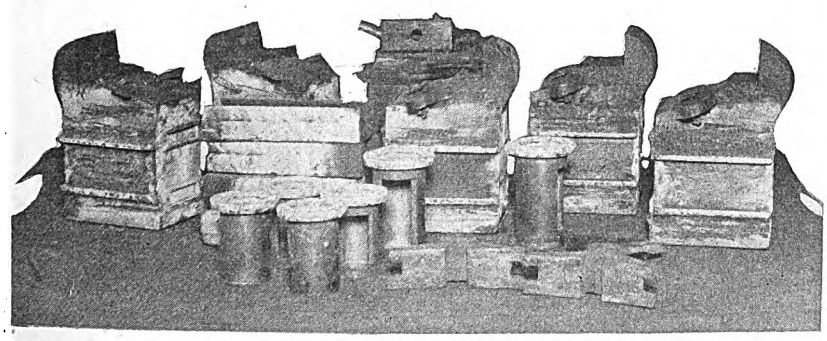
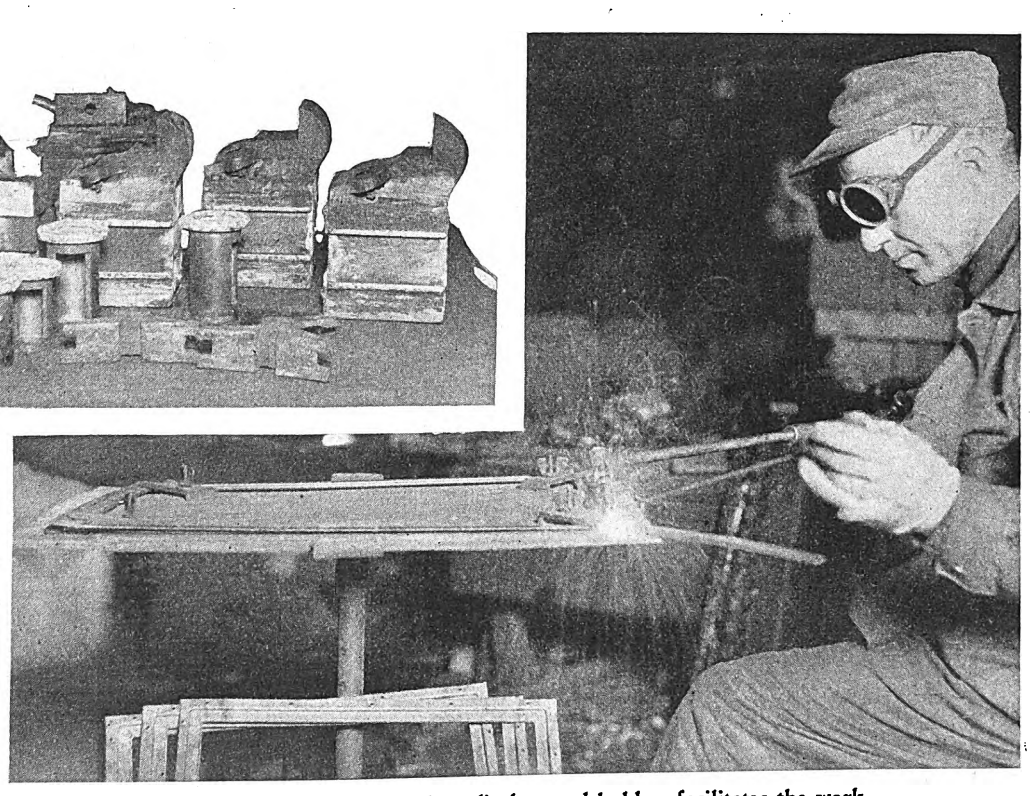
Acetylene Welding
Cuts Maintenance Corners

The process aids in maintaining the entire system from track to trolley and from power plant to shop. Repairs are speeded and large stocks of repair parts are made unnecessary

By W. I. Gaston
The Linde Air Products Company, New York, N. Y.



Armature bearings, worn sections of brakeshoe heads and the pedestal guides on journal boxes form an economical field for building up with bronze by acetylene welding



A revolving table used in welding display card holders facilitates the work

METHODS for maintenance must be chosen carefully in order to secure maximum economy in the operation of an electric railway system, large or small. Each problem that arises in connection with any part of the system probably has one answer that is the best, most efficient and most economical. That solution often may be some form of the oxy-acetylene process of welding and cutting.

In repairing track joints, use of a cutting blowpipe saves time. Rails can be cut and rusty track bolts removed in a fraction of the time required with a saw or chisel. For such jobs as cutting up old rails and laying them as guard rails, acetylene cutting is speedier, and therefore cheaper, than any other method.

For welding the bond terminals to the rails to obtain electrical connections that will permanently retain their high conductivity, no other method has given such satisfactory results as welding. The explanation is simple—other joints are at best contact joints, while the welded joint is a fused connection.

For rapid and thorough overhauling of cars it is necessary either to have a complete stock of replacement parts on hand or to recondition old parts efficiently. When a part is removed from a car it is replaced immediately by one from the stockroom and the worn or damaged part can be repaired and returned to stock for use on the next job. Of course, parts that are not interchangeable or not available are repaired while overhauling is in progress. A great many metal fittings, such as seat frames and supports, find their way to the welding department for repair.

On some large systems trucks are taken apart by cutting all bolts and rivets with the blowpipe. Cutting of bolts might seem unnecessary, but it is a great time saver since most of the nuts are rusted tight and many of the threads would be stripped if a wrench were used. Much hard labor is avoided by the use of the cutting

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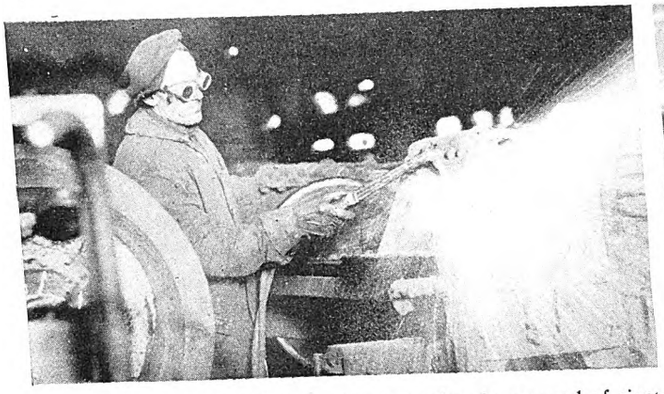
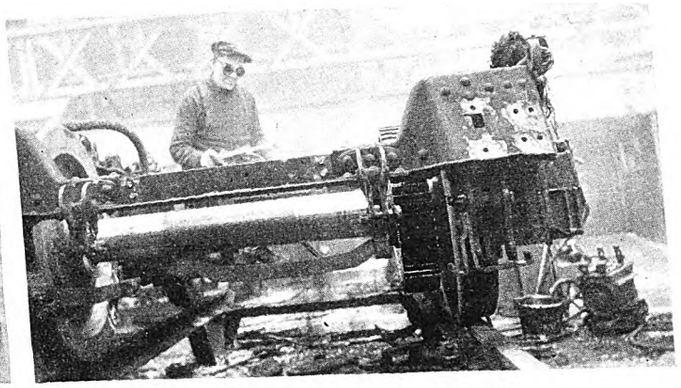
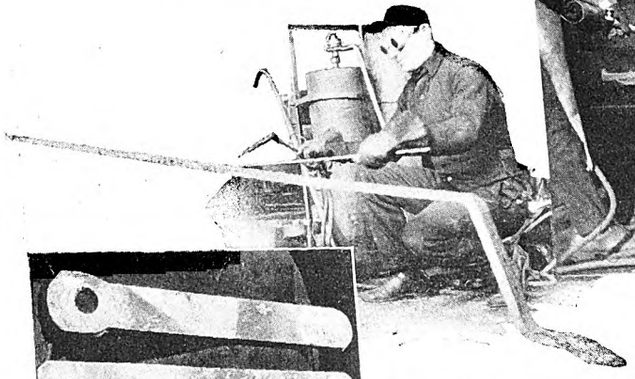


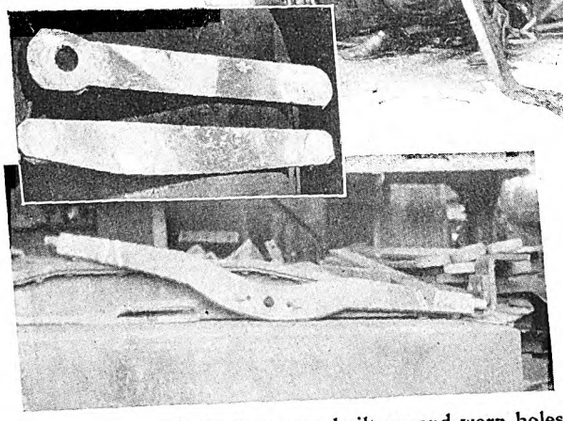


Acetylene cutting saves time in removal of rivets and bolts with nuts rusted tight in connection with dismantling of truck parts for overhauling

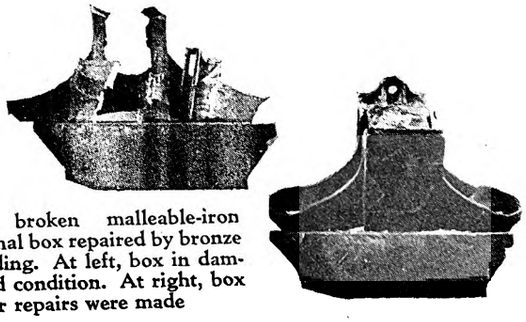
Some Cutting and Welding Work Where Maintenance Costs Are Reduced



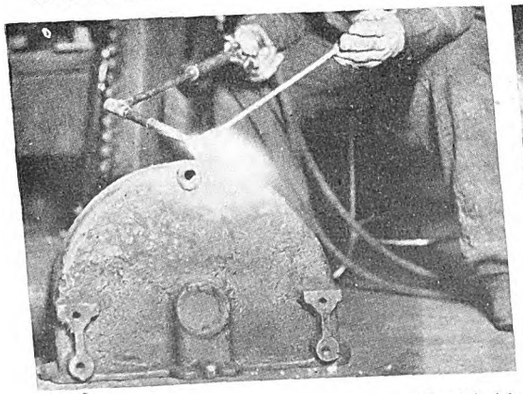
Acetylene cutting and welding save time in removal of damaged parts and in replacement of steel car body work. At left, heating a part of a bumper for straightening. At right, overhauling a body frame

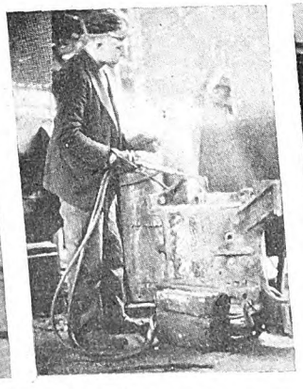


Worn parts of brake levers are built up and worn holes are filled in for redrilling. At top, building up a long lever. In center, a brake lever with holes filled in for redrilling. At bottom, worn section of brake lever filled in



Badly broken malleable-iron journal box repaired by bronze welding. At left, box in damaged condition. At right, box after repairs were made





Many large castings are cut out and welded in electric railway maintenance. At left, repairing a damaged compressor casting. In center, repairing a damaged motor sill. At right, worn coupler heads built up

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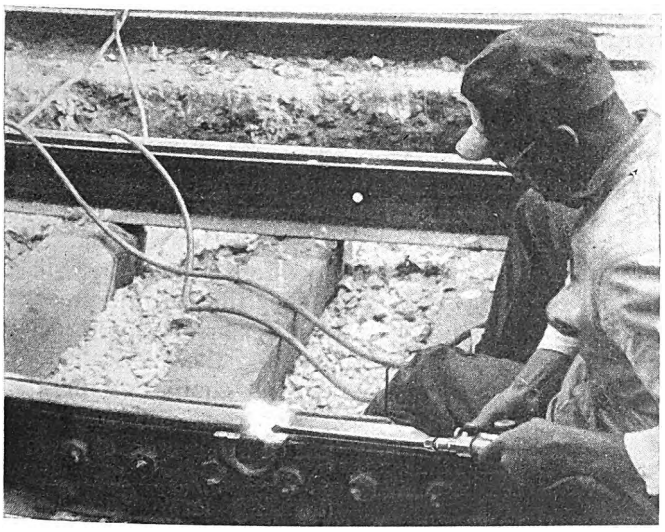
blowpipe. As each part is removed from the truck it is carefully inspected for breakage or wear. If defective in any way, the part is sent to the welding department for reclamation.

The oxy-acetylene blowpipe is used for heating in the repair of side sills and bumpers. When a sill is bent, it would cost a great deal of time and money to remove the whole plate (possibly destroying the bolt threads in doing so), then to carry the sill to a forge, heat and straighten it, put it back and repaint it. It is much easier to wheel a portable welding outfit to the car, heat the bent sill while in place, and force it back to shape with clamps or a sledge. Many bent or cracked bumpers also can be repaired in place. Welding will save a bumper from the scrap pile even if it is broken in two.

No parts under the car are subject to more wear than the brake mechanism. All levers, rods and beams must not only be connected, but they must also be supported with pins or bolts. Since everything must have a running fit it is easy to see that constant use wears the pins and elongates the holes. Levers, rods, beams and hangers are frequently worn at certain spots from continually rubbing against some other parts of the under-car structure. New pins are used to replace the old ones, but money and time are saved by filling in all elongated holes by welding and then redrilling them to correct diameter.

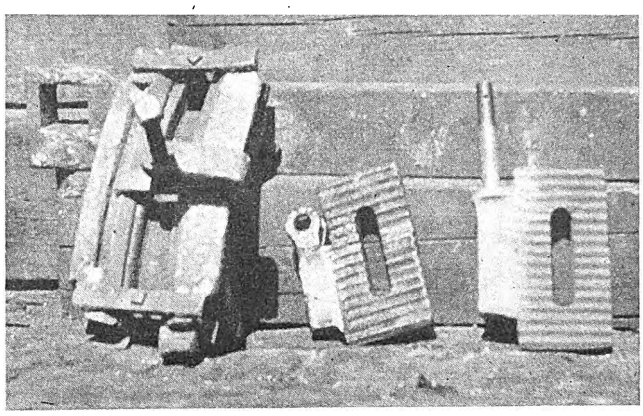


Welding a bond to a section of rail

In some types of braking mechanism a radius or circle bar transmits the force from the pull rod to the truck brake levers. As the brakeshoes and pin holes wear, the radius bar is pulled over toward the pony or idler wheels of the truck, often so far that the flanges rub and wear it almost through. This is another building-up job for the welders. Many of these radius bars are salvaged together with the other levers, rods, beams and hangers.

Repairing air compressor frames is another function of the welding department. Sometimes the side itself is broken, but more often a bearing lug has snapped off. If there is a hole in the frame a piece of plate is cut to fit, the edges of both frame and plate are chamfered, and the plate bronze-welded in. Then the weld is tested with kerosene to make sure it is absolutely tight. Or if a broken bearing lug has brought the shell to the welding shop, the piece is welded back on again. When the lug has been lost, a new piece is worked up from steel by the blacksmith and welded in place.

The dismantling of the truck continues while repairs are being made on the braking system. The motor suspension system makes use of steel bars and yokes and, as in the brake mechanism, holes that have become elongated are filled in for redrilling. Sometimes the vibration of a car throws a gearcase out of line and the gear chews a hole in it. The malleable-iron casting is then sent to the welding shop. A steel plate large enough to cover the hole is cut and bronze-welded over it. This is the simplest and probably the most satisfactory method of making this repair.



Ratchet castings for supporting shoe beams are reclaimed by welding

When rivets have been loosened by vibration, rivet holes in the side and end frames of the truck become worn. The same thing happens to the holes in gusset plates. All receive similar treatment; they are filled in by welding and then redrilled. Sometimes truck side frames break at the pedestal. It is common practice to repair them by carefully chamfering and welding the break. Then a piece of bar is forged to fit over the top of the pedestal. When it is approximately in place, it is heated with the welding blowpipe and clinched down tight on both sides. In forging the bar, the edges of the face that fit against the side frame are beveled, so that when the bar is in place there is a groove along its joint with the frame. This is used as a V and the point welded. The frame, because of the reinforcement, is then stronger than it was originally.

Worn and broken parts of seat castings can be easily reclaimed

When it is necessary to scrap a car wheel the axle is often worth salvaging. Sometimes, however, the wheel is shrunk on so tightly that it cannot be removed in the wheel press. Such wheels are cut off with the blowpipe. Starting at the flange the cut is worked inward toward the axle until it is possible to crack the wheel with a sledge blow.

Brush-holders pivot on pins and have springs to keep the brushes in contact with the commutators. The holes in the brush-holders,

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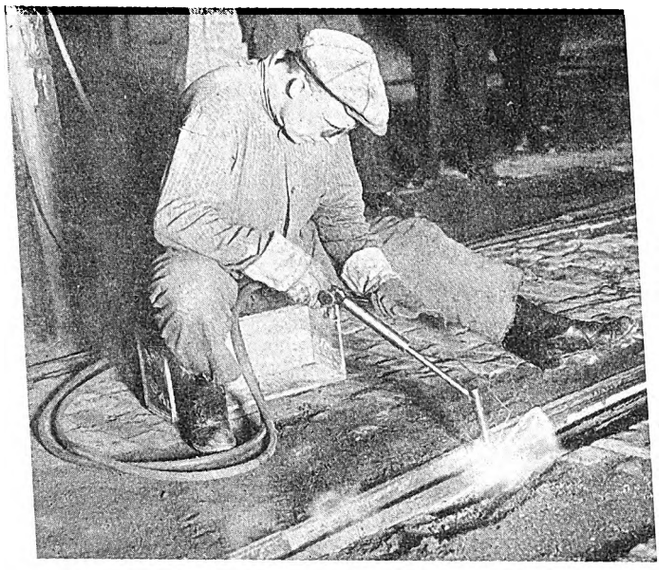


Building up worn section of track at a switch

which are brass castings, become elongated. They are easily filled up with metal from bronze welding rod and then redrilled.

In a trolley base strong springs keep the wheel against the wire. The pole oscillates continually, causing wear on the fulcrum of the trolley stand. This makes it necessary to fill in and redrill the holes through which the fulcrum pin passes. The cast-iron lugs by which the controller is bolted to the platform are often broken off and must be replaced by welding.

In subway, elevated and interurban railway maintenance many opportunities for welding similar to those already mentioned present themselves, but there are others due to the different construction of cars and trucks. Long trains have hundreds of parts not required by the single surface car, such as draft gear and third-rail shoes. A frequent repair is made on ratchet castings used to adjust shoes for collecting current from the third rail. There is a bolt fastened to each which holds it in place. On one type this bolt is attached by means of a shackle which is a part of the casting. The pin through this wears the holes which are then filled in and redrilled. Another type of ratchet casting has the bolt welded directly to it. When this bolt wears out it is a simple matter to cut it off and then weld on a new one.

Blowpipes are also useful for the repair of storage batteries used in subway cars. Old plates are taken out and new ones attached to the connectors by the familiar process of lead burning. A series of inverted U-shaped strips attached to a base form a jig to hold plates in position during welding.

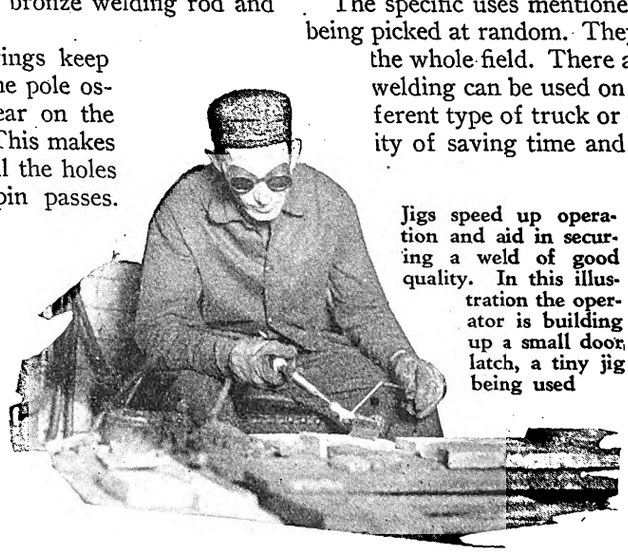
Jigs are used wherever possible to speed up the work and aid in securing welds of good quality. An accompanying illustration shows one of these. The operator is building up small door latches. This jig was made easily by welding two short pieces in 1-in. x 1-in. angle iron, heel to heel.

A table with a revolving top on which the work is clamped is another time-saving fixture. In the illustration the operator is shown welding the corners of a display card holder used on the dashboard. The four sides are cut with mitered ends from the stamped strips, then clamped in place on the table and welded. The corner clamps, which are held to the jig by wing nuts, have their outer ends cut in V shape so that one prong of the V rests on each side of the corner. The weld can be made between them. This is a production job that is frequently encountered in street railway shops.

One street railway operating several hundred cars had a need for special brackets to reduce motor vibration. These were made by welding a 1-in. bolt about 1 in. long to each end of 2-in. channels 2 ft. long.

Certain kinds of fabrication occasionally are done in some shops. As a general rule the engineering departments of good-sized systems are continually experimenting, changing designs and trying out new ones. For fabricating miscellaneous new equipment, or changing over old equipment to conform to new designs, the blowpipe is useful. One alteration job consisted in cutting away a part of each axle cap to make provision for a new oiling system.

The specific uses mentioned are merely representative, being picked at random. They do not by any means cover the whole field. There are hundreds of places where welding can be used on electric railways. Each different type of truck or car offers some new possibility of saving time and money through the process. The repair of shop machinery and the fabrication of special equipment in the power plant and shop need not be dwelt upon at length. Typical applications include mending large and small castings, restoring worn or broken forgings, fabricating steam lines and even constructing small metal frame buildings. When any part fails to function properly or it is considered desirable to modernize a piece of equipment, welding furnishes an easy method of making permanent changes at small cost. There is always room for developing new uses of this sort for the process.



Jigs speed up operation and aid in securing a weld of good quality. In this illustration the operator is building up a small door latch, a tiny jig being used

Boston's Maintenance Code

ELEVEN principles which are fundamental to the success of the maintenance department and may be considered as essentials of success generally have been laid down by H. M. Steward, superintendent of maintenance of the Boston Elevated Railway. These were printed in handy form on a 2x6-in. card for distribution in connection with an address given by Mr. Steward.

The principles are as follows:

1. Do work well—100 per cent if possible.
2. Do it on time.
3. Teamwork and co-operation will accomplish much.
4. Be efficient.
5. Be loyal to the department and the railway.
6. Learn to obey orders so that you may give orders.
7. Do not be wasteful of material—or time.
8. Think.
9. Be sure you are right and then go ahead.
10. Treat others as you want to be treated.
11. You do not know what you can do until you have to do it.

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Watch the Condition of Your Varnish in Dipping and Baking

By John W. Jackson
Vice-President and General Manager
John C. Dolph Company, Newark, N. J.

To apply tape or string band coat with oil-proof enamel and while still wet wind with cotton tape, painting as it is wound. Wind cord even over the painted tape and then cover cord and ends of commutator bars with another coat of oil-proof enamel

"I WONDER what is the matter with that paint!" These are the words which too frequently come from the many electric railway users of insulating varnish. Reduced to its simplest terms, the problem in many shops consists in deciding upon the proper varnish, knowing and using the correct type of solvent, having specific information relative to the working gravity of the varnish and last but not least giving attention to the preliminary treatment of the objects to be impregnated. Many of the troubles experienced and the wrong methods used are the result of unfamiliarity with the properties of insulating varnish. "Know the Other Man's Job Too" was the caption given a recent article by one of the editors of *Industrial Engineering*. This reasoning is particularly applicable to the problems of insulating varnishes.

Great care may be exercised in the selection of a varnish, only to find later that the results are not as expected. The reasons for failure may be due to more than one factor. I will endeavor to discuss measures of omission rather than those of commission.

In many shops too little attention is paid to preliminaries. The cotton covering of wire, cotton tape and fibrous materials which go into the construction of coils absorb moisture readily, often up to 10 per cent of their weight. Many times this moisture is not driven out before the varnish is applied. It can be done only by subjecting the coils to prebaking at a temperature above the boiling point of water, or at 212 deg. F.

DON'T *try to reinsulate or dip a used armature in varnish until the dirt has been blown off and the oil removed by a benzine moistened rag.*

DON'T *use varnish that is too heavy.*

DON'T *use varnish too thin.*

DON'T *thin varnish near an open flame.*

DON'T *fail to check up gravity of varnish before dipping coils.*

DON'T *try to mix benzine and varnish unless both are at about the same temperature.*

DON'T *expect a varnish to keep itself clean and free from dirt and lint from the coils. Take it out of the tank and filter it occasionally through four to six thicknesses of cheese cloth. At the same time clean out the accumulation of muck and dirt in the tank.*

DON'T *guess at the amount of benzine that may be needed to bring a heavy varnish to the right dipping consistency. Use a thermo-hydrometer and solvent chart and be sure.*

DON'T *try to establish the right dipping consistency of a varnish with a stick or stirring rod. Use a thermo-hydrometer.*

DON'T *fail to provide a close fitting cover for your varnish tank and see that the cover is down when the varnish is not being used. This precaution will save time and trouble and prevent undue evaporation of the volatile benzine solvent.*

DON'T *fail to provide a thermometer for the oven. With this the temperature may be controlled and it will prevent burning up the coils or underbaking the varnish.*

DON'T *neglect to ventilate the oven properly. See that openings are provided at the bottom for the access of fresh air, and openings at the top to carry off fumes driven off the varnish during the baking.*

DON'T *pull an armature from the varnish too quickly. Give it a chance to absorb the varnish and then pull it out slowly, and thus secure a uniform coating.*

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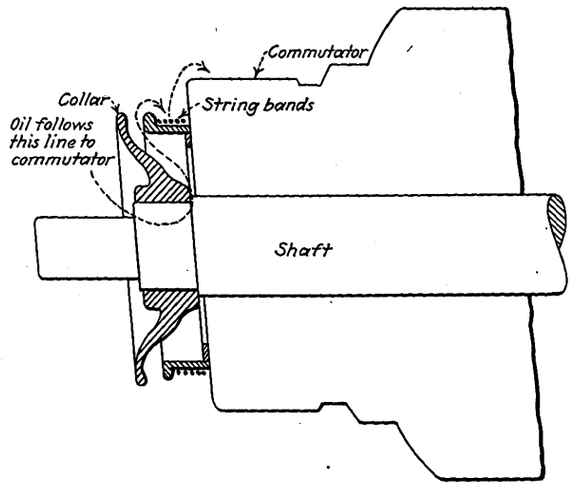
Prebaking is of value in other ways. The copper becomes heated uniformly expanding the air in the coil and the varnish penetrates quickly to the inner layers of the windings when the coil is immersed in it. It has also been found that prebaking shortens the regular baking period. The heat stored in the coil tends to assist in the quick expulsion of the solvent.

All varnishes should be maintained at a certain gravity. Gravity is governed by the type of base and the type and amount of solvent. High gravity solvents evaporate quickly, causing the varnish film to set too soon. The heavy coal-tar derivatives, while having high solvent properties, take too long to evaporate from the coil windings.

Solvents or Thinners Should Be Given Thought

The nature of many varnishes on the market make it necessary to use benzol as a thinner. As they become heavy and reach the "go-back," or livered, stage the benzol solvents will bring them back to a usable condition. The light petroleum distillates have little solvent effect on varnishes of this character. Many men have found too late that after the so-called thinning of their varnish they have nothing but colored gasoline in their windings. The benzol types of thinner should never be used in any baking varnish. All these types of solvents present an extreme fire hazard, the flashpoint being below freezing. They will positively attack enameled wire. In addition it has been demonstrated that they are injurious to the workmen.

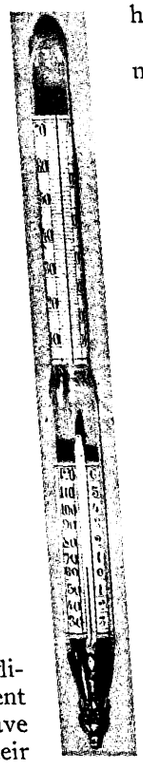


Path of oil seepage to string band and commutator

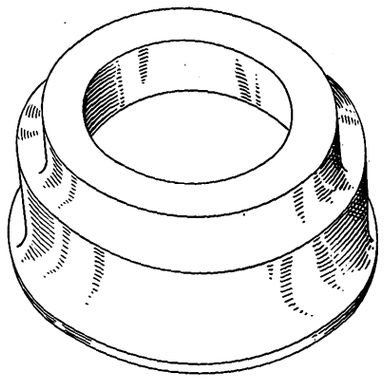
It is surprising to know how many men who are responsible, rely on the old stirring stick when determining the amount of solvent necessary to bring the varnish to its proper gravity. The temperature of the varnish at the time of its thinning should be known definitely. Temperature and gravity should go hand in hand. How many times have you seen men pouring in solvents and watching the flow of the varnish from the stirring rod as an indication that enough solvent has been introduced? Some men who are fortunate enough to have a hydrometer really exercise care in taking the gravity of the varnish but pay no attention to temperatures. Then again others take into consideration that it is necessary not only to take the gravity but are equipped with a hydrometer and a thermometer. Even with both of these it is surprising how much time can be wasted before the necessary amount of solvent is poured into the varnish to reduce it to its proper working gravity. Our company, several years ago, saw that much time could be saved by working out a solvent chart which would indicate the number of gallons of solvent to be added to every 100 gal. of varnish in order to reach the desired specific gravity. A copy of this is reproduced here.

The varnish and the solvent should be at about the same temperature before endeavoring to introduce the lighter gravity solvent into the heavier-bodied varnish. The solvent should be added slowly while stirring vigorously until it is taken up entirely. Addition of large quantities of cold solvent will curdle the varnish, which renders it practically unfit for use. The best time to reduce the varnish is at the end of the day. It is then warm as the result of the continual dipping of hot coils, armatures and fields.

Periodical straining or filtering of the varnish is always advisable. No matter how carefully they are cleaned continual immersing of machines is bound to leave a certain amount of dirt in the varnish.



Use of the thermohydrometer (shown at left) eliminates guess work regarding proper consistency for dipping varnishes



The inside of oil collar should be smooth and free from fine grooves

In the opinion of the writer, next in importance comes the type of slot insulation. It should afford not only dielectric strength but mechanical protection as well. Many shops use untreated wooden wedges together with varied types and construction of slot insulation. Using these materials with no preliminary treatment, very little varnish gets down into and fills the slot. After repeated coats of varnish have been applied and baked in, it is obvious that no oil, dirt, moisture or any other foreign matter can reach the coils provided the varnish is absolutely oilproof.

Whether or not a varnish should be oilproof is causing a great deal of discussion today. In this connection our company through its representatives in the field has endeavored to get expressions from the men in the shops as to why motors go down and the causes for such failures in the order of frequency. Naturally first on the list is bearing trouble. Second is commutator trouble on d.c. motors. Third is lubricating oil which finds its way into the windings.

Lubricating oils, by carbonizing windings, cause breakdowns, particularly in compressor motors with splash lubrication using a light oil. Bursting bubbles throw a fine spray of oil into the air; the motor ventilating itself

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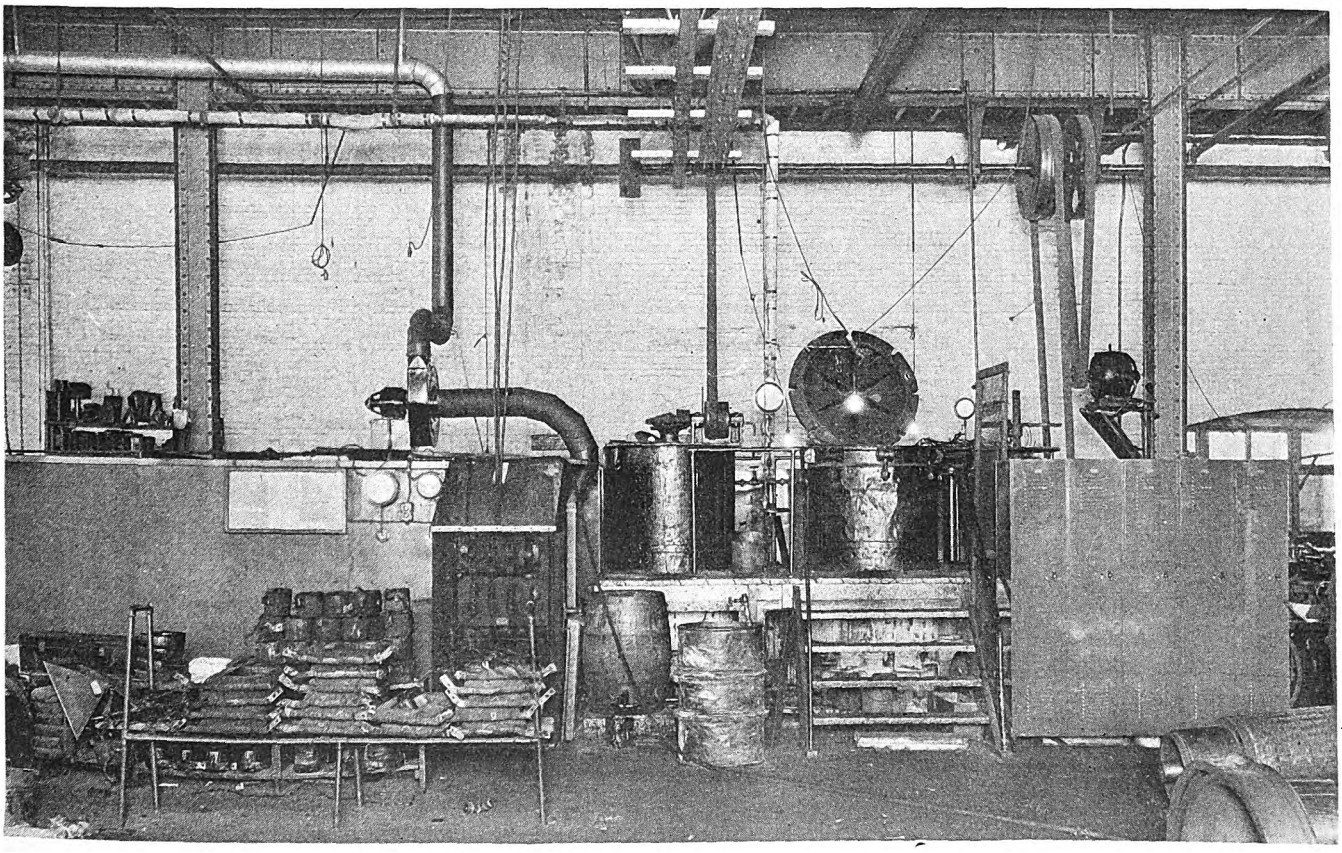
draws this air against the windings. A chemical reaction takes place. The necessary agents for changing oil into carbon and water are present in the motor; they are the copper in the coils, heat from the windings, oil from the bearings, oxygen and ozone from the air. Coupled with heat, the oxygen and the oil, the copper in the coils acts as a catalyzer, breaking up the oil into carbon and water. The water evaporates while the carbon remains in fine particles on the insulation. Additional oil finds its way continually into the windings and if the insulating varnish is not immune it is only a question of time before the oil disintegrates the varnish film and carries the carbon and dust down into the coil windings.

The cleaning of motor windings should receive more attention. It will not only increase the life of the motor but also benefit the impregnating varnish. The cleaner the motor the less dirt and grease find their way into the varnish. Gasoline, benzine and carbon tetrachloride for the windings and alcohol for the commutators seem to have first call as cleaning fluids. Frequent, systematic and thorough inspection of all equipment as part of the routine should be the standard under which every shop management desires to operate.



Carefully arranged dipping tanks and drying ovens will do much to insure satisfaction with insulating varnishes

Control of Oil Seepage from Bearings to Commutator

Oil seepage may be laid to the heat generated and to end play in the armature. Secondary reasons are, first, wearing of grooves in the collar and on the shaft; second, improper removal of the collar, and third, improper fitting of the original collar, causing the first grooves to occur on shaft and collar.

A collar to be placed properly should be heated to approximately 300 deg. F., and placed with a press fit. It should have an inside diameter about 0.004 in. smaller than the shaft. In using this method there is no drag on the shaft and the collar is placed easily and properly.

If there is seepage to the commutator the collar should be removed in the following manner: A gas ring made of ordinary 1-in. pipe with a slightly larger circumference than the collar, should be placed over it and heat applied for an average of seventeen seconds. With a clamp placed securely about the collar, approximately 1 to 1.5 tons hydraulic pressure will remove it. The collar and shaft can then be examined for grooves. These usually are very fine, but with the end play on the shaft they are sufficient to act as a pump, carrying the oil from the bearings under the collar, on the string bands and finally the deposit of carbon particles, dirt and oil cause a short circuit and burning out of the motor. The collar should be built up by welding and the inside surface made free of grooves. The shaft should also be free of grooves after which the collar may be replaced. This method of placing and removal of the collar aids considerably in overcoming the flow of oil from the bearings to the commutator.

"How Much Does it Cost to Insulate?"

Many insulating varnishes today are bought not because of the protection they give but on account of their price. Such varnishes, no matter how cheap, are costing their purchaser many times their price. Cost records disclose that the cost of insulating varnish used is only a small fraction of the total cost of the rewinding.

Great strides have been made the last few years in an endeavor to overcome bearing troubles. There are still hundreds of motors operating which cause their owners more or less trouble from oil, consequently those motors should be dipped and baked in an insulating varnish which is absolutely immune to oil. Resistance to oil can

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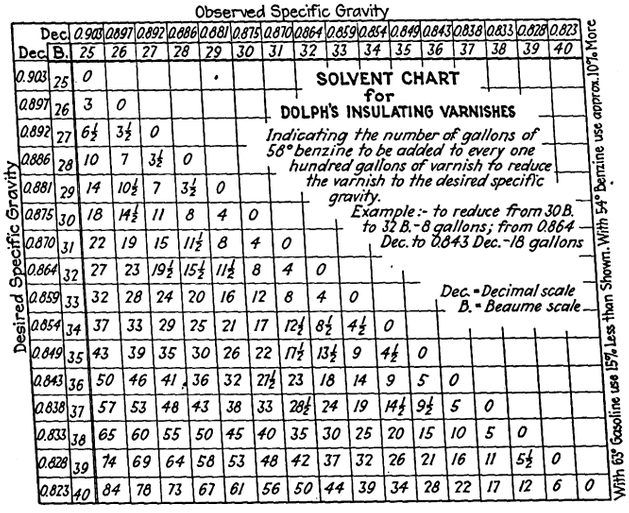
be obtained only when the coils are baked properly and sealed perfectly with the proper insulating varnish. If two or three dips are necessary to provide the proper seal the time and the small amount of varnish used will more than compensate for the additional trouble by prolonging the life of the machine. Many men, I find, are resorting to several additional coats of a spirit finishing varnish, which in addition to giving protection against oil, dries with a hard, smooth finish. Such a surface will prevent dust particles from adhering or cutting into the insulation. This type of varnish is an insulator only when thoroughly dry, so that if ground tests are made this point should not be overlooked.

Few armature repairmen appreciate the value of an



Solvent chart showing thinner needed for an insulating varnish

oilproof insulating enamel for tape bands and string bands in the V at the end of the commutator. An oil-resisting insulation makes it easy to keep the bands clean and protects the exposed ends of commutators so that many motor troubles disappear. For this purpose there are oilproof enamels available. After the commutator has been turned down and the mica cone is ready for banding a coating of oil-proof enamel, followed while still wet with cotton tape the full width of the mica, can be put on, painting the tape as it is wound in place. Cord wound evenly over the painted tape, pulled taut, fastened securely in place and covered with enamel, will provide a waterproof insulation.

Correct Baking Necessary

The dielectric strength of a varnish depends in a large measure on its correct baking. This requires economical heat distribution and a ventilating system to give proper air circulation. With poor ventilation it is not to be wondered at that baking for a period of from twelve to 72 hours is needed. Not a few persons consider an iron box large enough to accommodate several motors good enough for a baking oven. They introduce enough of heating units to give temperatures from 200 to 250 deg. F. and then arrange a lid or door so that the oven is almost hermetically sealed. Proper drying requires that the solvents which have been driven from the varnish should be carried off. These vapors not only retard the drying but are a fire hazard and sometimes have caused explosions. In any oven a large part of the heat is absorbed by the metal parts of the interior before the oven is brought up to its correct temperature. Unless the metal frame is protected with some good heat insulating material the cost of operating the oven will be high. Too much air circulation retards baking, so the mere placing of openings in an oven for the inlet and outlet of air does not constitute a real ventilating system. The openings should be proportioned and located to provide for the proper air circulation.

New Automatic Power Plant in Operation

WITH the completion of the new automatic power plant at Alouette the British Columbia Electric Railway will add 12,500 hp. to its hydro-electric system on the lower mainland of British Columbia. This new power source cost approximately $2,500,000.

The new power plant is located about 25 miles due east of Vancouver. The nearest point on either roadway or railway was Haney, and the first work to be undertaken by the company after deciding to develop the water power of Alouette Lakes was to establish the necessary transportation communication.

A tunnel has been driven from Alouette Lakes to the Stave River and a dam built to raise the level of the lakes to permit the necessary diversion, and to increase the storage capacity. The new plant will supply power to the lower mainland of British Columbia and is an indication of the confidence which the British Columbia Electric Railway has in the future of this province.

New Color Scheme for Baltimore Cars

FOR NEARLY a year the United Railways & Electric Company of Baltimore, Md., has been operating cars of various colors and color combinations with the idea of learning which colors stand up best and at the same time are most popular with the public. Residents of the city were requested to make suggestions and hundreds of letters were received.

The color scheme, which was adopted for rear entrance cars, is one of the most popular with the people and also has proved to be one that will best withstand the elements. The body of the car is a dark red, the trimming around the windows is cream and the roof is buff.

Since the test was started there have been many letters received urging the company to adopt various shades, one of the earlier leaders being solid green. Careful check, however, showed that this color did not meet the test and after the cars painted this hue were in use for a few months it was found that they appeared to be soiled. For this reason the company decided that another color would be better.

A great many persons favored the combination that has been adopted and when the tests showed that this stood up as well as any of the others and better than most, the officials decided that it should be the combination for all the rear-entrance cars.

Bright red and blue met with considerable favor on the part of the public but in announcing the official action of the company, Raymond S. Tompkins, assistant to the president, said it was found that both of these colors faded. The company will have the new combination of colors used on all the cars to be painted as quickly as possible.

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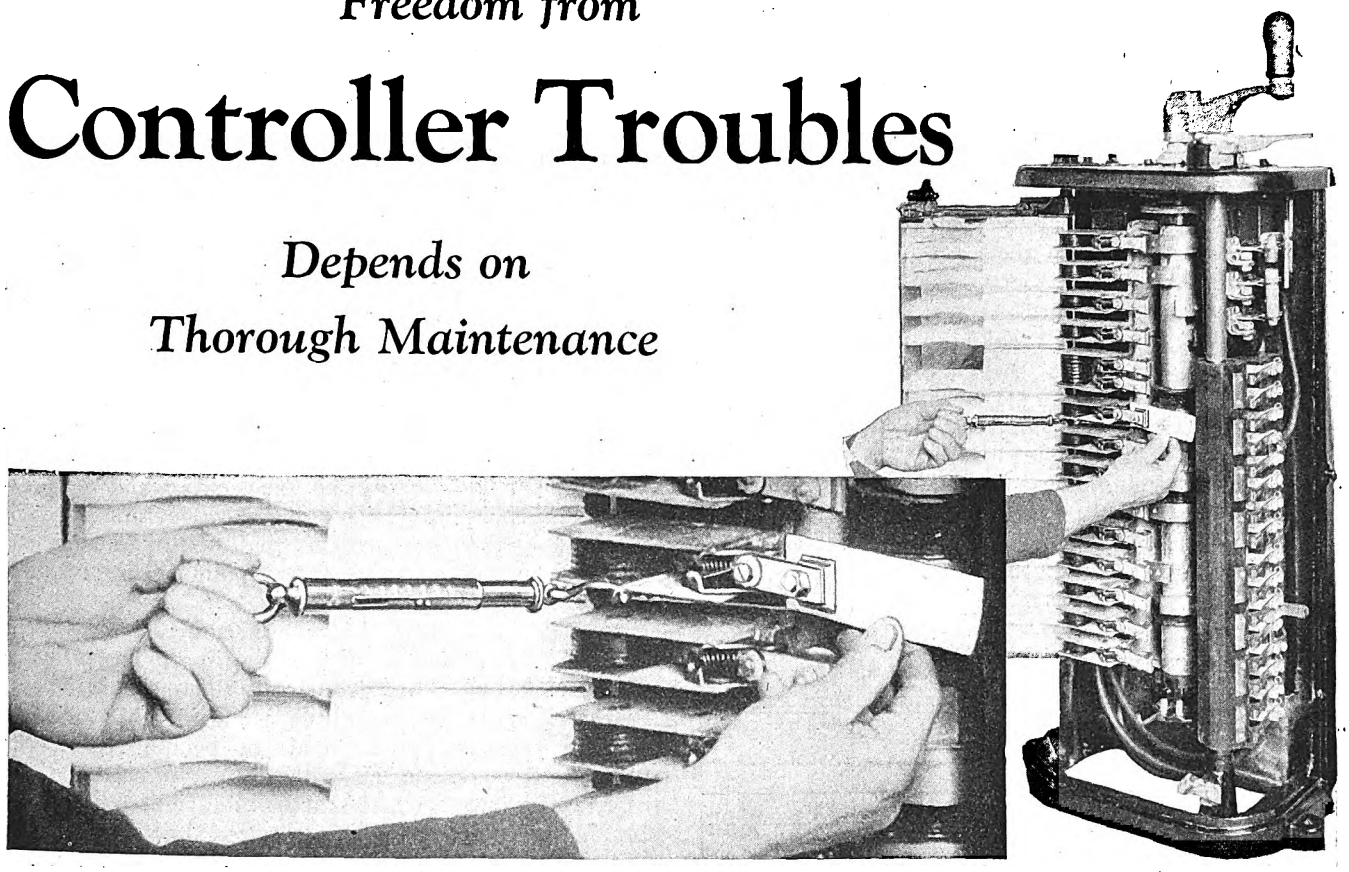
Freedom from
Controller Troubles
Depends on Thorough Maintenance



Contact pressure is measured best with a spring balance and a wire loop. Pulling on a strip of paper between the contacts indicates when the pressure is to be read

Correct pressure adjustment of contact fingers prevents arcing and reduces wear. Records of failures assist in maintenance. Too much lubricant is as bad as too little

By R. S. Beers
Railway Engineering Department General Electric Company

MAINTENANCE of control equipment on street cars is one of the important factors in their successful operation. It seems impossible to put a finger on any one method of maintaining apparatus and say this is "it." Differences in climate, conditions of operation, etc., are the determining factors. Only one type of maintenance has proved unsuccessful wherever tried. It is "deferred" maintenance. In electric railway control devices, dust, dirt, carbon and metal particles are the things that cause trouble, and it really settles down to a question of cleanliness as the price one pays for freedom from trouble.

The best practices are found on properties where overhaul of the equipment is on a mileage basis. At the overhaul periods it is dismantled completely, all parts cleaned and any that would wear out before the next overhauling are replaced. When reassembled the apparatus is tested thoroughly and goes back on the road with the same factor of safety it had when originally put in service. Pull-ins for equipment failures are then very infrequent. The cost for this method is less than on some companies that never overhaul their equipment and only replace parts when they fail in service or are found completely worn out at regular inspection.

Records may appear a nuisance instead of a help, but when made simple, they serve a purpose that nothing else does. If only one record is kept it should be a pull-in record, showing the miles operated for each pull-in on account of equipment failures. When this is plotted on a graph and circulated about the property a desire to increase the miles per pull-in can be built up. That will point out the desirability of further records, which in turn will make possible an intelligent survey of troubles experienced and also give data for their analysis and correction. In addition they will give reliable information about the life of equipment and renewal parts that may be used by the storekeeper to keep on hand adequate stocks of renewal parts and raw materials.

With the modern K-type controller, inspection should consist of occasional oiling of the bearings; trying the

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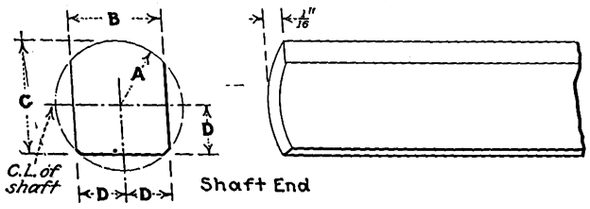
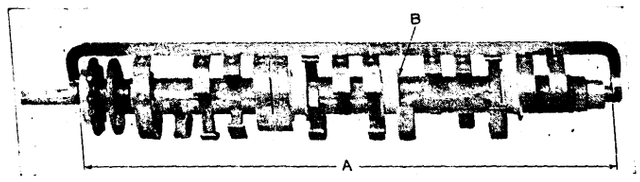
star wheel and drum castings for tightness; replacing worn parts such as star wheel pawls, pins, fingers, segments and arcing plates; examining the cutout switch for contact, making sure the proper mechanical interlocking between main and reverse drums is present; trying contact pressure of the reverse fingers; adjusting the drop of the main fingers; filing roughened segments, and replacing worn-out segments and burning tips.

The two essentials for the successful and economical operation of controller fingers and segments are lubrication and contact pressure. Without the former both finger and segment wear rapidly and the motorman complains that the controller turns hard. The best lubricant is a high flash point oil or grease. For ordinary temperatures a grease of about the consistency of vaseline gives the best results. The tendency is to use a generous amount of lubricant because too little makes itself evident by roughened fingers and segments. When too much is used a part of it falls on the surrounding insulation and collects dirt and copper dust with a tendency toward insulation failures. The best practice is to spread a liberal amount of lubricant over the segment, turn the controller drum back and forth several times, and wipe around the fingers and the segments to remove any surplus.



Part	For Shaft Diam.	A	B	C	D
7	7/8"	0.4375" +0.000" −0.0015"	0.6875" +0.000" −0.002"	0.78125" +0.000" −0.0025"	0.34375" +0.000" −0.001"
8	1"	0.500" +0.000" −0.0015"	0.759" +0.000" −0.002"	0.8795" +0.000" −0.0025"	0.3795" +0.000" −0.001"

Correct broached dimensions for 7/8-in. and 1-in. controller shafts



Template for locating body castings on controller cylinder

Correct Adjustment of Contact Pressure Is Important

Adjustment of the main fingers is next to lubrication in importance. Usually they all should leave the segments at the same time when turning to the off position from the first notch. This is particularly necessary with the older types of controllers, such as the K-6, K-10 and K-28, where the factor of safety is none too large when rupturing the arcs with the present-day voltages to which they are subjected. After this adjustment the inspector turns the controller to the on position and judges whether the drop of the finger is enough to give good contact on all notches and not sufficient to cause it to stub. The above factors determine the proper amount of drop, which will vary from 3/32 in. to 1/4 in. With new controllers 1/8 in. or less is sufficient, while with worm segments and worn controller bearings the higher value may be necessary. Too much drop makes the controller turn hard, wears the fingers and segments rapidly and, most important of all with flat spring fingers, gives a shock to the finger spring when it strikes a segment that often reduces its life to less than that of the contact tip. A broken finger spring usually means a pull-in.

With the hinged and self-aligning types of controller fingers, where pressure is applied to the contact by means of a compression type coil spring, this difficulty is removed and the operator has more latitude in the adjustment of the fingers. On the other hand, if the fingers are given too little drop there is insufficient pressure, with poor contact between finger tip and segment with the possibility of an arc which not only destroys the finger and segment, but sometimes causes a controller blow-up. It is obvious that, as controller bearings wear, the cylinder does not rotate in an exact circle, and the pressure at the point of contact of the finger and segment varies. It is then necessary to give the fingers sufficient drop to insure good contact at all points in the rotation of the controller drum.

Pressure between the finger and segment is dependent on the shape and size of the finger spring. The pressure of the main fingers on drum controllers should be not less than 4 nor more than 8 lb. A considerable variation in finger pressure can be made by bending the finger spring to a new shape. Usually an inspector can tell by the feel of a finger whether it has the right pressure or not. When measurements are desired they can be made with a small spring balance and a wire loop or stirrup.

Sand Blast Is Satisfactory Cleaner

When overhauling a drum controller it is best to remove it from the car and dismantle it so that the various parts may be examined and repaired. The most important thing in overhauling a drum controller is to clean it. The quickest, easiest and cheapest way of cleaning the insulating parts of the controller such as the arc deflectors, main and reverse finger blocks, and the controller drum is to use a sand blast. A number of satisfactory sand blasts are on the market and it is possible for an operator to make a simple one himself. Wherever air is available, no method can equal the sand blast for cleaning controllers and putting them in good shape. In addition, if the brass and copper parts are dipped in a cleaning bath they will have a much better appearance. After the wood parts have been cleaned, they should be given one or two coats of insulating paint or varnish. The smoke, soot, and dirt which collect in the controller are readily seen on a clear or red varnished surface and wiped off, while on a black surface they remain undetected. The deflector parts on which the arc strikes should not be painted with any kind of varnish. In a number of instances operators have had trouble from this source. When heated paint and varnish give off a gas that burns easily.

The bearings for both main and reverse drums should be examined and when badly worn should be rebushed. The broached end of the main drum where the handle fits should be measured. If badly worn it should have a sleeve put on or else be built up and remachined. Dimensions for 7/8-in. and 1-in. shafts are given in an accompanying diagram. When manufacturing controller cylinders the broached end is made first and the star wheel and drilling of the segment screw holes located from it. By reversing this process the proper location for machining the rebuilt shaft may be determined.

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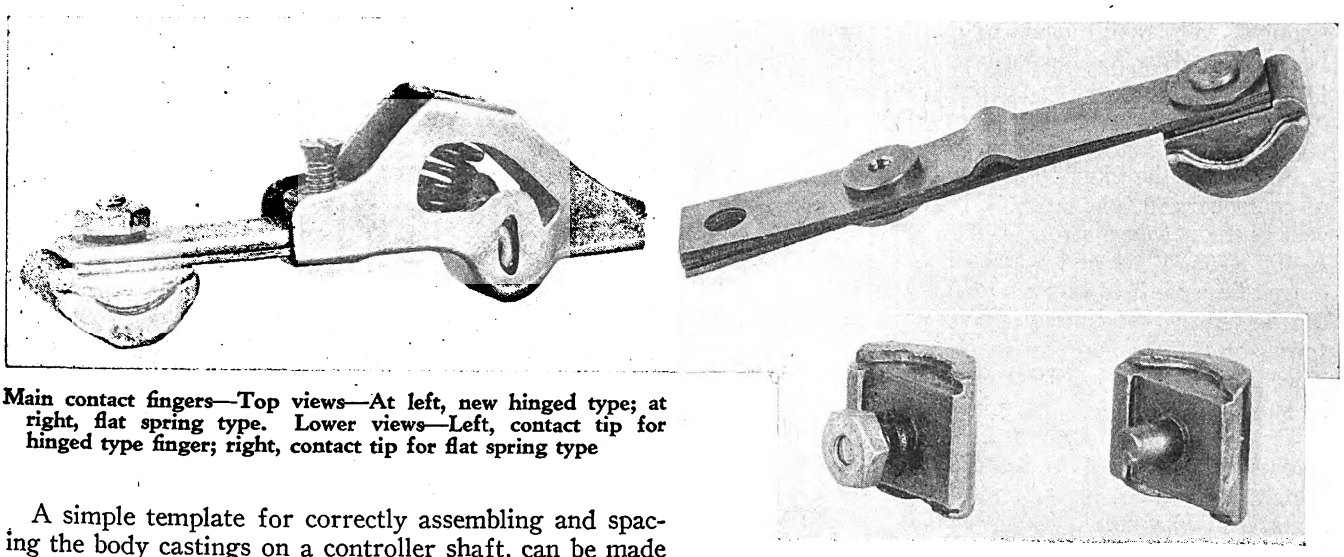


Main contact fingers—Top views—At left, new hinged type; at right, flat spring type. Lower views—Left, contact tip for hinged type finger; right, contact tip for flat spring type

A simple template for correctly assembling and spacing the body castings on a controller shaft, can be made easily so that the cylinder may be installed in a controller and turn freely. The space shown as *A* is the distance between the bearings in the controller frame and cap plate. The white lines that register with the segment screws locate the body castings so that the fingers line up with the segments when the drum is put in a controller.

When a controller cylinder is dismantled small felt washers are found separating the ends of the body castings from the insulation collars or space blocks indicated by *B*. These felt washers have an important function in keeping copper dust from working into any crack between the casting and the insulation collar where it builds up a conducting path from one body casting to the next. If felt washers are not available paint, string or asbestos paper may be used to close the cracks. Until recently the controller shaft and its insulation were made in a single unit, making it obligatory to replace both when either failed. Now the insulation is formed in a separate hexagonal tube and may be placed on any shaft.

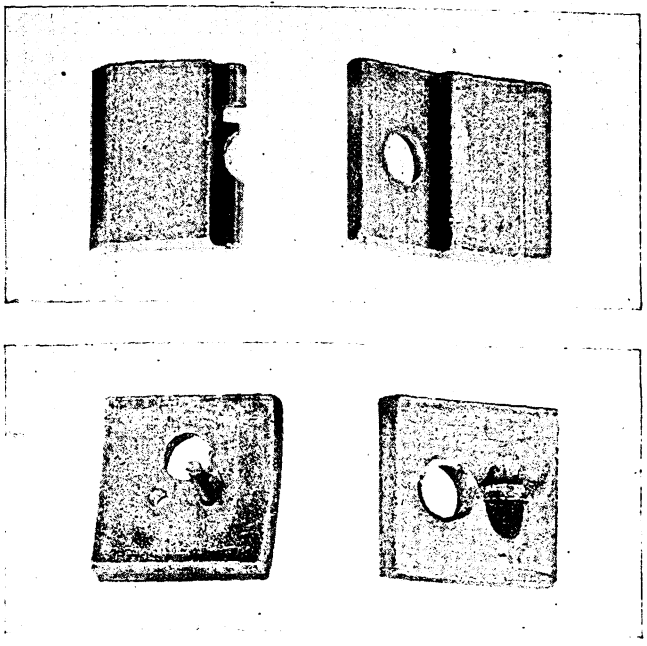
Hexagonal Shafts Prevent the Loosening of Body Castings

Early controller drums were made with a round shaft and insulation sleeves which separated the shaft from the body castings. The jars and shocks received in service often caused the parts to loosen. The only safe method of tightening loose body castings is to renew the insulation, which requires a complicated reheating fixture for each type of controller cylinder. The cure for loose body castings is a controller drum with a hexagonal shaft, a type that has been in successful use for twenty years.

There are no other changes to a controller which will reduce the likelihood of blow-ups as much as replacing steel covers with wooden ones. For years the covers for drum controllers have been made of ash wood and finished with a coat of varnish. Recently the wood was changed to cherry and the finish omitted so that the cover could be stained to match the car interior. A heavy paper shield protects the surface of the wood during shipment.

When overhauling drum controllers the wiring should be examined. If the rubber is in poor condition; that is, hard and brittle from age, or soft and mushy from grease or oil, it should be replaced. Standard cable is preferable to solid wire for this purpose. On controllers using it, the single blowout coil should be removed and treated exactly like a motor field coil; that is, tested for shorted turns, dried out in the drying oven, dipped in insulating varnish and baked.

Frequent improvements are made in the detail parts of drum controllers. Whenever a change is decided on, every effort is made to design the new part so that it may replace the old part without cutting and fitting. Users of drum controllers are furnished 1928 model repair parts for a 1910 controller. As an example let us take the K-35 controller of 1920 and today. The frame has had cable troughs added. The cap plate has been changed to include machined pads for installing an LB control device, TA handle switch or Safety Car Devices handle. The main cylinder has an insulating tube that is renewable instead of being made an integral part of the shaft. Three changes have been made in the segments: First, a better type of burning tip known as the lap type; second, a slight increase in the length of several segments that increases their life several times, and third, elimination of dowel pins in segments. The dowel pin is replaced by a copper key made an integral part of the



Burning tips—Top views—At left, new style lap type; at right, above—Old style lock type. Lower views—At left, new style with key; at right, below—Old style with dowel pin

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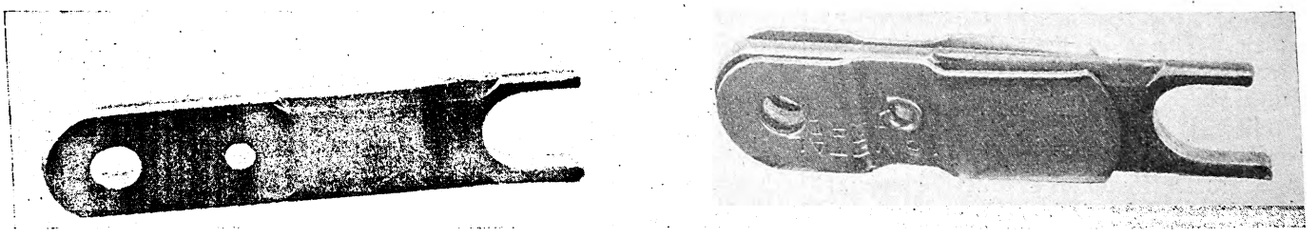
segment. The main fingers of the flat spring type have been replaced by the hinged type in which a coil spring produces pressure at the point of contact. This is the most important improvement in finger design during recent years.

Fingers of the hinged type are available for old types of controllers such as the K-8, K-10, K-12 and K-28, as well as the newer controllers like the K-35, K-36, K-39, K-40, K-63, K-64 and K-75. The contact tip on the hinged finger is held in place by a nut and a screw, while the flat spring finger has it riveted in place. The two forms of tip are interchangeable, so when tips are renewed on flat spring fingers the nut and screw type can be substituted.

The 1920 model of motor cutout was a simple knife-blade switch. Today the blade is reinforced so that the switch jaws cannot spread and overheat because of poor contact. Today, all cables are soldered to terminals and bolted in place instead of the strands being squeezed under a clamp. The line breaker or line switch has come into general use with K controllers in recent years. Its main functions are to take a large part of the arcing away from the controller fingers in normal operation, making inspection and lubrication less frequent, and to open the main circuit in an overload and protect the equipment from injury. It replaces the usual hood circuit breaker and removes from the car platform all excessive arcing.



Cutout switch blades. At left, old style; at right, new style with reinforcing

Line Breakers Need Close Attention

With line breakers, the parts requiring attention at inspection are the main contacts, all control circuit contacts, the arc chute, loose terminals and worn parts. When the contact tips are held by a single screw, a socket wrench should be used for tightening them. If they do not remain tight, new bases carrying the contact tips should be installed, as a contact tip base or support on which the tip loosens is a potential source of control failure and pull-ins. Contact tips should be replaced when worn half-way through. Roughened contacts should be filed smooth. Control circuit contacts should be cleaned and tried for pressure when closed. Arc chute parts that direct and cool the arc should be free from copper particles. When a hole is burned half-way through an arcing plate, it either should be replaced or the hole should be filled with an arc cement. To obtain successful results with arc cement it is necessary to clean the hole to be filled thoroughly.

In addition to the above, pneumatically operated line switches require that the air cylinder be lubricated, that the magnet valve be tested by air for leaks and the line switch tested for quickness and snap of action by opening and closing the line switch by means of the push pin on top of the magnet valve. Lubrication of the pin bearings of a line breaker is successful on some railways and a failure on others. Whether it is a success or failure depends on the amount and kind of dirt encountered. Often the dirt and oil mixture forms a grinding compound that wears the bearing pins and their bushings faster than when no lubricant is used.

One of the functions of the line breaker is to open the circuit on overloads. When a motor flashes over or a cable grounds and an excessive current flows, the line breaker is called upon to open the circuit and prevent serious damage. This requires that it be kept in good electrical and mechanical condition. For this reason the line breaker should be removed from the car at general overhaul or when the car goes through the paint shop, and be put in as good condition as when new. First it must be torn down and cleaned. The operating coil should be heated, dipped and baked the same as a field coil except that the drying out should last only a couple of hours and the baking not more than six hours. All worn parts, particularly pins and bushings, should be renewed. The contact tip pressure should be measured and new pressure springs installed if needed.

The contact pressure is measured with a spring balance as shown in an accompanying illustration. Pulling on the piece of paper between the tips indicates when to read the pressure. As contact tip pressure varies with each design of line breaker, the correct tip pressure for each type should be obtained from the manufacturer. Magnetically operated line breakers will perform successfully if they have a tip pressure of 7 lb. or more. On a new line breaker the pressure should be considerably more than 7 lb. because the pressure falls off as the tips wear and pins become loose in their bearings.

The overload relay should be tested and set at the correct trip point on the circuit breaker testing rack. In addition the pneumatic operated line breakers should have the piston packing examined and softened or renewed if necessary. The magnet valve stems should be measured for wear. Properly made magnet valves should operate at least three or four years before renewal of valves and valve seats is necessary.

When hood circuit breakers are used instead of line breakers for opening the circuit on overloads and other excessive currents, it is particularly important that they be kept in the best possible operating condition. Like all other control devices, they should be kept clean. Next in importance is the mechanical condition which should be such that the latch and other parts operate when needed. Then comes the arc chute which should be kept free from holes, copper dust and soot. Lastly, the contacts require enough pressure so they do not overheat.

To reduce the amount of flashing in the car when a circuit breaker opens, on some properties small houses are built over the arc chute. This is good practice provided sufficient windows are left open in the housing for the expansion of the arc.

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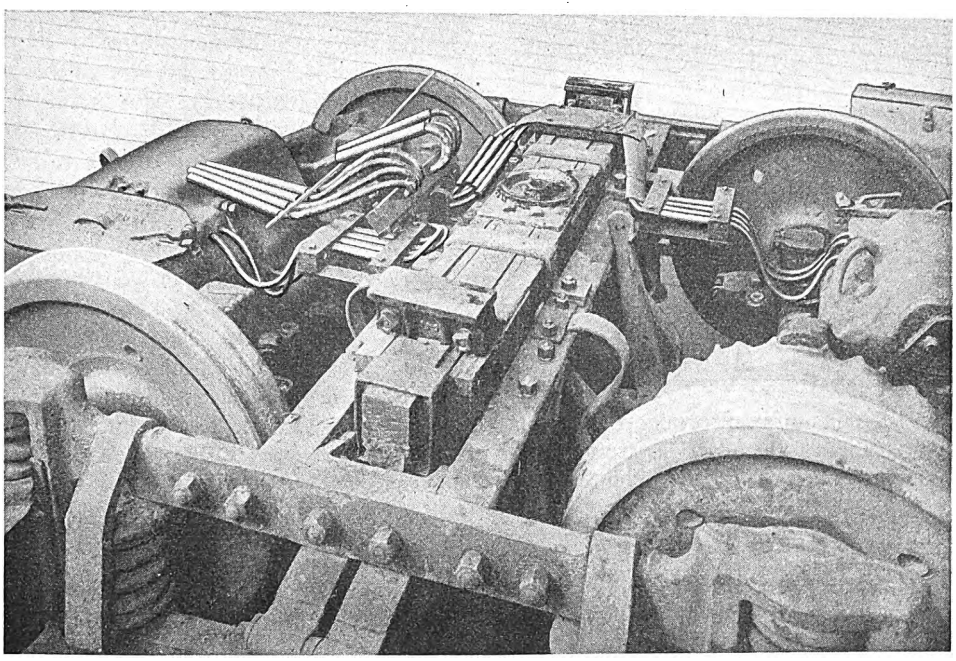


Carefully worked out system for protecting and cleating motor leads. Knuckle joint connectors are covered with hard-fiber tubing and chafing of leads is prevented by spirally wound wire armor

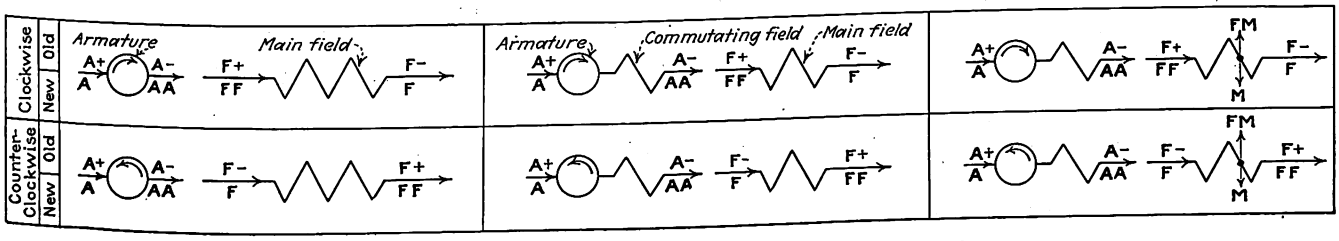
Your Motor Leads

Require Adequate Attention

By John S. Dean
Renewal Parts Engineer Westinghouse Electric & Manufacturing Company

CABLE leads on railway motors are a source of considerable trouble. Much can be done to improve their reliability in carrying the working current. First of all, the car wiring should have ample current carrying capacity and be flexible as well as mechanically strong. Thorough insulation is essential to prevent grounding. Leads should be protected where they come in contact with the motor frame and be provided with a reliable connector that can be broken quickly to simplify the disconnecting for motor repairs. Firm cleating to the motor and to the car body will reduce troubles.

Lack of uniform standard sizes and the great variety of stranding of cable for motor leads produced by the several cable manufacturers make it difficult to select an approved definite stranding and insulation of the cable. The accompanying table gives sizes which are satisfactory for different motor horsepower ratings. In listing these, the minimum size recommended by the American Electric Railway Engineering Association has been taken



Old and new markings on railway motor cable leads

At left, markings for standard non-commutating pole non-field control motors; in center, markings for standard commutating pole non-field control motors; at right, markings for standard commutating pole field control motors.

In each diagram the old markings are shown above and the new markings below the center line. The upper diagram in each group is for clockwise rotation and the lower diagram for counter-clockwise rotation. Arrows indicate current direction.

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into consideration. This table shows the sizes of cables as adopted as standard by one of the large motor manufacturers.

CAPACITY AND DIAMETER OF MOTOR LEADS

Motor Rating Hp.	Cable Size Circular Mils	Dimensions in Inches — Cable Diameter	Outside Diameter	Length of Lead Outside Motor Frame
Up to 45	29,000	0.20	0.56	4
46 to 80	52,000	0.30	0.66	5
81 to 120	83,000	0.38	0.77	5
121 to 160	110,000	0.43	0.83	6
161 to 210	142,000	0.50	0.90	6
211 to 260	180,000	0.56	1.02	6

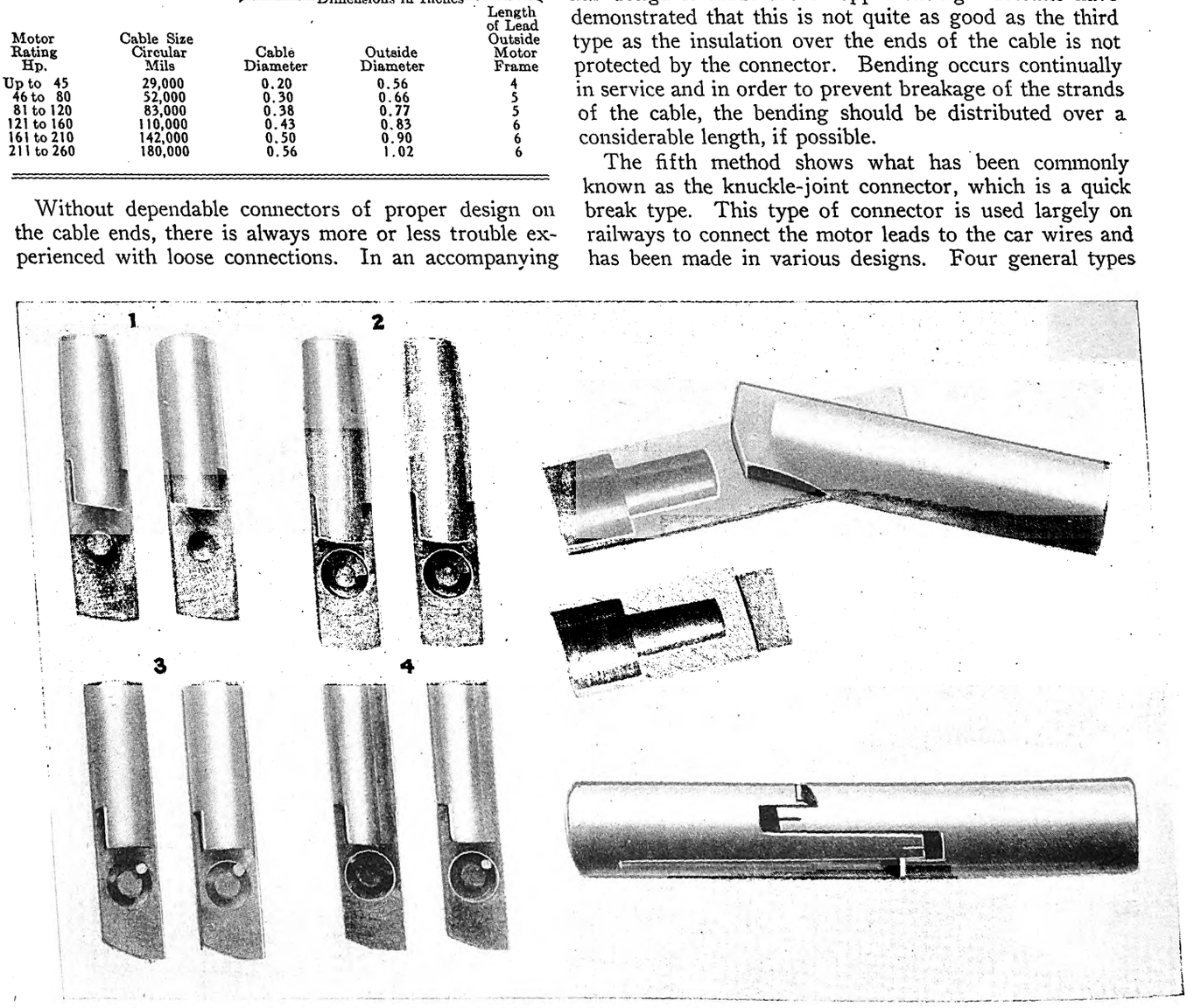
Without dependable connectors of proper design on the cable ends, there is always more or less trouble experienced with loose connections. In an accompanying illustration five methods are shown which are used to join two cable leads by connectors which can be readily separated. The first method, shown at the top, consists of the simple two-way, solid-type connector where both ends of the cable are held in place by machine screws. With this type there is always danger of leads becoming broken. Screws will loosen due to vibration and where the cable is placed in the terminal without an added sleeve, the point of contact of the screw is sure to cut the individual wires and eventually result in breakage.

The second method shows one of the leads soldered permanently into the connector. This is a slight improvement over the first method but still at one end it uses screws which are liable to loosen.

The third method illustrates what has been commonly called a screw connector. Each lead is soldered into an end of the two separate elements of the connector, which in turn are held together by two machine screws. With proper locking of the screws this type can be made very reliable, but it is rather unhandy to disconnect.

In the fourth method a connector of somewhat similar design is made from copper tubing. Results have demonstrated that this is not quite as good as the third type as the insulation over the ends of the cable is not protected by the connector. Bending occurs continually in service and in order to prevent breakage of the strands of the cable, the bending should be distributed over a considerable length, if possible.

The fifth method shows what has been commonly known as the knuckle-joint connector, which is a quick break type. This type of connector is used largely on railways to connect the motor leads to the car wires and has been made in various designs. Four general types of knuckle joints have been used most extensively. The first of these is the old style pin or pivot type, in which a heavy steel hinge pin is riveted in the face of one of the half elements. As will be seen in the illustration, there are a male and a female element, which are not interchangeable.



Various designs of motor lead or knuckle joint connectors leading up to the present standard new style pin type

No. 1—Old-style pin or pivot type. No. 3—New-style pin type.
No. 2—Segmental type. No. 4—Combination of segmental type with new-style pin type.

The second form has been termed the segmental type. In this a small brass segment is riveted in a circular groove in the face of each half element, so that both elements are alike and the two halves are interchangeable. This type has a limited use as it is suitable for connectors of $\frac{3}{4}$ in. diameter or larger.

A third design is the new style pin type. In this a small steel pin replaces the brass segment of each element of the segmental type. Both elements are alike and the halves of the connector are interchangeable.

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Further, any element of this type is interchangeable with any element of the same size connector of the segmental type. This design was originally developed for connectors of $\frac{9}{16}$ in. outside diameter. However, due to its broader application, it was finally adopted as the most economical construction for all sizes of connectors.

The fourth type, sometimes called the jack-knife or clasp type, is used almost exclusively by two large motor manufacturers on the cable leads of their railway motors. The accompanying table shows the important dimensions of the standard size connectors, and the horsepower ratings of the motors for which they should be used.

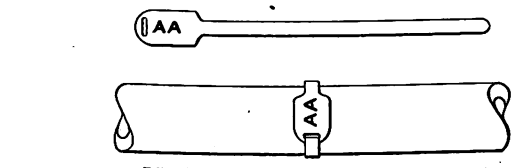
DIMENSIONS OF KNUCKLE-JOINT CONNECTORS

Motor Rating, Hp.	Dimensions in Inches					
	Outside		Counterbore		Drill for Cable	
	Length	Diameter	Depth	Diameter	Depth	Diameter
Up to 45	3 3/4	9/16	None	None	1	5/16
46 to 80	4 1/2	3/4	1/2	5/8	1 1/4	3/8
81 to 120	5 1/4	7/8	5/8	3/4	1 1/2	7/16
121 to 160	5 3/4	1	3/4	7/8	1 11/16	1/2
161 to 210	6 1/4	1 1/8	7/8	1 1/16	2	9/16

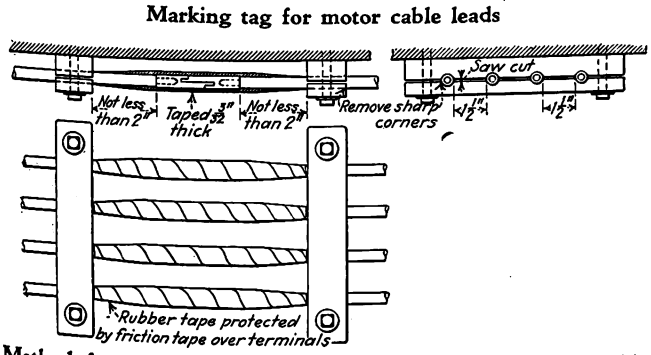
One of the most important advantages of the jack-knife or clasp type of connector is that the quick break simplifies connecting and disconnecting of the motor leads. Slotting of the tips secures a spring action which improves the contact fit of the two rubbing surfaces. To be satisfactory, they must be made from a good quality of brass rod. There must be a large contact surface between the halves finished smoothly and fitted carefully to obtain a good electrical connection. The half elements of the same style must be identical so that all connectors of the same size are interchangeable Ends of each half element into which the cable conductor is soldered are machined to provide a support for the insulation at the cable end.

Protecting Cable Leads

To insure that the motor cable leads give the least possible trouble after connections are made to the car wiring cable, a number of precautions should be taken. Cable leads should be protected where they come out of the motor frame by a semi-hard rubber bushing. The leads must be made long enough to accommodate the full swing of the truck and suitable cleats should be used to hold the leads securely to the motor frame. It is also essential that similar cleats be used to hold the car wiring cable to the body of the car. Leads should be hung so



Marking tag for motor cable leads



Method for insulating and cleating motor leads with knuckle-joint connectors recommended by the A.E.R.E.A.

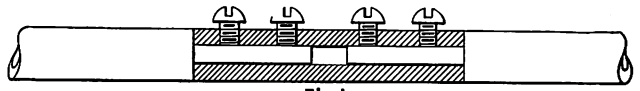


Fig.1

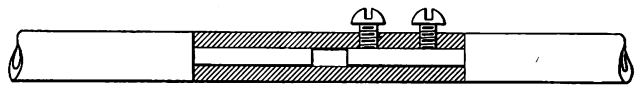


Fig.2

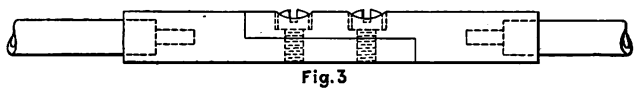


Fig.3

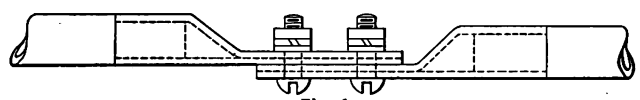


Fig.4

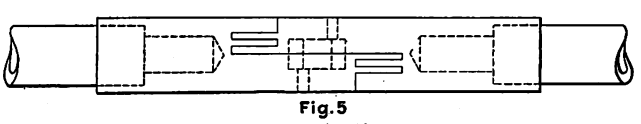


Fig.5

Types of cable lead connectors

Fig. 1—Solid type connector, each lead held by two machine screws.

Fig. 2—Solid type connector, one lead soldered and the other held by two machine screws.

Fig. 3—Jointed type connector, each lead soldered, halves held together by two machine screws.

Fig. 4—Jointed type connector, each lead soldered, halves held together by two machine screws and nuts.

Fig. 5—Jointed type connector, each lead soldered, halves held together by their spring action commonly called knuckle-joint, jack-knife, or clasp type.

that under all conditions they will swing free to avoid chafing and rubbing on any car parts. If it is not possible to prevent rubbing and chafing of the leads on top of the motor frame, some protection should be provided to keep the insulation on the cable from wearing through.

The knuckle-joint connectors should not be placed in the swing loop between the car underframing and the motor. When in place, the connectors should be insulated by using a piece of canvas or rubber hose. This should be taped at the ends to keep out water, dirt and dust. The point of support of the leads from the car body should be as near the truck center pin as possible in order to keep the swing of the leads to a minimum.

In the interest of standardization, both of the large railway motor manufacturers have adopted a common standard for the marking of railway motor cable leads. The following shows the new and old markings on the cable leads for Westinghouse railway motors.

Leads	New Markings	Old Markings
Armature connected to brush holder	A	A+
Armature connected to brush holder or commutating pole field	AA	A—
Main field	FF	F+
Main field	F	F—
Steel control lead	M	FM

All main wiring diagrams of Westinghouse railway motors dating from February, 1925, show both the old and new marking as indicated in the above table. Diagrams made before this date show only the old markings. All main wiring diagrams of the General Electric Company's railway motors show only the new markings.

The leads on the Westinghouse motors are marked with small tin tags, as shown in an accompanying illustration. These are tightly fastened to the cable.

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G. R. Fanning

Wins Maintenance Competition Prize for Month of February

EQUIPMENT used for testing pneumatic door engines as used in the shops of the Toronto Transportation Commission receives the $25 monthly prize for February in ELECTRIC RAILWAY JOURNAL'S Maintenance Competition. Honorable mention goes to W. J. McCallum, foreman frog shop, way department, Toronto Transportation Commission, for his description of a machine for grinding heel recesses in switch castings.

Gilbert Robert Fanning

who won the $25 monthly prize for February in ELECTRIC RAILWAY JOURNAL'S Maintenance Contest, is the leading hand in the pneumatic section at the Hillcrest Shops of the Toronto Transportation Commission, Toronto, Canada. Mr. Fanning left his position in the repair department of the T. Eaton Company, Toronto. in 1915, to enlist in the Canadian Expeditionary Forces for overseas service with the 95th Regiment. Later, he was transferred to the 1st Battalion Canadian Railway Troops, and served overseas until the completion of the war. On returning from service Mr. Fanning entered the employ of the Toronto Civic Railway as a motor and truck mechanic, and continued in this service until the amalgamation of the Toronto Transportation Commission, the Toronto Street Railway and the Toronto Civic Railway. Mr. Fanning was born and attended the public schools in Toronto. His first mechanical experience was in connection with his apprenticeship, which he served in the blacksmith and machinist trades with a carriage manufacturing company in Toronto.

AIR operated door engines on cars are coming into general use, and to insure proper operation should be tested carefully at each overhauling. The method used by the Toronto Transportation Commission of providing a model with weighted doors on which the door engine can be placed quickly and be given a test with conditions such as are encountered in service provides a satisfactory means for turning out this work. Installation and removal of the engine being tested is accomplished easily and in a short time.

A description of the test equipment used by the Toronto Transportation Commission was described in the Feb. 18 issue of ELECTRIC RAILWAY JOURNAL by G. R. Fanning, foreman of pneumatic section at the Hillcrest Shops, Toronto, Canada. This was awarded the monthly prize of $25 as the best maintenance item published in that issue.

Another practice used by the Toronto Transportation Commission receives honorable mention. This was the machine for grinding heel recesses in switch castings as described by W. J. McCallum. Switch recesses have a bad habit of wearing so that the heel of the switch tongue fits only where it touches. The device described appears to fill the need for a grinding equipment suitable for doing this work in the field without the necessity for removal of the switches from the track.

April 30 Closing Date for New Material

ACCORDING to the rules for ELECTRIC RAILWAY JOURNAL'S Maintenance Competition, as published on pages 700-701 of the April 16, 1927, issue, twelve monthly prizes of $25 each were to be awarded beginning with the May 21, 1927, issue. Due to the awarding of the capital prizes in September, no monthly prize was awarded that month, so the last monthly prize will be awarded for articles published in the May 19, 1928, issue of ELECTRIC RAILWAY JOURNAL, and as has been frequently announced in these columns, the closing date for material to be eligible for one of the monthly prizes is April 30, 1928.

This means that those who still have material that they wish to get in before the contest closes must send it in at once. Many have already expressed a desire to send in articles, and it is hoped that all maintenance men will avail themselves of this opportunity so as to get their material in promptly. In connection with material already received which has not been published, and material sent in during the next month, there will be an important announcement made in the April 21 issue.

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Electric Railway Journal Maintenance Data Sheet

TRACK AND WAY DEPARTMENT—22

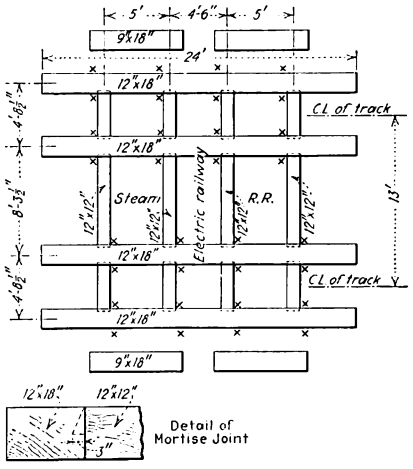
Anchored Crossings That Will Not Drift With Traffic*

By A. E. Gleason

Assistant Superintendent of Construction Louisville Railway, Louisville, Ky.

STEAM over electric crossings can be kept from drifting with steam traffic by use of a method of anchoring that is used by the Louisville Railway, as shown in the accompanying illustration. Timbers of appropriate size are framed into the construction. Crossings are of solid manganese 6 in. deep with 1-in. continuous plates, which are the same width as the timbers on which they rest. The crossings are fastened securely to the timbers with 1-in. bolts.

Excavation is carried well beyond the outside joints to a depth of 5 ft. The concrete slab is poured to a depth of 3 ft., using a 1:2:5 mix. As the slab is being poured 5-ft. lengths of old 9-in. girder rail are placed as shown in the sketch. These are inclined in the direction opposite to travel on the steam railroad tracks. The tops of these rails come to within 4 in. of the top of the running rail. After the slab is set well the crossing is air tamped with dry concrete of 1:2:5 mix. The concrete is then brought up to within 3 in. of the top of the rail paving grade. The crossing is paved with Kentucky rock asphalt or cold patch preparation with asphalt base, making a water-tight job.



Installation used by the Louisville railway to keep crossing from drifting with steam traffic

X Indicates short section of 9-in. rail embedded in concrete and inclined in the direction opposite to travel on the steam railroad.

*Submitted in Electric Railway Journal Prize Contest

Electric Railway Journal Maintenance Data Sheet

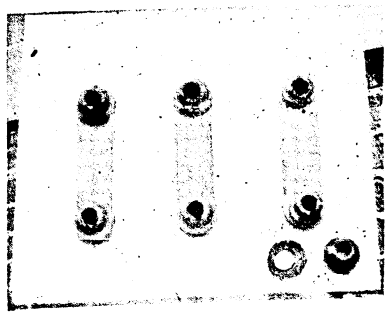
ROLLING STOCK—TRUCKS—21

Reclaiming Ball Type Brake Shoe Hangers*

By John McDowell

Foreman Blacksmith Toronto Transportation Commission, Toronto, Canada

REMOVAL of ball type brake hangers on cars of the Toronto Transportation Commission is due principally to the cup bushings becoming worn. In reclaiming these for further use the hangers are machined with a special tool and new cup bushings, forged and hardened, are installed. This effects a great saving of material, as the original hangers can be used several times, only the cup bushings requiring renewal. The accompanying illustration shows a new hanger, a hanger with worn ball and a hanger machined to receive the cup bushing.



At left, new ball type hanger. In center, hanger with worn ball. At right, hanger machined to receive cup bushing

*Submitted in Electric Railway Journal Prize Contest.

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Electric Railway Journal Maintenance Data Sheet

TRACK AND WAY DEPARTMENT—23

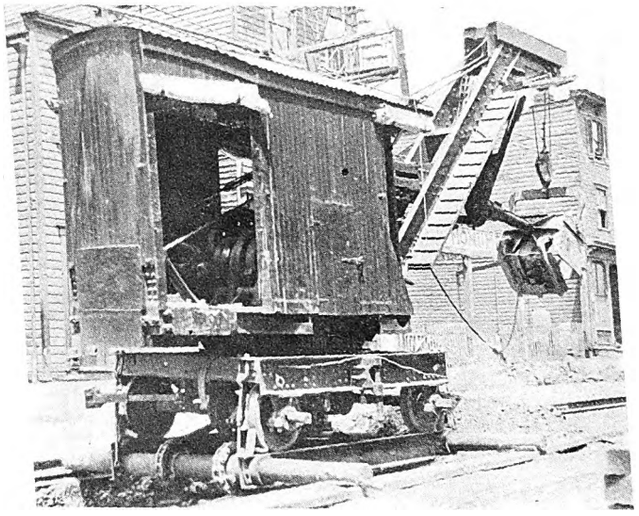
Convenient Mounting for Electric Shovel Truck*

By J. A. McCartney
Superintendent of Construction Pittsburgh Railways, Pittsburgh, Pa.

RIGID mounting, such that track obstructions usually encountered will not interfere with the progress of the work is provided in an electric shovel incorporating several novel features that has been developed by the Pittsburgh Railways. This was constructed from a standard shovel truck and the mounting provided enables from 500 to 700 ft. of trench excavation 2 ft. deep per day. It has advantages over the caterpillar type of truck in wet weather and also makes possible the use of short sections of portable track in the trench.

For an electric shovel to operate at maximum efficiency on street railway track construction it must be able to operate in all kinds of weather at full capacity and must not require too many attendants. Frequent adjustment of auxiliary equipment is undesirable and the equipment must be sufficiently flexible so that trench obstructions, such as gate boxes, sewer, water and gas lines may remain undisturbed without slowing up the work.

The truck illustrated weighs about 3 tons. It is transferred from one job to another with the company's 5-ton road crane. As shown in the illustration, the rollers rest at one end on 2-in. planks placed on the street flank, while the other end, which is grooved, is supported by light-weight T-rail sections spiked to the ends of the ties of the adjacent track. The shovel has a drive chain connection at the center of the rear roller. A single adjustment of the length of the dipper handle controls the limiting depth of excavation.



Electric shovel truck facilitates excavation for track reconstruction work

*Submitted in Electric Railway Journal Prize Contest.

Electric Railway Journal Maintenance Data Sheet

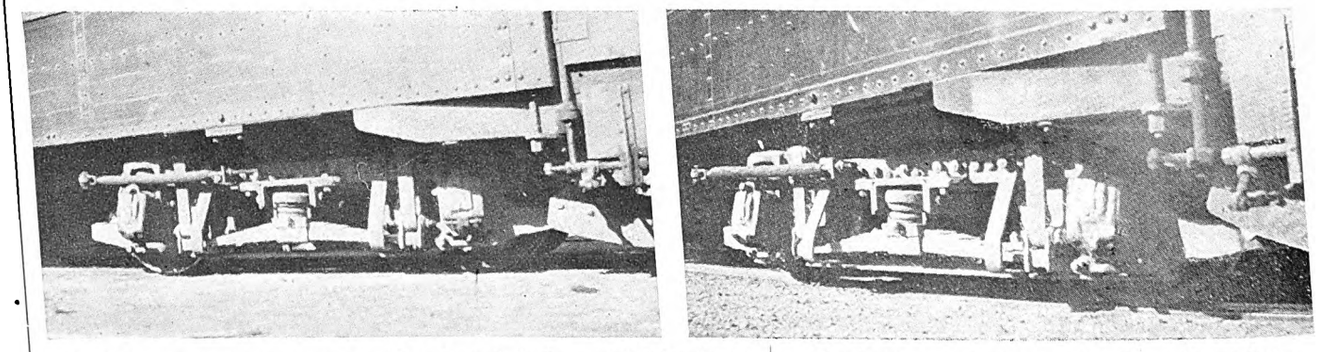
ROLLING STOCK—TRUCKS—20

Improved Pedestal Tie Bar Extends Across Truck Pedestal Jaws*

By R. T. Chiles
Master Mechanic Cumberland County Power & Light Company, Portland, Me.

ON CARS of the Cumberland County Power & Light Company equipped with Brill 77-E-1 trucks the pedestal tie bars originally were clamped to the bottom end of the semi-elliptic spring safety hanger. In order to prevent trouble from pedestal jaws spreading under brake application an improved type of the bar has been installed which is made of a ½-in. x 2½-in. x 2½-in. angle. It is bolted with countersunk-head bolts to the bottom end of the semi-elliptic spring safety hanger and extends across both openings of the truck pedestals.

In applying the angle tie bar it was necessary to form an opening by mashing down the top edge of the angle to permit the semi-elliptic spring seat rocker to swing. It was also necessary to notch out the top edge of the angle ½ in. deep by 6½ in. long to clear the bottom side of the journal box.



At left, original arrangement of pedestal tie bar, which is clamped to the bottom end of semi-elliptic spring safety hanger. At right, improved tie bar extending across pedestal jaws

*Submitted in Electric Railway Journal Prize Contest.

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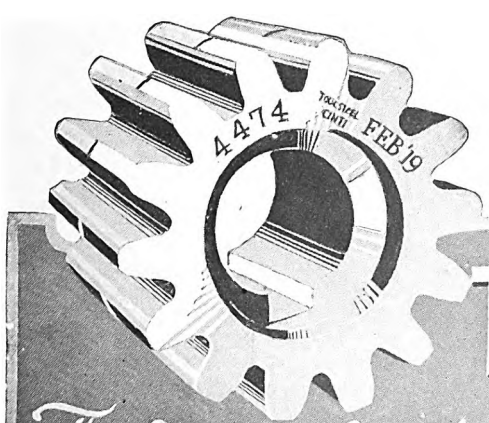
"TOOL STEEL" Pinions pay Big Dividends on Safety Car Motors

A User tells his Experience

"Due to excessive breakage of the pinions we were using, we began, about two years ago, and eventually replaced all of our 108 motors, with "Tool Steel" pinions which, of course, stopped the breakage. When we had so many pinions break last year, it was not uncommon to have a broken gear or a pair of wheels ruined due to the Operator or Inspector trying to clear up the line and sliding the wheels to a turnout or clear to the barn. You know how much a new gear costs and you probably know that it costs about $30.00 to change a pair of wheels, so I feel satisfied, that I'd rather have a 'Tool Steel' pinion."

The above quotation from the letter of a user of "Tool Steel" Pinions further confirms our contention that "Tool Steel" Gears and Pinions reduce maintenance.



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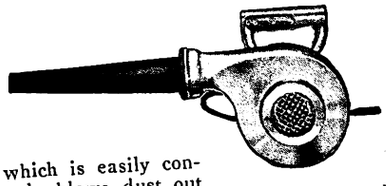

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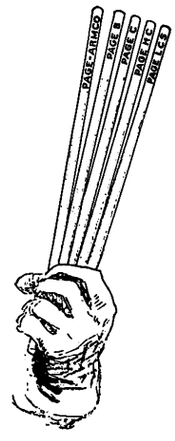

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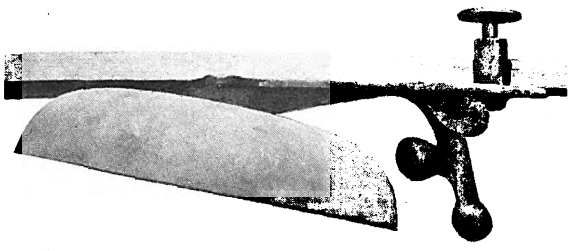
Electric Railway Journal Maintenance Data Sheet

ROLLING STOCK—MISCELLANEOUS—26

Handy Type of Foot Gong Bracket*

By A. M. Lindsay
Superintendent of Rolling Stock Montreal Tramways, Montreal, Canada

REPLACEMENT of a deflecting foot gong or knocker without taking down the bracket is possible with a type of bracket used by the Montreal Tramways. The bracket is made of malleable iron and is fastened to the car underframing by ¼-in. carriage bolts. The gong is fastened to the bracket by a square-headed bolt, the casting being countersunk so that the bolt is held from turning. The nut is inside the gong and can be unscrewed readily when it is desired to remove the gong.



This foot gong bracket provides for removal of gong or knocker without taking down the bracket

The knocker is pivoted on two arm extensions from the bracket and can be slipped into or out of position from the open end of the slot. To safeguard against possibility of the knocker getting out of its bearing groove a cotter pin passes through the two bearing ribs outside the knocker shank.

Submitted in Electric Railway Journal Prize Contest

Electric Railway Journal Maintenance Data Sheet

ROLLING STOCK—ELECTRICAL—42

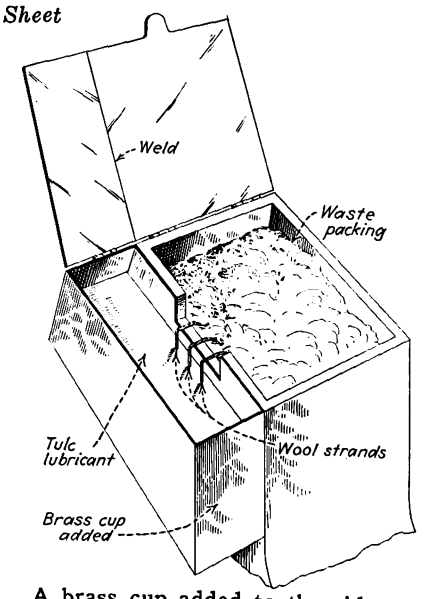
Better Lubrication for Old Type Motors*

By Benjamin H. Hall
Shop Foreman West Penn Railways, McKeesport, Pa.

SOME Westinghouse No. 56 railway motors originally arranged for grease lubrication have been changed over to oil and waste lubrication in the shops of the West Penn Railways. Several different methods have been tried, but the one which has proved most satisfactory consists of fastening a 1/16-in. rectangular brass cup to the outside end of the bearing housing. This is held in position by two ¼-in. round-head stove bolts. The cups used are 1⅜ in. x 3½ in. x 4 in. for the pinion end and 1 in. x 3½ in. x 4 in. for the commutator end. The top of the brass cup is flush with the top of the lubrication opening as originally provided in the motor. The stove bolts which fasten the cup to the housing have the heads soldered on the inside of the brass cup to prevent leaking if the bolts should become loose in service. In order to provide a covering for the new cup a No. 14 gage sheet iron extension is welded to the cover.

The original opening is packed with wool waste so as to fill this and bear on the armature shaft. The new cup is filled with Tulc lubricant and this is conducted to the top of the wool waste packing by capillary action through wool strands. There are three of these strands used on the commutator end bearing and six on the pinion end.

To provide space for these wicks to go from the brass cups into the main opening a notch ⅛ in. deep by 1¼ in. wide is cut at the top. A lip from the brass cup extends across this notch over into the original opening and the wicks lay on this lip. At the pinion end a partition in the center of the lip is provided so that three wicks lay on either side. When installed the cups are filled nearly full and after that scheduled additions are made.



A brass cup added to the side of the original lubricant opening provides for conducting oil to the top of the waste packing

Submitted in Electric Railway Journal Prize Contest

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Electric Railway Journal Maintenance Data Sheet

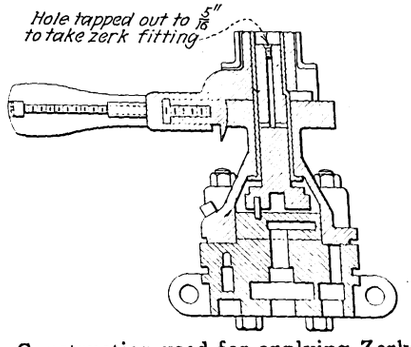
ROLLING STOCK—MISCELLANEOUS—27

Zerk Fitting Used for Lubrication of Brake Valve*

By H. C. Pressler

Master Mechanic Eastern Texas Electric Company, Beaumont, Tex.

FOR lubricating M-28 brake valves the Eastern Texas Electric Company uses Zerk fittings. A hole drilled in the brake valve top is tapped out to take the standard Zerk fitting. A cap screw is used to cover the fitting. This keeps the grease from blowing back into the operator's face and also keeps the top clean, so as to eliminate danger of dirt getting into the valve. It also prevents an accumulation of grease which might injure passengers' clothing.



Construction used for applying Zerk fittings to M-28 brake valve

*Submitted in Electric Railway Journal Prize Contest.

Electric Railway Journal Maintenance Data Sheet

ROLLING STOCK—ELECTRICAL—43

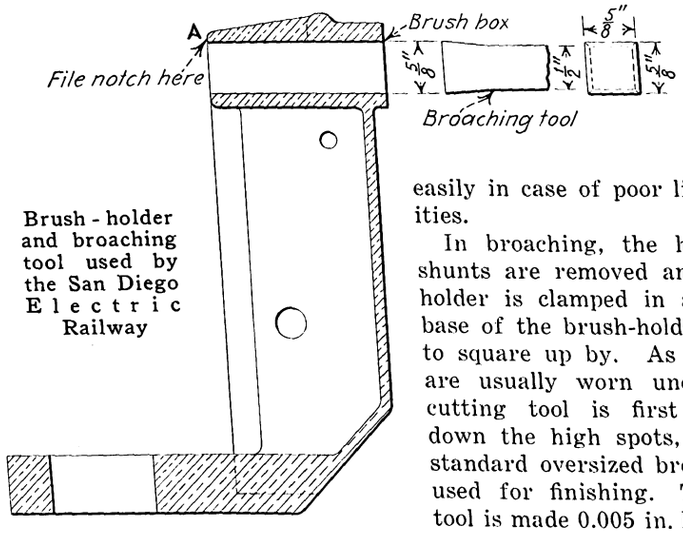
Brush-Holders Broached When Worn*

By Charlie Herms

General Foreman San Diego Electric Railway, San Diego, Cal.

RAPID wear of brush-holder boxes is caused by sharp particles of sand being sucked into the motors used by the San Diego Electric Railway. Brush-holders are broached out to a size $\frac{1}{16}$-in. larger than originally, when they become worn and a brush $\frac{1}{16}$-in. thicker than the original is used. No difficulty has been experienced from the use of the thicker brush. By this method double the life results from brush-holders, and the cost of broaching is very small.

In order to provide for easy identification of brush-holders that have been broached, each holder is marked by filing a good-sized V-shaped notch in the top center of the brush-holder. This notch is large enough so that the inspector can feel it easily in case of poor lighting facilities.



Brush-holder and broaching tool used by the San Diego Electric Railway

In broaching, the hammers and shunts are removed and the brush-holder is clamped in a shaper, the base of the brush-holder being used to square up by. As brush-holders are usually worn uneven, a small cutting tool is first used to cut down the high spots, and then the standard oversized broaching tool is used for finishing. The broaching tool is made 0.005 in. larger than the brush to provide desirable clearance.

*Submitted in Electric Railway Journal Prize Contest.

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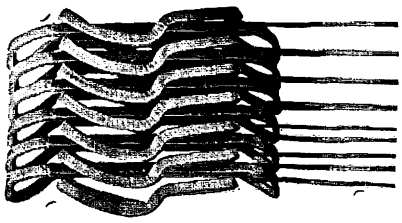

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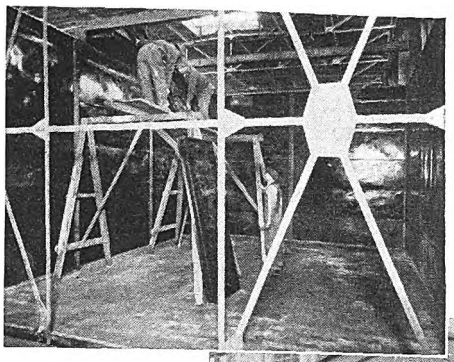
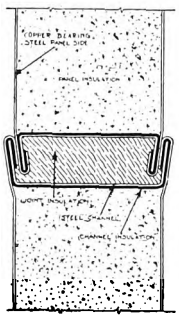
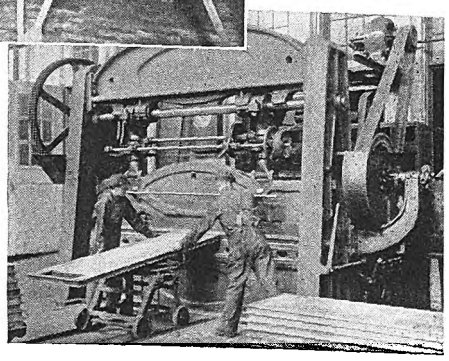
Why the Standard Panel







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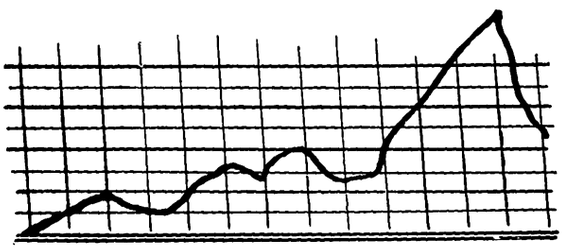

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News of the Industry

Bill to Renew Public Control in Boston

A bill is under discussion in the Massachusetts Legislature for the extension of the public control of the Eastern Massachusetts Street Railway for a period of ten years. The measure is substantially the same in its provisions as the act of 1918 which created the present public control of the road, except that it does not ask for any more financial guarantee by the commonwealth. The road is strong enough now to finance itself. The bill is offered by Mayor Ralph S. Bauer of Lynn. It has been indorsed by the Massachusetts savings banks, which hold Eastern Massachusetts securities.

At the first legislative hearing it developed that the mayors and ex-mayors and chamber of commerce representatives, senators and representatives in practically all the cities and towns served by the Eastern Massachusetts Street Railway are in favor of continuing the public control of the road. They declared, without exception, that service by the company is satisfactory, that the trustees are on most cordial terms with the people and public officials in the communities, and that the general feeling is that the present conditions should not be changed. The physical condition of the road is good and finances are encouraging.

The stockholders are making it known to the legislators that they feel the road should be returned to them at the end of the present ten-year period, which comes next January. They maintain, largely through L. Sherman Adams and Boyd B. Jones, that while the trustees have paid some dividends the common stockholders have received no dividends during the nine years of public control, and so long as they have no guarantee of dividends from the public trustees they desire to have the property returned for private operation. The stockholders maintain also, that if there is to be an extension of public control the period should be less than ten years, and the stockholders should have at least one representative on the board of trustees, and it should be made plain that when the dividend is earned it should be paid, even on the common stock.

The stockholders contend that the prospects of the company were hurt when the public trustees entered into a gentleman's agreement with the New York, New Haven & Hartford Railroad and the Boston & Maine Railroad under which the Eastern Massachusetts ceded to the railroads the right to operate buses between the large cities. That is a field the stockholders would like to see developed by the Eastern Massachusetts Street Railway.

The bill is before the committee on street railways. The public control will terminate at this time, unless the Legislature passes a new control bill which meets with the approval of the security holders.

Federal Court to Act on New York Fare Case

Jurisdiction was assumed on March 15 by the Federal Court over the transit problem in so far as the rate of fare which the Interborough Rapid Transit Company may charge and that company's relations with the city of New York are concerned. The special statutory court of three Federal judges began to hear arguments on the Interborough's application for permission to charge a 7-cent fare pending the final decision by the United States courts as to the amount of fare to which it is legally entitled.

Federal Judge William Bondy ruled that the Federal courts have jurisdiction. He continued the order which Federal Judge Francis A. Winslow issued on Feb. 17 and which stays the action of the New York State courts. In effect this order, which now stands until the statutory court decides whether the company may increase the fare, wipes out three injunction suits begun in the Supreme Court by the city and Transit Commission to enforce the 5-cent fare provision of the contract between the city and the company.

Judge Bondy's decision further provided, however, that the I.R.T. might not raise the fare until and unless the statutory court granted its application.

"And Live"

A WRITER once said, in effect, that whenever any of the great sayings were misquoted it generally results in a weaker word being used. Thus, "A little learning is a dangerous thing" is weakened whenever, as quite commonly happens, the word "learning" is replaced by the word "knowledge."

We ran across an exception the other day, but in this case the new word has been introduced deliberately. "Stop, Look Listen," is a slogan that has proved effective, but we admire the genius of the man who has made it read:

"Stop, Look—and Live."

The amended injunction is not for grade crossings and street intersections alone. It has received the magic touch which transmutes the well-known phrase into something close to poetry.—*Ottawa Electric Railway News.*

Baltimore Fare Question Goes to State Court

The United Railways & Electric Company, Baltimore, Md., has carried its fight for a straight 10-cent fare into Circuit Court No. 2. The company seeks to restrain the Public Service Commission from withholding from the United the right to charge a straight fare of 10 cents and also from charging two fares to Halethorpe, a suburban development. The commission recently granted the company a 9-cent cash fare with three tokens for 25 cents and reduced the number of fares to Halethorpe from two to one. The commission must answer within twenty days. When this is done a date will be set for hearing. The original petition by the United sought a straight 10-cent fare.

The United charges that the company's property is being confiscated in contradiction to the fourteenth amendment of the Constitution, the Maryland bill of rights and the public service law. According to the petition the maximum rate of fare the company is permitted to charge under the commission's orders is grossly inadequate to yield a fair return upon the fair value of its property.

It is also charged that the percentage which the commission found would be the rate of return upon the fair value of the company's property yielded by the fares established by said order was adopted by the commission as a fair rate of return solely for reasons and upon considerations that have no true relation to the fairness of a return, and was a grossly inadequate rate of return to compensate for the use of its property in the public service without confiscation of its property.

The petition says the amount which the commission determined would be a proper annual allowance out of earnings to provide for depreciation and retirement of the company's property used in the public service was grossly inadequate for that purpose and was fixed by the commission upon a basis that had no true relation to the amount required for said purposes, that no allowance was made, in determining the present value of the company's property, upon which the rate of return from the rates established must be calculated, for the net additions to its property since Jan. 1, 1924, and that the commission burdened the company with a substantial loss of revenue by requiring it to abolish the second fare upon its Halethorpe line which further diminished the immediate return upon the company's property.

In concluding the petition states that irreparable damage will be suffered by the company unless a preliminary injunction or restraining order is issued.

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New York Unification Bill Introduced

Senator Bernard Dowling introduced the Untermyer bill in the New York Legislature on March 14. It provides for creating a Board of Transit Control for the unification of subway lines in New York City. A joint statement of Senator Downing and Assemblyman Bloch said, in part:

The bill introduced is a mandatory 5-cent fare measure, provided the proposition of unified management makes good. It is written into the law "any such plan of readjustment, and any lease or leases entered into hereunder, unless otherwise determined by the local authority of the city and for such period or periods as it may determine, shall provide for a 5-cent fare for one continuous ride in the same general direction on the respective railroads embraced therein; provided, however, that adequate provision be made through priority of payment out of revenues, the establishment and maintenance of an interest and amortization fund or funds and otherwise for the periodic payment of interest and amortization charges payable by the board under such plan or under such lease or leases."

The transit bill is practically the same as the measure sent to Albany several weeks ago. Only a few minor amendments have been made to it. The Republican leaders announced at the time that they would give it serious consideration and if they could agree on it would have the measure introduced by the majority leaders.

Report of Cincinnati Project Expected Soon

His company is ready to take action at once that will speed up the settlement of the municipality's rapid transit situation, according to Walter A. Draper, president of the Cincinnati Street Railway, Cincinnati, Ohio. In his statement, made as the result of a report presented by a committee to the Cincinnatus Association, a semi-public organization, Mr. Draper said in part:

I don't know that anyone can be blamed for delay. In fact, I don't think "blame" is the proper word to use. If there has been delay, it has been due to the consideration of so important a subject. Time has been utilized in getting all the information possible before opening discussion of an operating agreement.

Our company has undertaken an analysis of the Beeler report (an expert's report made some six months ago to the city). I felt that we were justified not only in having our own engineers analyze the Beeler report, but also in having it done by A. L. Drum & Company, Chicago, for two reasons: One is that Mr. Beeler pointed out that the line could be operated without loss only in case a number of things more or less difficult are done, and then only by a very slight margin; the other is, that Mr. Beeler was one of the engineers called in by the city in the development of the lines.

We completed our own preliminary analysis some time ago, and I anticipate that Mr. Drum's report will be ready very shortly.

E. W. Edwards, president of the Rapid Transit Commission, said that as soon as he got word from the railway that it was ready to discuss the matter of a contract for leasing the rapid transit system, he would call a meeting for the purpose. The leasing, as well as bond issues for completing and equipping the system, would have to be submitted to a vote of the people of the city for ratification. Six million dollars has already been spent on the project, and it is estimated that completion and equipment will cost $8,000,000 additional, plus $2,500,000 if it is extended to Fountain Square, the center of the city.

Springfield Host of Three Associations

President Stevens epitomized principles which should guide participation of utilities in civic activities

JUST as busy individuals can take part in civic government with no desire for financial gain but with the certainty that they will have to sacrifice time and money in serving the public, so can the public service company be equally earnest in its citizenship. This is the opinion expressed by R. P. Stevens, president of the American Electric Railway Association, whose personal message to the joint session Wednesday morning, March 15, opened the two-day annual convention of the Illinois State Electric, Gas and Street Railway Associations in Springfield, Ill.

Mr. Stevens could not be present at the meeting and his message was presented by G. W. Welsh, president of the Illinois Electric Railway Association and vice-president of the East St. Louis & Suburban Railway. The remarks of the A.E.R.A. chief executive epitomized the principles which should guide their participation in civic matters. Quoting Mr. Stevens, "The utility is a citizen of its community as large as any individual to whom it renders service. It has a vital interest in everything that affects the community as a whole. It should be a booster, both through the utterances of its officers and through the high quality of the service it renders."

Government ownership was characterized as an attempt to transform the state into a benevolent Santa Claus, by Henry Swift Ives, vice-president of the Casually Information Clearing House, Chicago. He said the "old feudal doctrine that the government should support the people" is having a revival in this country. According to him altogether too many business men and property owners are ardent capitalists when it comes to their own business, but are apt to be just as ardent socialists when it comes to the business of the other fellow.

"There are no problems that can long daunt an industry that has the will to study and the capacity to learn," declared Oscar H. Fogg, president of American Gas Association. Mr. Fogg pointed out the need for fullest cooperation among the utilities if each is to serve to the best advantage and warned that dire days for present managements would come if anything was allowed to interfere with the public utilities' development to meet the needs of the nation.

C. Edwards Thorney, assistant to vice-president of the Chicago, North Shore & Milwaukee Railroad, outlined in the afternoon session the better business campaign in which the 2,000 employees of his company have been engaged for the past two years.

E. E. Soules, manager department of publicity, Illinois Traction System, augmented his paper with the presentation of still film views of advertisements to promote new business used within recent months by midwestern electric railways.

M. E. Hansen, of the Illinois Power & Light Corporation, Decatur, Ill., declared that the trend of motor coach design seemed to be away from the double-deck bus now used in big cities toward the 29- to 40-passenger single-deck bus.

The Springfield Engineers' Club made the conclusion of the first day's session of the convention the occasion for its annual dinner. At this dinner Col. Sidney Story spoke on the American merchant marine.

Council to Proceed with Chicago Subway Plans

Full approval to proceed with the work of drafting ordinance for downtown subway construction in Chicago has been voted to the board of local improvements by the City Council. As passed by the Council the resolution authorizes the board of local improvements to prepare ordinance for one north and south system and one east and west system, after public hearings are conducted, in any streets where property owners are willing to pay for a portion of the cost by special assessment.

According to Michael J. Faherty, president of the board, the first step will be to invite property owners to petition for subways. The board will, meantime, prepare estimates of the cost of construction and will then call a public hearing on the petitions. If the majority agree to the special assessment plan, ordinances will be drawn up and presented to the City Council. Following this Mr. Faherty believes, a test case will probably be taken to the Supreme Court in order to validate the special assessment paper. Once a favorable decision is obtained on this point the board can begin the actual construction.

The procedure contemplated by the resolution passed by the Council is based on the theory that subways can be built under the local improvements acts just as sewers are dug and streets widened—without additional legislation. Local traction officials, however, maintain that the city needs more power to levy special assessments for subway building. One of the set of five transit enabling bills prepared by the city, consideration of which was recently deferred until after the primaries in April, proposed to give the city complete power to finance subways in this manner.

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No 10-Cent Fare in Kansas City

Powell C. Groner, president of the Kansas City Public Service Company, Kansas City, Mo., has denied that the company will soon apply for an increase in electric railway fare to 10 cents. Statements had been published to the effect that the company contemplated asking for an increase of fares in June. Mr. Groner said:

I desire to state officially and unequivocably that no such application ever has been considered, discussed or contemplated. The company is proceeding in good faith to carry out to the letter its franchise agreement with Kansas City and expects to continue to do so.

If future conditions should warrant an increase in fares, this company will lay the facts before the City Council at the time, feeling confident that justice will be done all parties, but no such action is now being contemplated.

At the time the company received its franchise nearly two years ago the City Council was promised that no fare increase would be asked.

Continuance of Transfer Charge Authorized in Indianapolis

An order continuing the 2-cent transfer fee now being charged by the Indianapolis Street Railway on its lines in Indianapolis, Ind., was continued by the Indiana Public Service Commission on Feb. 27. The order, written by Commissioner John W. McCardle, provides that the charge shall be continued until further order of the commission.

Negotiations Opened Up in Toledo

The ultimatum of the new city administration at Toledo, Ohio, to the Community Traction Company, to pay a back paving bill of $187,500 with interest from February, 1921, by March 5, has been suspended pending settlement of a new power rate which under terms of the present agreement between the railway and the Toledo Edison Company will be retroactive to July, 1924. Mayor W. T. Jackson and Law Director George W. Ritter have taken the stand that no new negotiations looking toward extension of the present franchise and other things desired by the company will be started until the present Milner ordinance provisions have been complied with and controversial issues settled.

At a recent conference with the Mayor spokesmen indicated that the company was in no position to pay the claim for paving at the present time without resort, at least, to increasing fares; that it would be unable to go ahead with any paving program this summer if forced to pay; and that there were numerous other difficulties such as independent bus competition which, if remedied, might enable it to pay.

During the conference the matter of a new franchise and the previous negotiations were discussed. Company attorneys took the stand that no scaling down of capital value could be countenanced, but city spokesmen took the position that bond owners might be induced to bring in new money to build up the property and restore the value behind the bonds.

Negotiations to settle the power rate will be undertaken at once. Some other minor issues will also be settled following the power rate determination. Mayor Jackson indicated that he was willing to go through with a real settlement if the company would clean up points now at issue in the Milner plan operations.

Old Cars at Worcester to Be Burned

More than 100 cars of the Worcester Consolidated Street Railway, Worcester, Mass., which is rapidly disposing of all its worn-out rolling stock, are doomed to be burned within the next few months. The officials plan to burn two or three a day after the metal in them has been reclaimed. Some of the cars are 30 years old—many of the old single-truck type.

New one-man and two-man cars have gradually replaced many of the old cars, especially under the rehabilitation program of the New York, New Haven & Hartford Railroad.

No-Cruising Regulation Effective in Philadelphia

INTERESTING statistics are shown by a check recently completed by the traffic department of the Philadelphia Rapid Transit Company, Philadelphia, Pa., for the purpose of learning what effect the no-cruising regulation was exerting on the number of empty cabs in movement in the downtown streets. The results of this check, made on Chestnut Street between Juniper and Thirteenth after the beginning of no-cruising, were compared with those of a similar check made at the same season of the year, but before the new regulation went into effect.

A year ago, in spite of the smaller number of cabs, 1,877 empty cabs of all companies passed along this section of Chestnut Street between the hours of 9 a.m. and 6:30 p.m., an average of one empty cab every eighteen seconds. The figures of the recent check show that this number diminished from 1,877 to 630, an average of one empty cab every 54 seconds. This is an average reduction for all cab companies of 66 per cent. Figures for Yellow Cab alone show their reduction to be 69 per cent, three points better than the average figure. This was in the face of the fact that cab companies increased their fleets during the past year.

H. P. Savage in New Rôle

Howard P. Savage, past national commander of the American Legion and assistant general manager of the Chicago, North Shore & Milwaukee Railroad, has entered the race for delegate to the national Republican convention from the tenth congressional district in Illinois.

The petition for the nomination of Mr. Savage was filed by friends over his objection that "business and politics won't mix." He subsequently sent a letter to the secretary of state asking that the petition be withdrawn, but was informed that his name had already been certified and that it was too late to withdraw.

Mr. Savage is identified with the so-called Lowden-Deneen-Emerson Republican faction.

Kansas City Company Drops Objections to New Viaduct

The Kansas City Public Service Company has withdrawn objections to the early construction of a viaduct on Winner Road over the railroad tracks and the Blue River in Sheffield, and will join the city in overcoming the opposition of others, making prospects for the building of the viaduct considerably brighter. As planned the viaduct would be 3,513 ft. long. The total cost, apportioned among six agencies, is estimated at $1,900,000. Under the commission's apportionment, the share of the cost to the Kansas City Public Service Company would amount to $255,360. The three railroads and the Sheffield Steel Corporation have appealed the apportionment of the Public Service Commission.

Omission of Year from Date Misleading

The meeting with the Mayor, Common Council and interested department heads at Detroit, Mich., referred to in the ELECTRIC RAILWAY JOURNAL for Feb. 25, 1928, page 334, under the caption "More Moves to Speed Up Traffic in Detroit" was held on Jan. 24, 1927, not 1928, as a typographical omission made it appear. As the story stated, and as is generally known, the combined express street car and local bus service was placed in service on East Jefferson Avenue under date of Sept. 18, 1927. The date on the bulletin of the police department, reproduced as part of the article, was correct as given, namely, Jan. 26, 1928.

Atlanta School Ticket Sale Rearranged

Certificates are no longer needed in purchasing school tickets in Atlanta, Ga. The certificates signed by the principal or teacher before the car tickets could be sold to the children may now be purchased without identification and in any quantity at the rate

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of twenty tickets for $1. The new arrangements were made to eliminate the inconvenience to principals in having to fill out the certificates and the inconvenience to parents in being able to purchase only $1 worth of tickets at one time.

Dallas Fare Plea Withdrawn Without Prejudice

Formal steps to end the public hearing on the application of the Dallas Railway & Terminal Company, Dallas, Tex., for a 10-cent cash, 7-cent token fare were taken recently when Joe Worsham, general attorney for the company, read a statement for President John W. Carpenter, formally withdrawing the application at this time without prejudice.

Commissioner Clarence Parker moved that the statement be accepted. This the City Commission did by unanimous vote. After publicly thanking the company for its spirit in taking this action, Mayor Burt paid tribute to John W. Everman, supervisor of public utilities, who will be reappointed to that post.

Seattle Turns Down Mayor Landes

Bertha K. Landes, elected two years ago as Mayor of Seattle, by a majority of more than 6,000, lost re-election on March 13 by a majority of more than 19,000. It will mean her retirement on June 4. Her successful opponent is Frank E. Edwards, politically unknown. Mrs. Landes had taken an active interest in the municipal railway workings and had brought an intelligent understanding to the problems of that department. Recently, she stated that for the first time in the nine years the city owned the system "the future really looks hopeful" and the "railway is making substantial progress toward financial stability." She accompanied her statement with comparative revenue and expense figures for 1927 and 1926.

High-Speed Lines from Outlying Philadelphia Suggested

Proposals submitted by the Transit Department at Philadelphia to the City Council suggest high-speed lines from eastern Germantown and Chestnut Hill, Oak Lane and the wide residential section of the northeast feeding into the northern terminal of the Broad Street subway. At this time they await consideration by the transportation committee.

In its report the Transit Department laid particular emphasis on the proposed route through the northeast. The cost of this extension was estimated at from $5,400,000 to $43,000,000, according to the type of construction. Estimates for the Oak Lane and Chestnut Hill lines were lacking, but both would be shorter than the northeast extension and, therefore, less expensive.

Recent Bus Developments

Louisville Bus Bill Wins Unanimous Approval

With an amendment calling for a 10-cent bus fare for one year the bus franchise bill of Mayor Harrison was passed unanimously by the lower board of the General Council of Louisville, Ky., on March 13. It now goes before the Board of Aldermen and the next session of the Council, to be held March 20.

The earlier proposal for this ordinance insured a straight 7-cent fare for bus and street cars with interchangeable transfers from rail to motor and half fare for children during the remainder of 1928.

John L. Awtry, Councilman and a member of the revision committee, made the announcement that the committee had considered the bill and approved it with the addition of one amendment. That reads as follows:

The holder of this franchise may charge and collect toll during the first year of operations hereunder at a rate not exceeding 10 cents for each passenger carried within the city limits, with free transfers betwen bus lines in the making of single continuous trip. Transportation of school children shall be furnished at one-half fare and to policemen, firemen and park guards, when in uniform, free.

Provided, first, that if this franchise be acquired by a person or corporation operating in Louisville, a system of electrically propelled street cars running on rails, or by a subsidiary of such corporation, then such person or corporation shall furnish the free and reduced fare transportation hereinbefore set out, in addition, shall give and receive transfers for the making of a single continuous trip within the city limits upon terms as follows:

From bus line to bus line, and from bus line to electric car line, free; and from electric car line to bus line not for more than the differential between electric car fare and bus fare. The bus fare for the first year of operation shall not exceed 10 cents, and shall thereafter be controlled in the same manner and upon the same principle as the electric car fare, and

Provided, secondly, that by whomsoever the franchise may be acquired, in the adjustment of bus fare, electric car fare, and for transfer rules and charges, the rate or rates for service shall be such as to yield to the holder hereof a reasonable return upon the fair value of its entire and combined properties used and useful, employed in its city transportation service.

"Good Will" Tour in Virginia

Fifty members of the Virginia State Legislature, now in session at Richmond, were the guests of the Virginia Electric & Power Company Feb. 22 on a 100-mile bus trip to Alexandria, Va., where they attended elaborate ceremonies in honor of George Washington's birthday. President Coolidge was the guest of honor. The party was accommodated in the "Virginia" and "North Carolina," two of the company's de luxe touring units, which are elaborately finished in the colors of the two states.

Coach Lines Proposed for Santa Ana

The Pacific Electric Railway, Los Angeles, Cal., has applied to the Railroad Commission for a certificate to operate coach lines in Santa Ana.

Traffic Growth Provides for New Bus Service in Vancouver

A new bus was recently ordered by the British Columbia Electric Railway, Vancouver, B. C., for the Grandview highway run. The company refused to consider a request for extension of the railway system into the district served by Grandview; and agreed to place the extra bus in operation to meet a condition resulting from a growth in traffic. Half the loss on the operation of buses on this route is paid by the city.

Extra Service in Virginia

Additional transportation service will be furnished Hopewell, Va., citizens under a plan now being perfected by the Petersburg-Hopewell & City Point Railway. A bus has been procured and will be ready for service as soon as details can be arranged and permission obtained from the city.

Illinois Petitions Heard

Hearings on the recent application of the Elgin, Belvedere & Rockford Railway for a certificate to operate a passenger coach line between Rockford and Rochelle, Ill., were held in Chicago on March 13 by the Illinois Commerce Commission. The application of the Northern Illinois Service Company for a local permit for bus service connecting Rockford, Rochelle and Mendota, Ill., was consolidated with the Elgin petition and considered jointly.

Feeder Service in Chicago Extended

Recognizing petitions of more than a dozen local improvement and civic organizations, the City Council of Chicago recently gave its approval to eight new feeder bus lines to be established by the Chicago Surface Lines on the northwest side of the city. Two routes have already been approved by the Illinois Commerce Commission. Coaches of the Chicago Surface Lines have been operating in feeder service over a portion of the Diversey Avenue route for the past six months.

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Financial and Corporate

Trustee Acts Against Grand Haven Road

On application of the Guaranty Trust Company, of New York, trustees under the terms of the indenture securing certain bonds of the Grand Rapids, Grand Haven & Muskegon Railway, District Judge Raymond on March 6 signed an order to show cause why the operation of electric cars over the interurban should not be discontinued. It is proposed to increase the operation of buses over the route which parallels the interurban right-of-way.

The Grand Rapids Trust Company is receiver for the railway and the mortgage under which the Guaranty Trust Company acts as trustee secures an issue of first mortgage bonds amounting to $1,500,000, of which interest and principal payments are claimed due.

The railway completed its first year's operation under receivership on July 31, 1927. Its losses during that period were $27,768, exclusive of interest on bonds. These losses have continued, it was explained.

Intervention Right to Chicago Certificate Holders

Owners of series 1 certificates of the Chicago Railways on March 6 won the right to intervene in the bankruptcy and foreclosure proceedings now pending against the company.

The victory, limited to bare intervention, was won when the United States Circuit Court of Appeals ordered the issuance of a peremptory writ of mandamus, directing the U. S. District Court to grant permission to Orville E. Babcock, representing a protective committee of series 1 certificate holders, to file an intervening petition.

The plan behind the intervention proposal is said to be that purchasers of the certificates were guaranteed an 8 per cent cumulative return. They are seeking a share in the surplus of $6,000,000 now in the treasury of the Chicago Railways Company.

Approval of Terms of Cab Purchase Sought by P. R. T.

The Philadelphia Rapid Transit Company, Philadelphia, Pa., has agreed to pay $1,825,000 for the Quaker Cab Company and three suburban bus lines. This was disclosed in a petition filed by the railway with the Public Service Commission for approval of the purchase of the four carriers. The proposed deal includes the purchase of 5,000 shares of the outstanding stock in the Quaker City Cabs, Inc.; 4,510 shares of the Montgomery Bus Company, Inc.; 1,000 shares of the Philadelphia Suburban Transit Company, and 200 shares of the Doylestown & Easton Motorcoach Company. What price is to be paid for each of these four properties was not disclosed, as the four are joined together in one sale. Action on the matter has been postponed pending completion of an appraisal of the four properties.

Brazilian Utility Is Sold

The South American Power Company, a subsidiary of American & Foreign Power Company, Inc., has acquired control of the South Brazilian Railways, Ltd., from the International Light & Power Company, Ltd.

New Director in Norristown

Thomas Newhall recently resigned as a director of the Philadelphia & Western Railway, Norristown, Pa. He is succeeded by Edgar C. Felton.

Sale of Morris County Traction Approved by Commission

The State Board of Public Utility Commissioners of New Jersey on March 10 approved sale of property of the bankrupt Morris County Traction Company, Morristown, N. J., to George R. Hann for $280,000. The sale was negotiated by Receivers Joseph P. Tumulty and Joseph K. Choate. The Public Service Co-ordinated Transport will operate buses over the routes formerly covered by the company's lines.

Merger Hearings Concluded

Railways in Washington willing to accept $50,000,000 valuation with 7 per cent return although found value is $62,000,000 without bus allowance

MARCH 13 saw the close of the hearings at Washington, D. C., started in February with the purpose in mind of bringing about a consolidation of the Capitol Traction Company, the railway properties of the Washington Railway & Electric Company and the Washington Rapid Transit Company, operating the local bus lines. The plan in detail, previously adopted by the directorates of the several companies, was formally laid before the Public Utilities Commission on Feb. 15, with a petition for its approval by that body, with favorable recommendation to Congress for the legislation necessary to effect the change.

Unification of Three Systems Planned

The project involves the unification of the three corporations, with one of them maintaining a separate existence for stockholding purposes, with a capitalization of $52,400,000 and a valuation of $50,000,000 for rate-making purposes, the new company stipulating the right to earn a return of 7 per cent. This valuation of $50,000,000 is regarded by the companies to be a considerable concession, since the Capital Traction officials hold to a value of $26,000,000 for that property alone. A conservative value for both railways has been placed by company officials at $62,000,000.

At the outset of the proceeding William McK. Clayton, chairman of the public utilities committee of the Federation of Citizens' Associations, made a motion that provisions in the merger agreement referring to the bus company be stricken from the petition, but objections by William Gibbs McAdoo, chief legal counsel for Harley P. Wilson, principal owner of the Washington Rapid Transit Company, and S. R. Bowen of the legal staff of the Washington Railway & Electric Company were sustained by John W. Childress, chairman of the commission.

The demand for a merger has been expressed by various interests for the last twenty years and in order to meet that demand several previous attempts were made to bring about a consolidation. They failed because the parties thereto could not come to terms. The demand for a merger has been more insistent in the last few years and as a result the present plan was drawn up.

At one stage of the proceeding W. F. Ham, president of the Washington Railway & Electric Company, said:

> We have accepted the $50,000,000 not because we are not, in our judgment, entitled to a larger valuation, but upon the rather insistent demands of Mr. Wilson for a merger even if accomplished at some sacrifice to the companies and in the belief that the commission could easily satisfy itself that the property was worth in excess of $50,000,000. We have in the past been of the opinion that the value should be determined under the provisions of the public utility act.

He also is quoted as having said:

> It would further appear that no one can question the reasonableness of a 7 per cent return. The customary rate is 8 per cent. There are very few instances where courts or commissions have fixed a rate of return as low as 7 per cent. In a list of recent court decisions covering 23 cases, many of them United States Supreme Court cases, there is one instance of a 7 per cent return three of a 7½ per cent return, and nineteen of an 8 per cent.
>
> But the question before this commission is not whether these figures are exact in every detail, but are such as to enable them to satisfy their minds that the value of this new transit property is at least $50,000,000. I cannot see how it is possible for any one

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properly informed, to have any doubt upon this matter. You will have noticed that in this computation no allowance is made for the value of property of the Washington Rapid Transit Company, included in the merger.

Review of Valuation Cases

About a year after the passage of the Public Utilities Act in 1913, the Public Utilities Commission proceeded to value the property of all the public utilities subject to jurisdiction. The valuation of the Potomac Electric Power Company having been determined by the commission in 1917, two years in advance of the valuations of the Capital Traction Company and the Washington Railway & Electric Company, it was understood by all parties concerned that the Potomac case should be considered the key case. It was taken first to the Supreme Court of the District of Columbia, with a decision favorable to the commission; then to the Court of Appeals of the District of Columbia, with a decision favorable to the company; then to the Supreme Court of the United States, which refused to take jurisdiction, thereby leaving the decision of the Court of Appeals of the District of Columbia final, and the principles therein outlined binding in other cases pending before the courts. Final settlement of this case was reached by agreement between the commission and the company Dec. 31, 1924, and confirmed by the Supreme Court of the District of Columbia.

With the Potomac case out of the way the Capital Traction Company carried on its appeal, finally reaching a conclusion by decree of the Court of Appeals of the District of Columbia definitely fixing the value of its property, Jan. 1, 1925, as $25,756,880. The Washington Railway & Electric Company had not proceeded with its case, awaiting determination of the Capital Traction case.

Other Case Deferred

Some time after the determination of the Capital Traction case representatives of the Washington Railway & Electric Company conferred with the Public Utilities Commission, at which it was suggested the company figure its value according to the principles laid down in the Capital Traction case and submit these figures to the commission for their accountants to re-check. This was done.

The value of the Capital Traction Company, on Jan. 1, 1925, was $25,756,880, with additions of $267,769 since that date to make a total value within the District of Columbia of $26,024,559, and adding the value of properties in Maryland, $402,731, makes a total of $26,427,290.

Applying the principles of the Capital Traction case the Washington Railway & Electric Company had a value within the District of Columbia on Jan. 1, 1925, of $30,385,263, adding to this additions since that date of $955,401 makes a total value of the Washington Railway & Electric property within the District of Columbia as of Dec. 31, 1927, of $31,340,664, and adding the value of its property in Maryland, $4,360,493, makes a total value of $35,701,157. The two railroads therefore have a total valuation of $62,128,447.

At the concluding hearing President Hanna of the Capital Traction said:

> The only reason our company has not heretofore applied for a higher fare is that we have awaited the outcome of merger negotiations. Last September our board of directors was authorized to apply for a rate increase. We have not abandoned the idea.
>
> If there is no merger we will apply for increased fare. To obtain a fair return on the $21,000,000 to $22,000,000 of the $50,000,000 valuation which will represent our part, will still require an increased fare if there is a merger.

Some Matters for Commission's Determination

Mr. Hanna added that other questions than valuation and rates, including character of service to be rendered, reduced fares for school children and labor policy, were none of them properly to be discussed in the merger hearing. He said they were matters for the board of directors of the new company and the public utilities commission to take up after a merger has been effected.

Cognizance Taken of the Investment Value of Electric Railways

HALSEY, STUART & COMPANY, INC., New York, specialists in public utility securities, all of whose literature bears the imprint "The strength of the Utilities" have just completed an advertising campaign in national media in which 24 advertisements were used to tell, in language readily understandable, something of the scope and importance of the utilities — their far-reaching contribution to social and economic progress, and their remarkable growth in recent years.

The ads were in nowise intended to be a comprehensive report or study, but the discussions do, in a measure, interpret the utilities from the point of view of both public interest and business enterprise. As the company itself has expressed the matter it is its "hope that they (the advertisements) may help further to promote the public good which the utilities now enjoy, and increase the widespread confidence in well established utilities as a field for investment." The ads have been reprinted in booklet form. They are exceedingly interesting, both as to text and illustrations.

Telling the investor about the electric railways

$279,075 Received from Ottawa Electric

In submitting their fourteenth annual report covering the year ended Dec. 31, 1927, the directors of the Ottawa Traction Company, Ottawa, Ont., report that $279,075 was received from the Ottawa Electric Railway during the year. With this amount was paid the usual quarterly dividends of 1 per cent, and a bonus of 1 per cent.

Twenty new modern P.A.Y.E. cars were purchased during the year and are now in operation. Several track jobs were renewed with heavy steel.

Will Hear Case of Maine Abandonments

A hearing is scheduled for April 10 on the proposal of the Cumberland County Power & Light Company, Portland, Me., which operates the Portland Street Railway under lease, to abandon several unprofitable railway lines. Opposing patrons are planning to present their side of the question to the Public Utilities Commission. An attempt will be made to restrain any order allowing abandonment with no replacement guaranteed. The operating company claims a heavy deficit has been accumulated due to operating these non-paying lines.

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Shareholders of Nova Scotia Tramways Submit New Plan

Shareholders of the Nova Scotia Tramways & Power Company, Limited, Halifax, Canada, dissenting from the company's proposed refinancing program, have unanimously adopted the proposal of Edmund F. Stevens, objecting to any disturbance of the present bond issue. By this means it is claimed the proposed refinancing can be accomplished at practically no cost to the shareholders.

It was pointed out that the time was too short for any concerted action in the matter, but that the shareholders would strengthen their position if they registered a complaint with the company. This committee put forward its arguments and plans to the management of the company and stated, if, after inquiry, any change of policy was decided upon another meeting of the shareholders would be called to discuss the question, before presenting the case.

A statement as to the management's proposed plan, and the program adopted by the meeting presented the new capital structure in the management's refinancing scheme as follows:

First Mortgage 5 per cent bonds	$3,500,000
Comulative preferred 6 per cent stock	750,000
No par common stock, 32,013 at 30	960,390
No par common stock, 2,510 at 30	75,300
Total	$5,285,690

In place of this it was suggested by the meeting that the present bonded indebtedness be undisturbed, and the capital structure be as follows:

First mortgage 5's	$2,250,000
General mortgage 7's	1,432,500
No par common stock, 2,510 at 30	75,300
No par common stock, 32,013 at 30	960,390
Total	$4,718,190

(In treasury, no par common stock 5,477; Total, 40,000.)

Comparing the present capital structure with that proposed by the company it was pointed out that the interest charges on old securities total $212,775 as compared with a total of $220,000 for interest on the new securities as proposed in the refinancing scheme, an annual difference of only $7,225.

Montreal Distributes Lost Ticket Fund

The City Council of Montreal, Quebec, Canada, has approved an arrangement under which the city and the Montreal Tramways will distribute a fund of $1,165,000, now in the hands of the company which represents lost or unused tramway tickets.

The arrangement, will be made subject to approval by the Montreal Tramways Commission. It provides that $500,000 of that amount shall remain with the company as a permanent fund against tickets lost or unused. Of the remaining $665,000, 50 per cent, or $332,500, will go to the fund destined ultimately to reduction of local fares; 30 per cent, or $199,500, will go to the city and will be used for parks and playgrounds, and the remaining 20 per cent will go to the company as profits.

For ten years, now, this question of the fund has been actively before the administrators of the city. At the time the new tramways contract was signed in 1916, no clause governing disposal of the sums coming from unused or lost tramway tickets was put into the agreement principally because the fund was negligible when the contract was under discussion. As years went by, however, the fund has mounted until now it stands at $1,165,000.

Results in Denver Before and After Allowing Depreciation

A report issued on the results of 1927 operation by the Denver Tramway, Denver, Col., showed $4.60 per share was earned on the preferred stock after allowing for depreciation. According to the Denver *Post* by figuring the net profit for the two years on the same basis a balance of $9.46 a share was earned in 1927, available for the preferred stock before allowing for depreciation. Due to a change in the method of bookkeeping the earnings of the company were reported at less than half as much as shown in 1926, but an analysis of the statement discloses a slight difference. The discrepancy occurs through the charging off of the depreciation item, understood to be $500,000, before making allowance for bond interest in the 1927 report, whereas this item had previously been deducted from the net profit figure, after all other expenses.

Using the 1926 method of figuring, gross operating income, less expenses and taxes, would be $1,467,884 for 1927, compared with $1,624,258 the preceding year. Interest on the underlying bonds was earned more than seven times, a showing even better than was made in 1926, as the bonded debt was smaller than in 1927. Interest on the general and refunding bonds was earned almost four times in 1927, compared with about 4.25 times in the preceding year. Balance available for preferred stock dividends and depreciation was $982,164, a decline of only $29,212 from 1926.

The 1927 income statement as issued by the company, together with the revised statement used in the comparative analysis, and the 1926 statement accompany this account.

INCOME ACCOUNT OF DENVER TRAMWAY AND DENVER & INTERMOUNTAIN R.R.

	Company Statement 1927	Revised Statement 1927	Statement 1926
Total operating revenue	$4,390,016	$4,390,016	$4,565,251
Operating expenses	*$2,940,084	$2,440,084	$2,452,131
Taxes	523,460	523,460	543,029
Total operating exp. and taxes	$3,463,544	$2,963,544	$2,995,160
Net operating income	926,471	1,426,471	1,570,091
Miscellaneous income	41,413	41,413	54,498
Gross income less operating expenses and taxes	$967,884	$1,467,884	$1,624,589
Interest on underlying bonds	207,064	207,064	249,959
Balance	$760,060	$1,260,060	$1,374,630
Interest on general and refunding bonds	322,100	322,160	322,175
Balance	$437,964	$937,064	$1,052,455
Net profit and loss credit less amortization of discount on funded debt	44,200	44,200	41,071
Balance for dividend requirements on preferred stock and depreciation	$482,164	$982,164	$1,011,383

* Includes depreciation.

Judgment in St. Louis Satisfied

St. Louis, Mo., through Associate City Counselor Dolan on March 1 acknowledged in the St. Louis Circuit Court satisfaction of the $2,431,868 mill tax judgment it obtained against the now defunct United Railways. The city accepted 16,212 shares of preferred stock issued by the St. Louis Public Service Company, the successor to the United Railways and foreclosure and reorganization, and $28,371 in cash, representing a 7 per cent dividend for the last quarter of 1927 in full settlement of the old judgment.

Capital Stock Tax Suit Lost in Boston

The Boston Elevated Railway, Boston, Mass., lost in its suits to recover the capital stock tax which it paid to the federal government during the first four years of public trusteeship, according to a recent decision of Judge Morton in the U. S. District Court. The suits for recovery were based on the contention that while the road was under public control it was not taxable by the federal government under the capital stock tax law. Approximately $50,000 in taxes, which have been paid under protest, are involved in the suits.

J. B. Hollister a Cincinnati Director

John B. Hollister, attorney, was elected to the board of directors of the Cincinnati Street Railway, Cincinnati, Ohio, at the annual meeting of stockholders held recently. He is the only new director. Mr. Hollister succeeds the late Albert J. Becht.

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Personal Items

Appointments on Illinois Traction System

H. A. Tuohy, assistant traffic manager, has been appointed acting freight traffic manager in charge of all freight matter.

W. H. Wylie, who has been traffic manager, is retiring from that position, but will continue with the company as special traffic representative.

E. E. Kester, assistant traffic manager, continues in charge of all passenger traffic matters.

These changes in the Springfield office were announced recently by D. W. Snyder, vice-president of the Illinois Traction System.

W. W. Kennedy New Assistant in Birmingham

Walter W. Kennedy has been appointed assistant to J. S. Pevear, vice-president and general manager of the Birmingham Electric Company, Birmingham, Ala. He has been an employee in the executive department since 1925. Prior to his affiliation with the Birmingham Electric Company, he practiced law with the firm of Bradley, Baldwin, All & White. He was commissioned an officer in the United States Army during the World War and has served two terms as president of the Junior Chamber of Commerce.

Mr. Kennedy was born in Birmingham. He was graduated from the University of Alabama as an L.L.B.

R. W. Kelley Superintendent at Ottumwa

R. W. Kelley has been appointed superintendent of transportation of the Ottumwa Street Railway and of the bus system of the Iowa Southern Utilities Company. He was assistant superintendent of transportation in Burlington and has extensive training in both bus and railway operation. Mr. Kelley succeeds O. E. Steiner, who has resigned after eighteen years of service.

Changes in Winnipeg

Promotions and changes on the Winnipeg Electric Company, Winnipeg, Canada, are as follows:

A. E. Parker, formerly managing secretary of the Winnipeg Board of Trade, has been appointed assistant to the president of Winnipeg Electric Company, in charge of public relations and publicity, effective March 1.

Lawrence Palk, who heretofore occupied the position of assistant to the president and secretary of the company, has been appointed assistant general manager, in charge of executive matters. He continues as secretary.

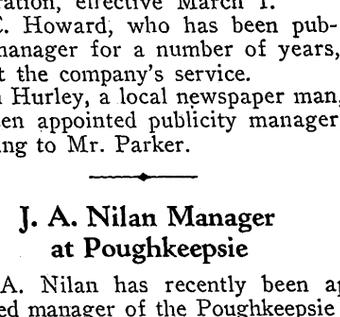
C. H. Dahl, who served as assistant general manager, had his title changed to assistant general manager in charge of operation, effective March 1.

H. C. Howard, who has been publicity manager for a number of years, has left the company's service.

John Hurley, a local newspaper man, has been appointed publicity manager, reporting to Mr. Parker.

J. A. Nilan Manager at Poughkeepsie

J. A. Nilan has recently been appointed manager of the Poughkeepsie & Wappingers Falls Railway, Poughkeepsie, N. Y. Mr. Nilan was connected with the New York Telephone Company and Brooklyn *Standard Union* from 1906 to 1907 as junior accountant and from there he entered the employ of the Central Hudson Gas & Electric Company, Poughkeepsie, N. Y. In this work he was engaged from 1907 to 1909.



J. A. Nilan

In the last-mentioned year Mr. Nilan accepted a position with the Poughkeepsie & Wappingers Falls Railway under the late Capt. J. W. Hinkley, Jr., who was then the president and manager of the company. He was appointed auditor in 1913 and assistant manager in July, 1927. The Poughkeepsie & Wappingers Falls Railway operates 20 miles of line. It is being operated by Hemphill & Wells, engineers, 43 Cedar Street, New York City.

Mr. Nilan was born on March 22, 1884. He was graduated from Eastman Business School, Poughkeepsie, N. Y.

A. C. Baker Succeeds His Father at Birmingham

Arthur C. Baker has been recommended by the Birmingham Corporation Tramways Committee to be general manager of the Birmingham Tramways, Birmingham, England, succeeding his father, Alfred Baker, who is retiring. The new manager has been through a long and exhaustive experience in engineering. Since 1920 he has been chief engineer of the Birmingham Tramways. The Municipal Tramways & Transport Association last year awarded him first prize for an essay on tramway engineering.

W. W. Trench Succeeds M. F. Westover

Myron F. Westover, secretary of the General Electric Company for the past 34 years, retired on March 1 and William W. Trench, assistant secretary, has been elected by the board of directors to succeed him.

Mr. Westover has been actively identified with the electrical industry for 40 years, his first position being secretary to the late Charles A. Coffin, then treasurer and manager of the Thomson-Houston Electric Company. He was associated with Mr. Coffin until Mr. Coffin's death in 1926.

Mr. Trench, the new secretary, is a native of Staten Island. He is 36 years of age, a graduate of St. Lawrence University and the Brooklyn Law School and was admitted to the bar in 1916.

JOHN ALDWORTH, general manager of the Nottingham Corporation Tramways, England, has resigned after 30 years' service with the city in that position. The Tramways Committee has expressed its high appreciation of Mr. Aldworth's services, and proposed that he be retained as a consultant.

Obituary

SAMUEL P. GOULD, for eighteen years assistant secretary of the Selden Motor Truck Company, Rochester, N. Y., died recently at his Rochester home. Mr. Gould was widely known in the automotive industry in which he was a pioneer worker. It was on land owned by Mr. Gould that the Selden Motor Company plant was built. He was the company's first secretary.

HENRY A. ROBINSON, who was counsel of the Metropolitan Street Railway, New York, for many years, died at his home in Yonkers, N. Y., on March 12, at the age of 68. His demise was caused by pneumonia. Mr. Robinson had lived in Yonkers for more than 40 years and during that time had figured prominently in civic affairs. He was a trustee of the First Presbyterian Church and for twenty years had been head of the governing board of St. John's Hospital. While he was with the Metropolitan Street Railway he took a great interest in association activities and had a wide acquaintance among electric railway operators. After severing his connection with the Metropolitan Street Railway he was identified in a legal capacity with a number of prominent corporations, among them being the Pennsylvania Railroad and the American Telephone & Telegraph Company.

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Manufactures and the Markets

New Bridge Proposed to Connect El Paso with Juarez

Plans for a new bridge across the Rio Grande to connect El Paso with Juarez have been submitted for approval to the Department of Public Works of the Mexican Government by the El Paso Electric Company, El Paso, Tex. Upon the approval by the Mexican government, the plans will be submitted to the United States Congress for similar action. The proposed bridge will cost $250,000 and will replace the present structure on the Santa Fe Street crossing. The structure will be largely of steel and will be longer and wider than the existing bridge. Other improvements by the company, amounting to an additional $265,000, will include a new bus garage to cost $35,000.

Larkin Packer Buys Davis Boring Tool Company

Larkin Packer Company, St. Louis, Mo., has purchased the entire property and assets of the Davis Boring Tool Company, St. Louis. The Davis Boring Tool Company will preserve its identity as a division of the Larkin Packer Company. No changes are contemplated in the products of either plant at this time but sales territories will be thoroughly revised to include capable representation in every principal center.

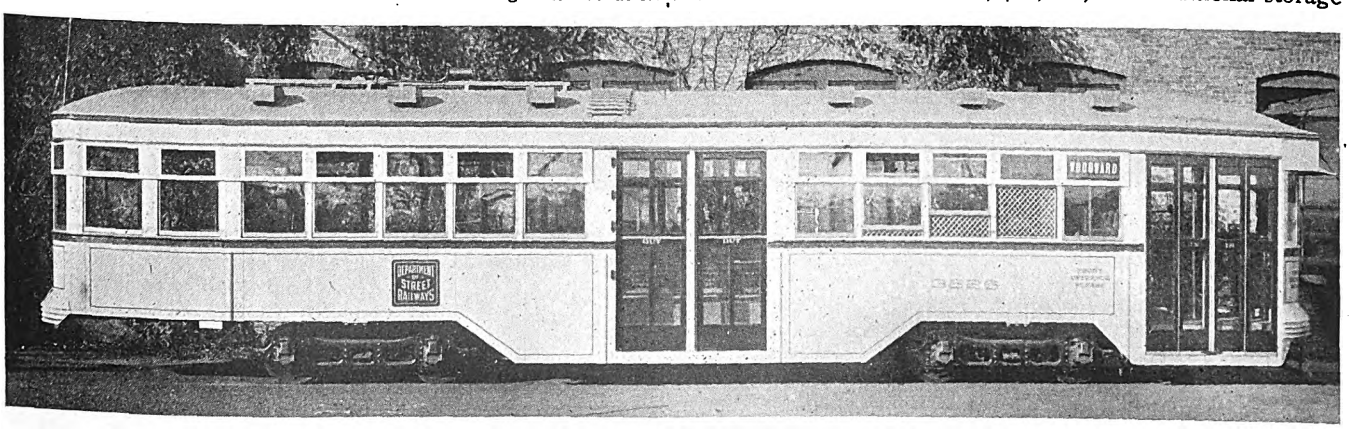
Supreme Court Upholds Interborough in Car Door Patent Case

The United States Supreme Court has upheld the decision of the Circuit Court of Appeals, Second Circuit, in the case of Samuel T. Walkup vs. Interborough Rapid Transit Company. This was a suit for alleged infringement of patent 1,379,583 on means for operating car doors. Reference to the Court of Appeals suit appeared on p. 37 of the issue of this paper for Jan. 7, 1928.

Shipment of 125 Detroit Cars Completed

Shipment of 125 new Peter Witt type cars for the Department of Street Railways of the city of Detroit, the order for which was noted in the JOURNAL of July 23 and Oct. 1, was completed about the first of the year. These cars have a length over all of 48 ft. 5 in. They are of single-end type and have a total weight of 36,000 lb.; a seating capacity for 52 passengers; are equipped with rattan seats and the interior trim is in cherry.

Name of Railway	City of Detroit, Department of Street Railways
City and State	Detroit, Mich
Number of units	125
Type of unit	Peter Witt two-man, motor, passenger, city, single-end, double truck
Number of seats	52
Date of order	June 20
Date of delivery	Oct. 18, first car
Total weight	36,000 lb.
Bolster centers	23 ft. 9 in.
Length over all	48 ft. 5 in.
Width over all	8 ft. 4 in.
Height, rail to trolley base	10 ft. 10 in.
Body	Semi-steel
Roof	Arch
Doors	Center and end
Air brakes	General Electric & Westinghouse straight air
Armature bearings	Plain
Axles	Heat treated
Car signal system	Faraday
Compressors	CP-27 and DH-16
Control	K-35-KK
Curtain fixtures	Curtain Supply
Curtain material	Pantasote
Destination signs	Hunter
Door mechanism	National Pneumatic
Doors	Folding
Fare boxes	Cleveland
Finish	Lacquer
Gears and pinions	Grade M. & B.P.
Glass	D.S.A
Hand brakes	Peacock staffless
Hand straps	Rico 7
Heaters	Gold electric
Headlights	Golden Glow
Headlining	Agasote
Interior trim	Cherry
Journal bearings	Plain
Journal boxes	Symington
Lamp fixtures	Electric Service Supplies
Motors	GE-265 and Westinghouse. 510-A
Roof material	Poplar T. & G.
Sash fixtures	O. M. Edwards
Seating material	Rattan
Steps	Stationary
Step treads	Kass
Trolley catchers	Ohio Brass
Trolley base	Ohio Brass
Ventilators	Railway Utility
Wheels, type	26 in. steel
Wheelguards or fenders	H.B.



One of the new 125 Peter Witt cars for the Department of Street Railways of the city of Detroit

Exhibitograph No. 4

FOUR weeks from the date of this issue of ELECTRIC RAILWAY JOURNAL applications will go out from the headquarters of the American Electric Railway Association for exhibit space at the convention to be held in Cleveland Sept. 22-28. Do not await the receipt of the blank. It is in the prospective exhibitor's interest to make his plans now, so that the application will not be delayed in reaching headquarters within the 30-day limit set for filing.

International Railway Installs Ohmer Registers

The International Railway, of Buffalo, N. Y., has just installed Ohmer printing fare registers in all of its city cars. The order called for 566 of the No. 22 type Ohmer registers, arranged to record three classes of fares, and operated by a pedal. With the new city installations, which have been recently completed, the entire electric railway system of the city of Buffalo, as well as all of the interurban lines feeding it, is now 100 per cent Ohmer equipped.

Seattle Plans Track Extension Program

Plans formulated by D. W. Henderson, superintendent of the Municipal Railway Department, Seattle, Wash., for a $1,077,668 track extension program for the municipal lines in various parts of the city, have been submitted to the City Council. Among the extensions planned are: double-tracking around Green Lake, estimated to cost $216,685; double track on Seventh Avenue N. E. and Fifth Avenue N. E., estimated cost $330,240; double track on Tenth Avenue N. E., $54,497; extension on 35th Avenue S. W., to serve the West Seattle district, to replace the buses now operated in that district, $164,401; Fifteenth Avenue N. E. extension, $44,513; Eighth Avenue N. W. extension, $193,680; additional track on the South Seattle line, $61,733; four additional storage

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tracks in the Fremont carhouses, $11,914.

If all these extensions are made, 50 additional street cars will be required, Mr. Henderson said. To date all efforts of the city to purchase new equipment have been halted because of conditions adverse to the placing of equipment trust obligations.

Columbus, Delaware & Marion to Build Shops in Delaware, Ohio

On Dec. 15, the shops of the Columbus, Delaware & Marion Electric Company, located at Stratford, Ohio, were destroyed by fire. As this location was beyond the city limits it was often difficult to secure labor and it was to the advantage of the company to locate the shops in Delaware.

As building in Delaware would mean additional investment the Delaware Chamber of Commerce subscribed $6,400 for preferred stock enabling the company to build new shops and carhouses within the city.

ROLLING STOCK

MUNICIPAL STREET RAILWAY, Monroe, La., will refinish its cars after the order of one just completed. The exterior of the car has been repainted a dark orange and the interior walls have been finished in oak color with woodwork in national maple, floor in maroon and ceiling in white enamel. The car has been completely overhauled mechanically.

NORTHERN OHIO POWER COMPANY, Akron, Ohio, has received delivery of seventeen twin coaches from the Twin Coach Corporation, Kent, Ohio. Eleven of these coaches are mechanical-drive, street car type and six are parlor coaches. A gas-electric urban type coach remains to be delivered.

HOUSTON ELECTRIC COMPANY, Houston, Tex., has ordered four more twin coaches from the Twin Coach Corporation. Delivery is expected the latter part of March, making 21 Twin Coaches in Houston.

SHOPS AND BUILDINGS

BIRMINGHAM ELECTRIC COMPANY, Birmingham, Ala., has nearly completed its new carhouse and repair shop. The carhouse is expected to be ready for occupancy within a month.

EASTERN TEXAS ELECTRIC COMPANY, Beaumont, Tex., is remodeling its carhouse and erecting a new Truscon steel bus garage at a cost of approximately $12,500.

TRACK AND LINE

KANSAS CITY PUBLIC SERVICE COMPANY, Kansas City, Mo., has started work on constructing a loop at the end of the Fifteenth Street line and repaving tracks on Jackson Avenue. The curves and crossings at 31st and Holmes Streets are to be reconstructed and the tracks on Fifteenth Street from Elmwood to Cypress Avenue are to be repaved.

LINN COUNTY LOGGING & LUMBER RAILWAY in the Albany district, Oregon, has applied for a permit from the Interstate Commerce Commission to build 68.6 miles of railroad to tap new timber interests in the Albany region, which will include 40.6 miles of standard main-line construction, at a cost of approximately $1,000,000, and the construction of four branches to cost $750,000. Connection with the Oregon Electric Railway is to be made 2 miles north of Albany, Ore.

TRADE NOTES

PANTASOTE COMPANY, New York, N. Y., has appointed H. G. Mastin, formerly with the Locomotive Stoker Company, assistant to W. A. Lake, manager of the railway and marine department.

PERFEX CORPORATION, Milwaukee, Wis., builder of heavy-duty industrial engine radiators, announce the opening of a Cleveland office in the Leader Building. A. C. Owen, formerly located at New York, will be in charge of this office, taking over all the Ohio territory in addition to the Eastern states which he formerly covered.

NATIONAL CARBON COMPANY, INC., has moved its branch sales office and factory of the carbon sales division from its former location at 357 West 36th Street, New York, to new and much larger quarters at the company's plant at Fourteenth and Henderson Streets, Jersey City, N. J. This change more than doubles the size of the former plant and considerable additional manufacturing equipment has been added to meet the increasing demand for its brushes and carbon products in the eastern district territory.

WATSON-STILLMAN COMPANY, New York, has elected William B. Updegraff, vice-president in charge of sales. For the last fifteen years Mr. Updegraff has been engaged in various engineering and sales capacities with this company.

WHITE COMPANY, Cleveland, Ohio, has appointed Stanley P. Seward, assistant to vice-president Saunders Jones. Mr. Seward will continue his direction of the advertising department in addition to the new duties he is assuming.

ELECTRO-NITE CARBON COMPANY, Philadelphia, Pa., announces that A. G. McMann is now in charge of its Michigan office, located at 307 Basso Building, 7338 Woodward Avenue, Detroit.

ADVERTISING LITERATURE

CROUSE-HINDS COMPANY, Syracuse, N. Y., has issued two bulletins, No. 2109, "Flood Lighting" and No. 2106 "Floodlights and Industrial Units." The bulletins cover the use of floodlights in commercial and industrial activities as well as for decorative purposes.

CHISHOLM-MOORE MANUFACTURING COMPANY, Cleveland, Ohio, has just issued a new complete catalog on electric hoists. The bulletin is No. 31 and is one of a series being prepared on material handling equipment.

WALTER A. ZELNICKER SUPPLY COMPANY, St. Louis, Mo., has just issued a new bulletin No. 354 giving descriptions and prices of equipment for handling sand and gravel.

SANGAMO ELECTRIC COMPANY, Springfield, Ill., has issued bulletin No. 67 describing the Sangamo type H C meters.

ELECTRIC RAILWAY MATERIAL PRICES—MARCH 13, 1928

Metals—New York

Copper, electrolytic, cents per lb.	13.825
Lead, cents per lb.	6.00
Nickel, cents per lb.	35.00
Zinc, cents per lb.	5.65
Tin, Straits, cents per lb.	50.25
Aluminum, 98 or 99 per cent, cents per lb.	24.30
Babbitt metal, warehouse, cents per lb.:	
Commercial grade	57.00
General service	31.50

Bituminous Coal

Franklin, Ill., screenings, Chicago	1.825
Central, Ill., screenings, Chicago	1.675
Kansas screenings, Kansas City	2.125

Track Materials—Pittsburgh

Standard steel rails, gross ton	$43.00
Railroad spikes, drive, ⅝ in. and larger, cents per lb.	2.75
Tie plates (flat type), cents per lb.	2.25
Angle bars, cents per lb.	2.75
Rail bolts and nuts, cents per lb.	3.90
Steel bars, cents per lb.	1.85
Ties, white oak, Chicago, 6 in.x8 in.x8 ft.	$1.40

Hardware—Pittsburgh

Wire nails, base per keg	2.65
Sheet iron (24 gage), cents per lb.	2.90
Sheet iron, galvanized (24 gage), cents per lb.	3.65
Galvanized barbed wire, cents per lb.	3.35
Galvanized wire, ordinary, cents per lb.	3.10

Waste—New York

Waste, wool, cents per lb.	16–20
Waste, cotton (100 lb. bale), cents per lb.:	
White	16–19.50
Colored	11–16

Paints, Putty and Glass—New York

Linseed oil (5 bbl. lots), cents per lb.	10.2
White lead in oil (100 lb. keg), cents per lb.	13.25
Turpentine (bbl. lots), per gal.	$0.64
Putty, 100 lb. tins, cents per lb.	5.50

Wire—New York

Copper wire, cents per lb.	16.125
Rubber-covered wire, No. 14, per 1,000 ft.	5.30
Weatherproof wire base, cents per lb.	16.50

Paving Materials

Paving stone, granite, 5 in. New York—Grade 1, per thousand	$150
Wood block paving 3½, 16 lb. treatment, N. Y., per sq.yd.	$2.70
Paving brick 3½x8½x4, N. Y., per 1,000 in carload lots	51.00
Paving brick 3x8½x4, N. Y., per 1,000 in carload lots	45.00
Crushed stone, ½-in., carload lots, N. Y., per cu.yd.	1.85
Cement, Chicago consumers' net prices, without bags	2.05
	1.75
Gravel, ½-in., cu.yd., f.o.b. N. Y.	1.00
Sand, cu.yd., f.o.b. N. Y.	

Old Metals—New York and Chicago

Heavy copper, cents per lb.	11.50
Light copper, cents per lb.	10.125
Heavy yellow brass, cents per lb.	7.125
Zinc, old scrap, cents per lb.	3.125
Lead, cents per lb. (heavy)	4.875
Steel car axles, Chicago, net ton	$16.25
Cast iron car wheels, Chicago, gross ton	14.25
Rails (short), Chicago, gross ton	15.75
Rails (relaying), Chicago, gross ton (65 lb. and heavier)	28.50
Machine turnings, Chicago, gross ton	7.75

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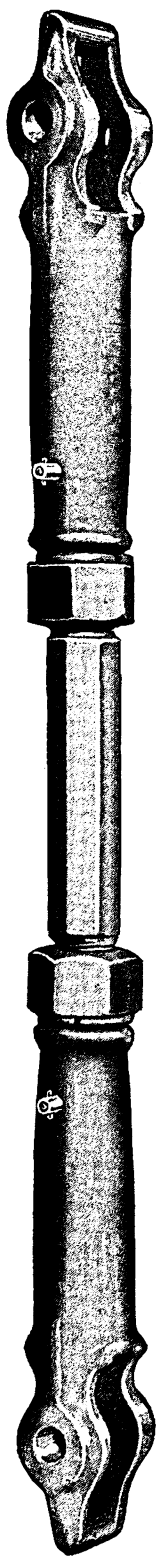
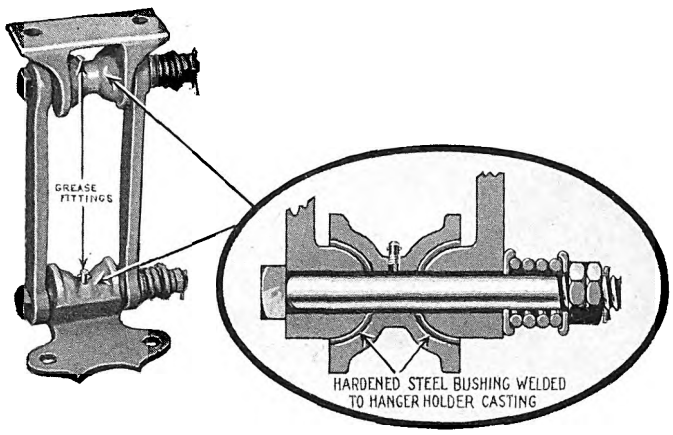


Brill Brake Adjusting Rod



Brill Half-ball Brake Hangers

The Advantages of Systematic Lubrication

THE Alemite System of lubrication will be applied to the brake adjusting rods and half-ball brake hangers on all Brill Trucks. The fittings are installed at the center of the half-ball brake hanger castings so the grease will flow to each hanger. On the brake adjusting rods, the fittings are installed over the threaded portion of the castings as illustrated.

There are a number of advantages which result from the regular use of this system of lubrication. In the first place, the ease with which lubrication can be accomplished insures regular use of the "grease gun." Noise reduction, a saving in time and labor, ease of adjustment and longer life for the more expensive castings are equally important advantages.

THE J. G. BRILL COMPANY
PHILADELPHIA, PA.
AMERICAN CAR CO. ST. LOUIS MO. — G.C. KUHLMAN CAR CO. CLEVELAND, OHIO. — WASON MANF'G CO. SPRINGFIELD, MASS.

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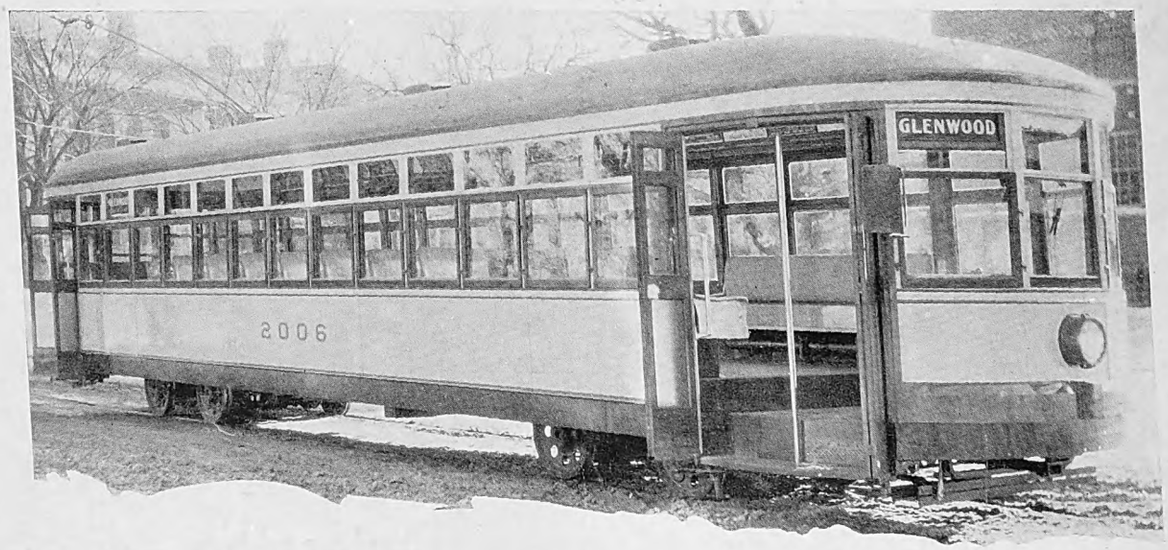
HASKELITE



HASKELITE *giving good account of itself on Twin City cars 8 years old*

HASKELITE roofs effect real economies in operation and maintenance. The decrease in dead load is obvious. The scales prove it. The resulting saving in operating cost is almost equally obvious.

The maintenance saving is only demonstrated as the equipment ages. The first year is no criterion of maintenance conditions.

Many operators have had HASKELITE roofs in service long enough to determine how they effect maintenance. For example, the Twin City Lines, St. Paul, Minn. have 49 cars equipped with HASKELITE roofs and headlinings which have been in service since 1920. This company writes that they never have had any trouble in the use of HASKELITE; that it makes a smooth strong roof, and they are well satisfied with it.

Get our blue print booklet showing other advantages of HASKELITE and PLYMETL in street car and bus construction.

PLYWOOD
HASKELITE
PLYMETL

Railway Representatives:

Economy Electric Devices Co., 37 W. Van Buren St., Chicago

Grayson Bros., 600 LaSalle Bldg., St. Louis, Mo.

Railway & Power Engineering Corp., Ltd., Toronto, Ont., Canada

Haskelite Manufacturing Corporation
133 West Washington Street, Chicago

ERJ-3-17

PLYMETL

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ELECTRIC RAILWAY JOURNAL

McGraw-Hill Publishing Company, Inc. MARCH 24, 1928 Twenty Cents per Copy

Luxurious service
– at a profit —

VERSARE
6 WHEEL HIGHWAY UNITS

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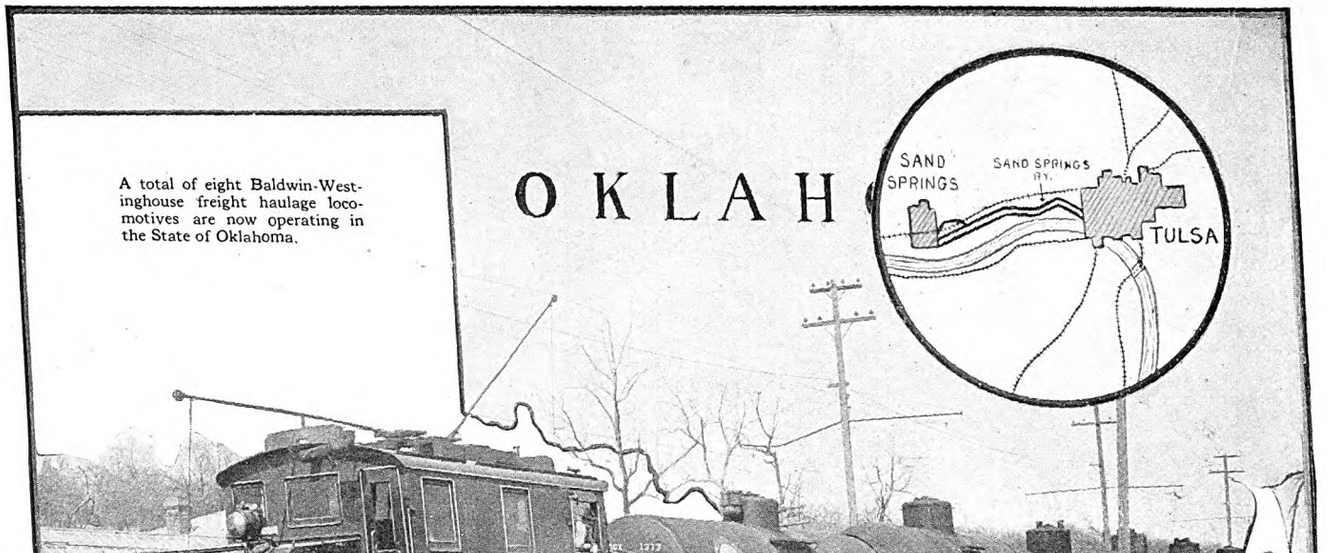

It's the *Fourth* One *for* Sand Springs

SERVING a flourishing industrial center between Tulsa and Sand Springs in Oklahoma, the Sand Springs Railway offers a fast, dependable freight service to the many diversified enterprises along its right-of-way.

Rapid and consistent growth of this business now requires the services of another Baldwin-Westinghouse 50-ton locomotive—the fourth one for this property:

The continued confidence of the Sand Springs Railway in Baldwin-Westinghouse freight haulage locomotives is another evidence that they are a profitable investment for reliable, inexpensive, safe and efficient motive power for freight movement in city and country.

The Baldwin Locomotive Works
Philadelphia Pennsylvania

Westinghouse Electric & Manufacturing Company
East Pittsburgh Pennsylvania

Baldwin-Westinghouse

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Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review
Published by McGraw-Hill Publishing Company, Inc.
CHARLES GORDON, *Editor*

Volume 71 New York, Saturday, March 24, 1928 *Number 12*

Getting Results from Employee Education

REALIZATION is growing that increased patronage for the transportation utilities is dependent in a measure on special training of employees. Street railway companies are finding themselves in an increasingly competitive business. It has been repeatedly observed in such business, other things being equal, that the greatest volume of patronage gravitates to the concern possessing the best trained employees. Consequently, the change in the transportation business from a monopoly to a competitive enterprise has emphasized the need for employees or "salesmen" so educated to an understanding of the business as to qualify them to create and maintain a cheerful contact with customers, both actual and prospective.

What, essentially, is a transportation "salesman"? Reduced to the simplest terms he would appear to be an employee who renders a class of service which pleases his customers. Training for this result consists of building up in each man's mind an understanding of the importance of three fundamentals: individual prestige, company prestige, and interest in his passengers or "customers." These are the ultimate objectives of electric railway educational work. The exact program to be followed requires a thorough understanding of the human factors involved and can only be developed from actual employee training experience. However, at the start, caution should be exercised against indulgence in too much academic instruction. The great mass of railway employees have not had much academic background; in fact it might be said that their particular aversion to it has some bearing on their present positions. Therefore, a pedagogical atmosphere or academic methods of transmitting an understanding of company policies may be expected to enlist little real interest from men who have an aversion to the class room. On the other hand, it is entirely possible to establish closer contact between operating officials and the men, and through such contacts to transmit a better understanding of the relation between the platform man and the passengers with whom he comes in contact.

This is not to say that the educational or employee training work of transportation companies should not be in the hands of specialists. It seems obvious that success in such work demands the entire attention of men who can devote their whole time to the development of a technique and procedure based upon close study and analysis of experience with employee training—both on their own and other properties. But such work should be conducted as an integral part of management; not as a side issue that can be turned over to an instructor and forgotten by the operating head. In fact, the education of transportation employees must be a part of the operation of the property and to enlist real interest the employee's contact with this work should impress him as an intimate contact with the management itself.

The language of employee education should be the language of operation—not that of the class room. The manager and department heads as well, must play their part in associating the educational work with the actual operation of the property. The work of equipping himself to handle the company's patrons as they should be handled is as much a part of the man's job as is the proper handling of equipment, fares or reports. Only by creating that point of view in the employee's mind can educational work accomplish the results sought.

Taking Time to be a Citizen

APPROXIMATELY two years ago a hard-pressed railway property changed ownership. When the new president arrived in town, a stranger, he found an unfriendly public and a fractious city government. The franchise situation was in a mess. Earnings were unsatisfactory; the company's service was condemned by public and press and the public co-operation necessary to bring about improvement was withheld.

After the short period that has elapsed since the change in management took place, this railway is giving the best service in its history. New franchises have been granted by the city and an *esprit de corps* has been built up among employees that is reflected hundreds of times a day in the contacts between platform men and car riders. The company's chief executive has been publicly thanked by the Chamber of Commerce for his service to the community. Public suspicion and antagonism have given way to confidence and friendliness.

How was this complete reversal in public relations brought about? For the answer, ask the man in the street. He reacts instantly to mention of the railway executive's name. Despite the arduous duties of running such a property, this man has found time to become one of the city's leading citizens. He belongs to five social clubs, the Rotary Club, and is a director of the Chamber of Commerce. In the latter body he serves as chairman of its river improvement committee and as a member of its advertising committee. He is a member of the city's port commission, forward movement committee, special gifts committee of the community fund, and the state higher education association. He is president of the safety council and a director of the retail merchants' association. He has toured the state with public bodies in the interest of good-will campaigns. In his own suburban community he is high in the councils of the citizens' association.

How has he found the time to give attention to all these community activities? He alone knows! But the results accomplished for his property speak for themselves. This man's activity is indeed in strange contrast

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with that of the utility executive of a decade ago. It is the modern interpretation of the responsibilities of guiding the destiny of a public service enterprise. To be sure, it is a strenuous existence; but it is the price of winning and retaining public confidence. The utility executive of today must operate his property efficiently as a matter of course, but that alone does not suffice; he must take time as well to be a citizen.

Effect of the Open Winter on Railway Earnings

RAILWAY managers look on the very open winter which the East has been experiencing during the last three months quite differently from how they would have done fifteen years ago. Then such a season would have been welcome because of the reduction in cost of removal of ice and snow from the tracks.

The same saving has been made by the electric railways this year, but the absence of snow has also encouraged automobile owners to keep their cars in commission throughout the winter. On most electric railways the consequent loss in gross revenues has greatly exceeded all saving possible in operating expenses by the absence of snow. This helps to explain the lower gross earnings of some companies during the present "freak" winter. They are in somewhat the same condition as the dealers in furs and other winter clothing.

It is interesting to note various corollaries of this effect of the weather on railway earnings. One is that if the storms during the early part of the winter are sufficiently severe to induce the average automobile owner to put his car in dead storage, a great many such cars are apt to remain out of active use until spring really has come. A single storm or two, however, will not drive the automobilist to cover.

Another factor is the effect when the state issues part-time automobile licenses. In some states, a lower charge is made for a nine-months' automobile license, such as one taken out in April, than for a twelve-months' license, or one taken out in January. Where this practice prevails, the automobile owner whose car has remained in dead storage during January and perhaps part of February without a license will often wait until April 1 before taking out his new plates, in order to save a few dollars. In the meantime, the electric railway company gets his patronage for six weeks or two months longer than it otherwise would. But if the automobile owner should take out his license in January, he is apt to keep his car in condition to run the rest of the winter.

Liberalizing the New York Savings Bank Law

GOVERNOR SMITH of New York has before him for signature a bill legalizing the investments available to savings banks by including provisions for the purchase of certain public utility bonds and railroad equipment trust obligations. The passage of the measure represents an effort of years, culminating in recommendations made to the present session by a special joint legislative committee entrusted with the responsibility of making constructive suggestions for the revision of the archaic statutes.

Now that is just what these statutes were. They were archaic. They were well drawn, in fact better drawn perhaps than those of any other state, except possibly Massachusetts, in the amount of protection they afforded for the funds of the small saver, but they took no account of the change of time—an element that has witnessed the great growth of electric light and power and railway industries. So far as the electric railways are concerned, their interest in the matter is only academic as the provisions of the measure, digested elsewhere in this issue, make plain, but the measure as passed does represent the advanced thinking of the day.

There is a plethora of money just now awaiting investment in substantial issues, but the changes in the law, if Governor Smith approves them, may be expected to work to the immediate advantage of the utilities, with the prospects that at some future date they may work decidedly to their advantage. The savings banks of New York are, of course, a mighty factor in their capacity to absorb investment issues of high character, but the problem of the past has been to find such investments in volume and still preserve the balance with respect to the various types of securities in which the funds were placed. The law as now amended should make the problems of the savings bank directors easier since it is estimated that $1,402,536,000 par value of light and power bonds alone will now go on the legal list, and unless money becomes still easier the change should tend to make it possible to preserve the present liberal rate of interest, which in most cases, certainly in New York City, has been 4½ per cent in recent years as compared with 3½ and 4 per cent not so long ago.

The Spirit of Levity in Montreal

CARELESS are the ways of man in little things. If this were not so there would have been no solemn conclave in Montreal recently to decide upon the disposition of a fund of $1,165,000 built up over a period of twelve years which represents money paid for lost or unused tramway tickets. Other companies have similar problems to deal with at times, but with them there is no occasion for comment at this time. With Montreal, however, the case is different.

When the franchise now in effect in Montreal was drawn in 1916, the fund which has grown to such proportion was negligible. If anybody thought about it then it did not make much impression. Weightier things were at hand. In consequence no clause was put into the operating agreement between the city and the Montreal Tramways providing for the disposal of sums so accrued. But the matter eventually became a poser. Even in this age of grandiose sums $1,165,000 is not to be regarded lightly. True, under the disposition now agreed upon and still subject to sanction by the tramway commission only 20 per cent goes to the company as profit.

Since Montreal is under service at cost there are ramifications to the disposition of the fund startling and none the less interesting as a subject of speculation. Because human nature is so frail, the Council has wisely impounded $500,000 of the fund against the possible presentation of lost or strayed tickets. It is just as well. Undoubtedly many of the tickets are not recoverable by their owners. For them they represent a dead loss. On the other hand, it is a fact that attention is being called to the more than $1,000,000 of transportation paid for which never was used. This may result in the search of

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the pockets of discarded or seldom-used suits of clothes and the unearthing of caches where tram tickets are likely to be hidden, perhaps along with unredeemed cigar coupons and other evidences of expenditure the only present tangible traces of which are printed slips whose values in the catalog are comparable with those quoted in the financial columns a few years ago for German marks.

To lay at the door of the people of Montreal the entire blame for the loss of $100,000 in tickets each year would of course be fulsome. Montreal has many visitors, but since information is lacking in the printed account as to just how much of this sum accumulated in recent years, it is impossible to tell what proportion may be chargeable to wanderers on pleasure bent, who in an excess of spirits have overestimated their transportation needs. Anyway, the tickets stand against the railway as a liability. In the patois of the street the attitude of their holders appears to be "What the deuce do we care," but this very indifference created a problem solemn men were called upon to consider.

There Must be Something for the Stockholders

HEARINGS have been concluded at Washington, D.C., on the proposal to consolidate the Capital Traction Company, the railway lines of the Washington Railway & Electric Company and the Washington Rapid Transit Company, which operates the local bus line. The proposal is not unlike similar ones made during the last twenty years, but it has gone farther in that a unification agreement has been drawn up.

Officers of the companies are agreed that the consolidation is advisable in the interest of greater efficiency and economy of management and for the benefit and advantage of the public and the stockholders. If it can be arranged, the consolidation would undoubtedly be all that those who subscribe to it believe it would be. But while the people in Washington insist that some such plan shall be carried out, they wonder wherein they are to profit. This is a natural human reaction, but no one can tell in advance except in terms of intangibles. The co-ordination of the three services should work to their benefit, but whether it would be possible to reduce fares is another matter. One thing is certain. The railways will have to raise fares if the consolidation is not put through. If, after the economies are realized that can be attained under the consolidation, it is not possible to reduce fares, the public of Washington would still be the gainer even if in a negative way.

As indicated in the JOURNAL for March 17 the two railways are willing to accept a valuation of $50,000,000 with a return of 7 per cent, although the value of the properties found in accordance with the rules of procedure laid down by the court is $62,000,000.

After all, the people of Washington must be brought to understand that any agreement for voluntary consolidation, to be feasible, must be mutually profitable. True, it must be in the interest of the public. But if stockholders are expected voluntarily to agree to a merger the plan must be not entirely against their interests. And the prospect for public benefits are much better under the plan now proposed than it would be with the companies continuing to operate separately.

Presidential Year Pessimists

MOST anything is likely to happen in a presidential year. This is a political axiom. And several things are happening. Perhaps the most significant is the cry raised about unemployment. That unemployment has increased in recent months there can be no doubt, but the situation is not so serious as some would have us believe. On every occasion such as this the old panaceas are trotted out as if nothing had been heard about them before. If the political idealists of one stripe had their way the government—federal, state or city—would at all times stand ready to buy all surplus labor. Whether or not it should similarly be ready at all times to buy surplus farm products is for the successor to the populist to say.

To go back only 30 years, it was the late E. H. Harriman, if memory is not at fault, who propounded the idea that in prosperous times the railroads should as a matter of economy and as a civic duty pile up their earnings so as to apply them and their borrowings to the carrying out of work in slack times. This in a way is just what the utilities are doing that have come forward recently with programs for extensions and improvements to be carried out at once. Among them are the United Gas Improvement Company with its $20,000,000 plan, the Cleveland Electric Illuminating Company with one of $11,600,000, the Public Service Corporation of New Jersey, the Northwestern Electric Company and the Virginia Electric & Power Company, to mention just a few.

It is, of course, well for governments not to compete for labor in a crowded market. But the whole matter has been gone over before, with notable thoroughness during the 1921-1922 period. But no such situation as existed then confronts the country now. To quote just one source, information available to the National Industrial Conference Board indicates that employment conditions in the country as a whole have been improved since December, even though public attention was not focused on the unemployment situation until late in January and in February. The present status of business and industry appears to be well indicated by the fact that record automobile production was established during February by practically all automobile manufacturers with the exception of Ford, that there was record steel ingot production during February, that new building contracts in February were 18 per cent greater than in February of last year, that bank debits of individual accounts were about 1 per cent more than in February of last year and that general industrial activity based upon electrical energy consumed was about 7 per cent over February of last year. Business undoubtedly is being transacted on a lower level of profit than during the similar period a year ago, but it remains true that the volume is at about the same level as the comparable time last year, or not far below the record peak of all times.

Despite the many favorable factors, however, conditions have been considered sufficiently propitious for General James F. Coxey, of Coxey's Army fame, to reappear, for J. Eads Howe, "millionaire hobo," again to put in an appearance and for Mr. Zero to harbor a few migratory guests at his "Tub" in New York. The hitch-hikers know what they are doing. They have picked New York as the greatest show town in the world. And the trick has worked.

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Building a
Better Transportation Service
for Kansas City

Comfort and convenience feature modernized service. Fleet of 45 de luxe cars used to inaugurate new service on a line a month. One-man operation rapidly extended

REHABILITATION of its street railway property was begun a year ago in a program launched by the Kansas City Public Service Company which has become of outstanding consequence, not alone on the score of a saving in operating costs to the property, but also because it has made possible a much improved street car service as expressed in frequency and car loading. This major rehabilitation program is regarded by the company as an investment in the city's future and as evidence of its confidence in Kansas City's continued growth and prosperity.

Involved in the work of rehabilitation has been a million dollar car rebuilding program, ultimate 100 per cent one-man operation of the modernized cars and an expenditure of another $2,500,000 for track improvement. By the end of 1928, there will have been spent for rehabilitation a total of $6,600,000. The decision to go to one-man operation of all of its cars was encouraged by the progress whch has been made in the design of improved control and safety devices for this type of operation and likewise by the very favorable operating experiences which have obtained since the adoption of a limited number of one-man, double-truck cars in Kansas City in 1919. In the opinion of the management the gradual extension of the one-man operation since that time has made possible the financial results achieved during the period of receivership. The company operated in 1926 a total of 9,287,000 one-man car-miles, or 38 per cent of the total. Had these one-man car-miles been all two-man operated, it is estimated that the additional expense would have been in excess of $500,000 per year.

Experience has demonstrated that there need be no material slowing up of schedules because of the one-man operation where sufficient additional service has been added to distribute the loads properly. Likewise, the accident record has proven better under one-man operation. This is attributed to improved mechanical features on the cars, and to the fact that the entire responsibility for the car operation is centered upon a single operator. As the outcome of the favorable results achieved there have been no protests from either the press or public authorities on the extension of one-man operation.

In inaugurating the new schedules, possible opposition on the part of the public to the one-man feature was avoided by the rehabilitation and improvement of equipment and by increased frequency of service with consequent relatively light loading per car. The public was given a service so superior to what had previously been possible that the advantages of one-man operation were quickly apparent. At the same time, an attractive differential in wage between one-man and two-man operation permitted trainmen to obtain a share in the economies effected. By stretching the period of installation of one-man cars over a sufficient length of time, the normal labor turn-over automatically compensates for the reduction in the number of men required to operate the cars. As each line is equipped with the rehabilitated equipment an increase of approximately 18 per cent is made in the non-rush hour service and 4 per cent in the rush-hour.

A newspaper advertising campaign is being run with advertisements appearing regularly four times a week in the Kansas City *Star* and the Kansas City *Journal-Post*. The copy, which is illustrated in accompanying cuts,

The improved service in Kansas City is being consistently advertised, using copy that calls attention to the rehabilitation of the railway property

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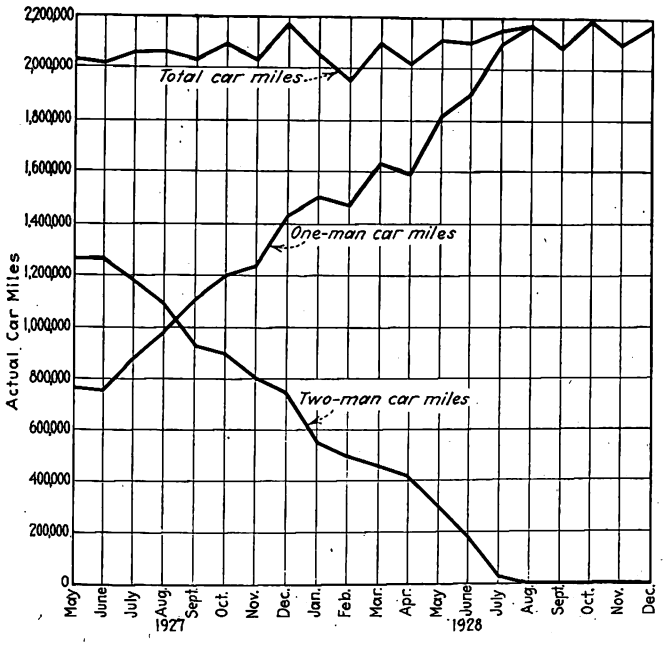
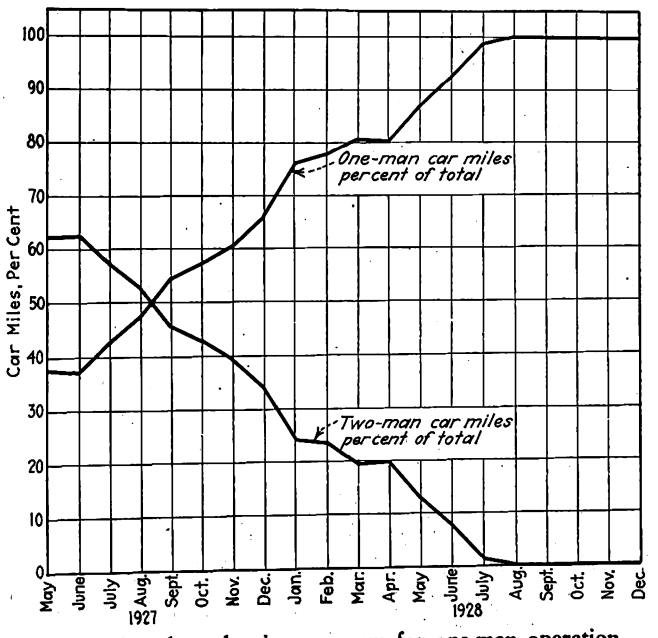


One-man car program in Kansas City showing actual car-miles operated one-man and two-man and progress of change



Progressive chart showing program for one-man operation in terms of percentage of car-miles operated

TABLE I—ONE-MAN OPERATION—CHANGE-OVER SCHEDULE 1927-28
SCHEDULE OF CAR SERVICE BEFORE AND AFTER NEW SERVICE INSTITUTED

	Lines	Date New Service Instituted	A. M. Before	A. M. After	Mid-day Before	Mid-day After	P. M. Before	P. M. After
1.	Country Club	July 3, 1927	32	39	15	17	37	43
2.	Argentine-12th Street	Aug. 7, 1927	31	37	15	18	33	39
3.	Brooklyn-Sunset Hill	Sept. 4, 1927	40	49	16	18	36	42
4.	Sixth Street	Sept. 4, 1927	8	8	5	5	8	8
5.	Independence Avenue-Rockhill	Oct. 16, 1927	32	37	15	18	33	40
6.	31st Street-Observation Park	Nov. 20, 1927	34	42	14	16	40	48
7.	15th Street	Dec. 4, 1927	18	22	8	9	17	22
8.	Central-27th Street	Jan. 1, 1928	36	44	12	14	38	46
9.	Northeast-Woodland	Feb. 19, 1928	31	38	13	16	36	43
10.	Troost Avenue	April 1, 1928	43	43	15	15	42	42
11.	Holmes-Quindaro	April 29, 1928	24	33	12	15	26	33
12.	Jackson-Roanoke	May 13, 1928	28	35	13	16	34	39
13.	Prospect	June 3, 1928	29	34	13	16	33	36
14.	Chelsea-Indiana	July 1, 1928	31	35	14	17	32	36
15.	Independence, Mo.	July 15, 1928	20	26	10	12	21	26

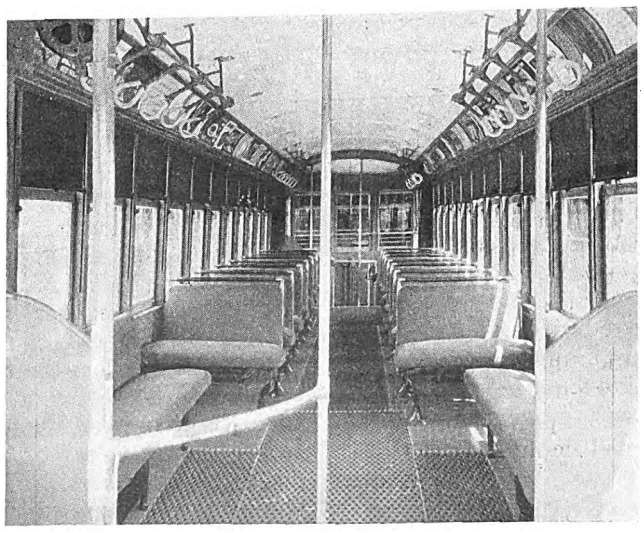
stresses the mutuality of interests between the community and its transportation system, and calls attention to the greatly improved car service which is being given.

A definite schedule calls for the introduction of the modernized cars on about a line a month. In preparation for the extension of one-man operation it was necessary to give the trainmen special training. Men who had been regularly employed as conductors on the two-man cars were moved up to the front platform to work with their motormen as tutors, while men from the extra list replaced and performed the duties of the conductors. This was followed, in turn, by the transfer of the motorman to the rear platform to become acquainted with the conductor's duties. This latter training required only a very short period. Practical instruction of this type was followed by training school work and by operation of one-man cars under the direction of an instructor or supervisors. As shown in the accompanying table, nine lines have been changed over to the new service to date, with six remaining to follow at intervals of about a month.

As the one-man service was introduced on each line it was found advisable for the first few days to augment considerably the number of regular street fare collectors on that line. During the initial period on a new one-man line, men are placed at every important loading point during the rush hour. Their duty is to direct passengers to the proper car entrances, assist them on and off the car, and in other ways explain the new operation. These extra men are used until riders appear thoroughly conversant with the new system.

To facilitate the introduction of the new service, traffic directors are also placed on duty inside the cars. They pass out pamphlets which detail the improvements in the modernized cars. These men assist in no way with the actual operation of the cars and as the public becomes familiar with the service, they are withdrawn. Usually, four days to a week has been found sufficient to insure smooth operation of the one-man service on a new line.

To encourage patrons to give the new service a trial and to inspect the improved cars as they are introduced the Kansas City Public Service Company carries passengers free between certain hours on the first Sunday of the new oper-



Composition rubber removable aisle strips and upholstered seats are used in the rehabilitated Kansas City cars

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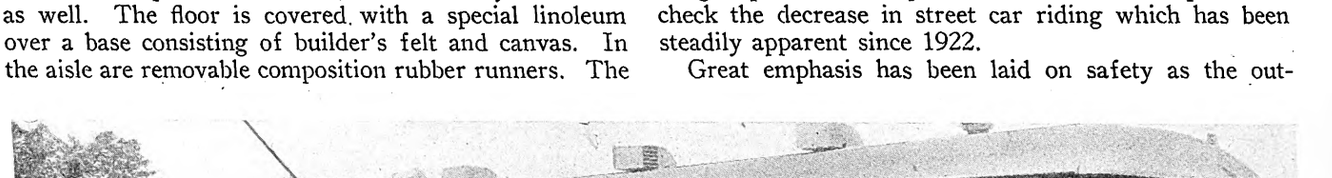
ation on each line. To inaugurate this service a group of 45 light-weight, double-truck cars, purchased in 1916 and 1917, were completely rebuilt in the company's shops for the specific purpose of introducing the modernized car service on each of the fifteen city lines in succession. In these cars it was the object to show what can be done to make a street car not only an efficient transportation vehicle, but distinctly attractive as well. The floor is covered with a special linoleum over a base consisting of builder's felt and canvas. In the aisle are removable composition rubber runners. The vestibule floors are covered with a metal insert rubber flooring which even in bad weather when ice and snow is carried in, can easily be kept clean. These cars are equipped with skirts on the outside—lined with Celotex. The skirts give a stream-line effect to the cars, are considered to improve the general appearance, and, together with the floor inside, tend to minimize truck noises. A visor on the front of each car protects the operator's eyes from the sun glare, and increases the visibility in case of rain or snow by protecting the upper part of the window.

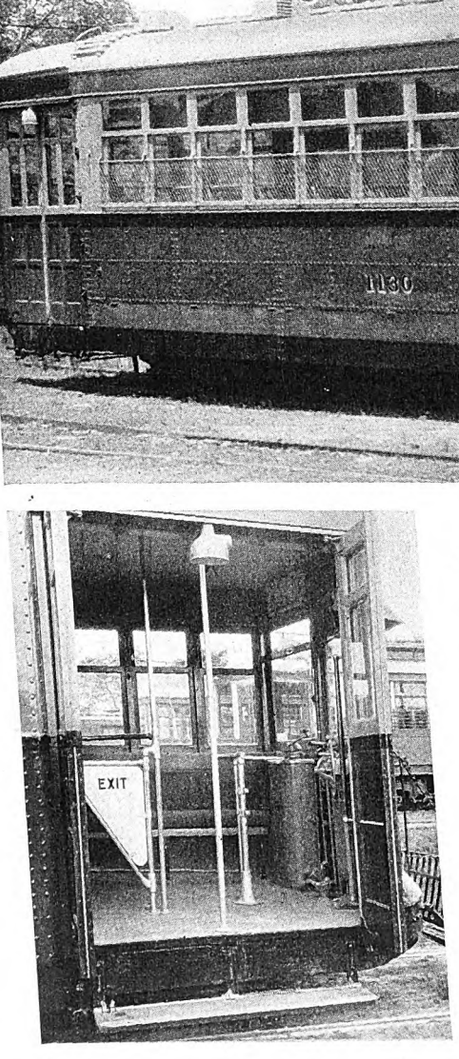
The 45 cars are completely equipped with safety devices, and in addition have upholstered seats and stream line painting. They are shifted from line to line to introduce the change-over to one-man operation and are then replaced with other rehabilitated cars after the new service is operating smoothly.

Attention is being given to making all rehabilitated equipment comfortable, attractive, and modern, by using new flooring, new ventilators, seat covers and attractive painting. In addition to making some reduction in operating expenses the improved schedules are expected to check the decrease in street car riding which has been steadily apparent since 1922.

Great emphasis has been laid on safety as the outstanding consideration in the operation of the new cars. A distinct effort is being made to gain the absolute confidence of the riding public. In the rehabilitation of the cars no features have been overlooked that in the opinion of the management can contribute to safe operation. The program covers the complete overhauling of motors, trucks, car bodies, controllers, heaters, wiring, piping, and all car appliances, and the addition of many new features such as safety air, folding doors, rear treadle doors, line breakers, back-up control, Economy meters, thermostats, new ventilators, air rectifiers, exit gates, weather stripping, etc.

All cars are being repainted and refinished inside and out, the new color scheme having been worked out by the

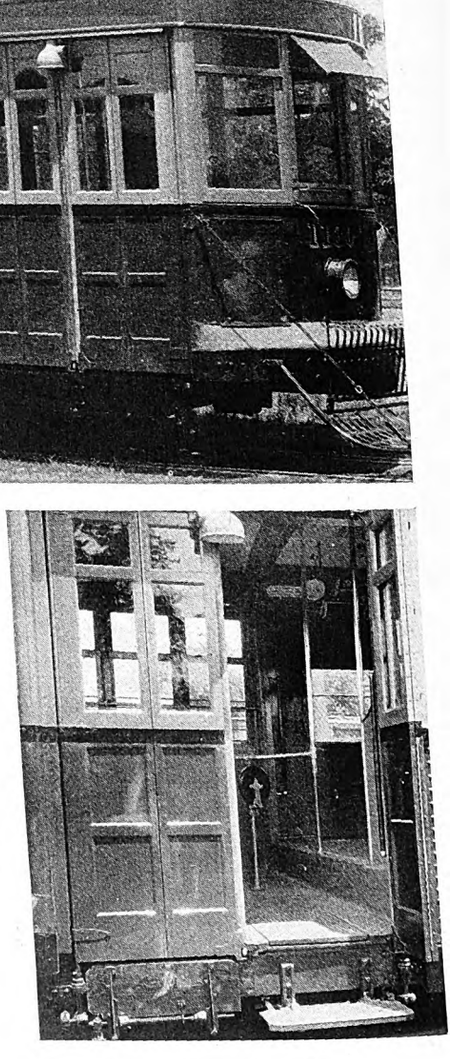




Above—General appearance of rehabilitated Kansas City cars. Comfort, attractiveness and safety were the objectives sought in this work

At left—Pneumatically operated folding doors and a swinging exit gate were installed at the front end to guide boarding and alighting passengers

At right—An automatic treadle door is used on the rear exits of the cars to relieve congestion at the front end



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Kansas City Art Commission. The general scheme calls for orange and apricot on the outside, trimmed in plum with gray roof. The interior finish is a light drab-green above the arm rails, with a darker shade below. The ceiling is white.

All cars are being equipped for one-man, two-man operation, similar to the earlier 1,400 type on Troost Avenue, but with additional features such as treadle exit doors that make handling the loads much easier and give the public more conveniences.

Practically all cars are to be equipped with safety air equipment. Single sliding doors are being changed to double folding doors. The advantages claimed for the folding doors are that as both halves operate at the same time, quicker operation is obtained, and a greater total door width is available for both loading and unloading. National Pneumatic door equipment and treadle operated exit doors are being installed on all cars equipped with safety devices to permit passengers to alight at the rear of one-man operated cars.

The necessity of wyeing cars has been a source of accidents on single-end equipment. In backing cars under such conditions the operator's vision is limited. Consequently, a back-up device is being installed, by which the operator can control both power and air brakes from the rear vestibule of the car at will. Control of power is obtained by a dual line breaker control circuit with a push button on the rear platform. This circuit is operative only when the normal breaker control switch in the front vestibule is thrown to the rear control position. In normal operation the circuit is open and the push button in the rear vestibule is dead. Air brake control at the rear end is obtained by a straight air valve installed there.

All cars have been equipped with Economy meters during the year 1927. These are connected so that only the energy used by the motors is measured. The energy used for lighting, heating and air compressors is not measured. This arrangement was agreed upon in order that the transportation department could institute a competitive system of energy savings among the operators and eliminate the variables due to compressor, light and heat consumption. Spring Gruv weather strips are being installed on window sash to eliminate rattling and to make them easier to open and close in damp weather.

Accident Record Improved

A comparison of accident figures for the past two years on seven divisions of the company's property is afforded in the accompanying table. It is to be noted that the total accidents now charged to the motorman-operator includes types formerly charged to the conductor. Should the present record continue, it is anticipated that one-man operation will show a decided decrease in accidents.

TABLE II—COMPARISON OF ACCIDENT RECORDS 1926 AND 1927

Year	No. operators having no accidents	No. operators having accidents for which not held responsible	Car collisions	Vehicle accidents
1926	65	210	123	5,011
1927	50	220	104	4,997

Labor turnover for 1927 was comparatively normal; in fact there was a 5 per cent decrease in comparison with the preceding year. Yet, in the face of an unexpected declining turnover in labor, it was found possible to introduce one-man operation on one line a month of the fifteen lines on the property and at the same time to hold down to a small number, the active men transferred to the extra lists.

TABLE III—COMPARISON OF LABOR TURN-OVER 1926 AND 1927

Year	Per Cent turnover	No. men hired in Transportation Division	No. men who left service
1926.....	22	309	327
1927.....	17	59	271

Since May 10, 1927 no platform men have been hired.

Summarizing briefly the physical accomplishments to date in the establishment of the modernized street car service in Kansas City, 332 street cars have already been rebuilt up to the first of the year in the shops of the company on a production basis which is continuing to turn out two reconstructed cars a day; nine lines have already been turned over to modernized car operation, the last one of this group having been transferred Feb. 19; and 575 men in the period from June 1, 1927, to Jan. 1, 1928, have completed instruction in one-man operation.

Holds Up Electrification

Committee appointed by the Austrian government to study the financial and technical problems involved

WHEN the present electrifications of the Austrian steam railways are completed no further work will be done for at least some time. This was announced during the latter part of last year by the Austrian government, whose railway system is owned by the state but is independently managed. The railway authorities said that they wanted to see whether the financial results on the existing system warranted further electrification. Among the routes affected by this decision is the trunk line from Vienna to Salzburg which carries the densest traffic of all Austrian lines.

The most serious handicaps to Austrian electrification are the low fares required by the country's economic condition and the high rate of interest which has to be paid on loans required to finance the change. The railway authorities estimated that owing largely to these two factors, the electric operations of the Vienna-Salzburg line would show an annual deficit of approximately $1,200,000. Other arguments against a change are recent improvements in steam locomotive design, resulting in less fuel consumption, and the lower prices for coal in effect at the present time.

According to the European technical press, this decision has met with considerable criticism from various sources. The manufacturers of electrical machinery, expecting more orders for equipment, have considerably enlarged their production facilities and quite naturally are opposed to any decision to stop the electrification. The official figures of estimated loss have been attacked and Professor Seefehlner, a well-known expert in railroad electrification, has published an estimate that instead of a loss there would be an annual profit of $952,000 from the Vienna-Salzburg line for electric over steam operation. The four big electrical manufacturing concerns have offered in a joint bid to take over the whole

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work at a fixed price so that it would not have to be done by the railroad's own forces.

The latest development in this matter is that the Austrian Parliament has authorized the government to appoint a committee of experts to conduct an extended investigation into all the questions involved.

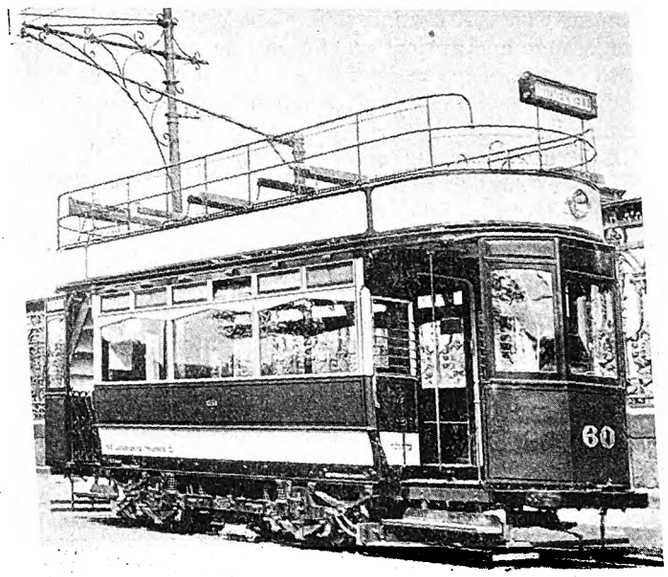
The Vienna-Salzburg line is a very important link in the railway system of Central Europe and connects the western countries like France and Switzerland with the Balkans and points farther east. To meet the needs of complete electric operation, from 138 to 152 locomotives for through service and from 20 to 22 motor cars for local service will be required. The plans call for five substations, each with a capacity of from 3,000 to 7,500 kva. to supply about 94,000,000 kw.-hr. annually. The electrification of this line would save the necessity for the import annually of some 300,000 tons of coal required under steam traction, since ample energy can be developed from available water power.

Light-Weight Double-Deck Car for Scottish Tramway

By G. F. Moller
Bothwell, Scotland

ENGINEERS of tramways in England for some time have been endeavoring to produce a light-weight car to meet omnibus competition. The double-deck car is still in almost universal use in Great Britain, so it is not surprising to find that with the exception of the Bradford high-speed, worm-driven car developments in British cars have been with the double-deck type.

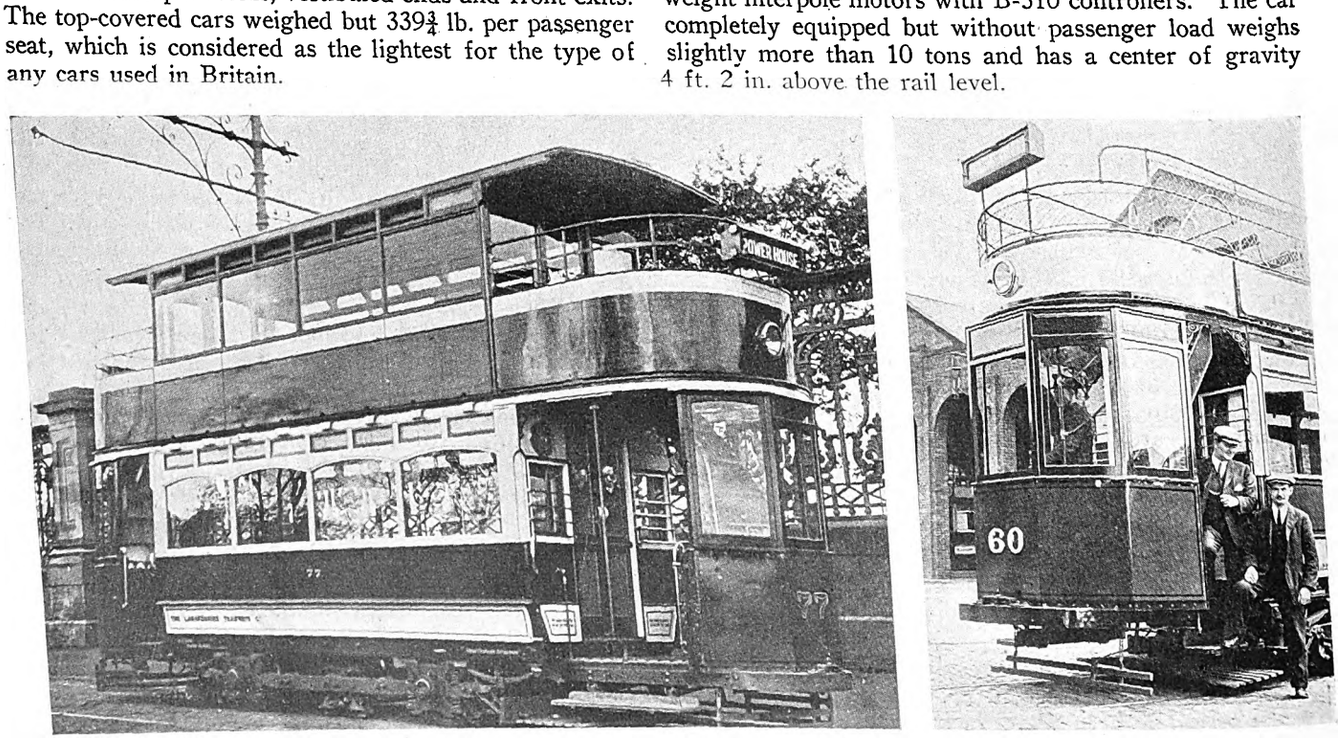
To meet present-day traffic requirements the Lanarkshire tramway system, which is a suburban line linking several large towns to the east of Glasgow has remodeled some of its existing cars to produce a new design of top-covered vehicle. The remodeled equipment was provided with extended platforms, vestibuled ends and front exits. The top-covered cars weighed but 339¾ lb. per passenger seat, which is considered as the lightest for the type of any cars used in Britain.



Type of car before remodeling with open upper deck.

The underframe structure is of oak, the side sills having 6-in. x 4-in. sections, reinforced with a 5-in. x 3-in. x $\frac{5}{16}$-in. rolled steel angle. The body framing is entirely of teak with the exception of cant rails and fence rails. In the lower saloon the pillars are secured to the underframe by special malleable iron brackets. Adjustable truss-rod brackets are used. Deep section longitudinal rails are employed, the waist rail being 5 in. deep, while the light rail is arched over the side windows and has a shoulder 7 in. deep on the pillars.

Car bodies constructed according to this design have given excellent results in service despite the poor condition of the track in several of the routes over which they are operated. Roller bearings are employed for both journal and armature bearings. The electrical equipment consists of two 35-hp. British Thomson-Houston light-weight interpole motors with B-510 controllers. The car completely equipped but without passenger load weighs slightly more than 10 tons and has a center of gravity 4 ft. 2 in. above the rail level.



Double-deck car with inclosed upper deck. End-inclosed vestibules are provided

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Terminable Permits
Are Proving Their Worth

The plan is much to be preferred to the old-time franchise. This is the opinion of the author, expressed to the members of the Illinois utilities associations at their joint meeting at Springfield, March 14-15

By E. R. Dillavou

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SIMPLY defined, a local franchise is a permit to use the public streets for the purpose of rendering some public service thereon. There are those who still cling to the idea that it constitutes a gift of untold value. But subjected to effective regulation combined with a true appreciation of the purpose of a public utility on the part of the operators, utility service no longer opens an unusual opportunity for profit at public expense.

The local franchise has had a somewhat varied history. At first the tendency was to issue perpetual grants. This was followed by another period in which it became customary for the legislatures to limit the period for which a franchise might be issued. Provisions were inserted having for their purpose the control of rates and service during the franchise period. Because of the rapid development of the arts and various changing conditions, it soon became impossible to prophesy the future with any degree of accuracy. To meet this difficulty the tendency was to shorten materially the franchise period. This failed to remedy completely the defects in such a scheme of regulation, and from about 1907 to 1913 statutes were enacted in various states creating public service commissions, whose duty was to regulate the public utilities in accordance with the general provisions of the act. Thus, if the short-term franchise was ever a necessity as an aid to regulation it is a certainty that its usefulness expired at that date.

The short-term franchise imposed an exceedingly grave handicap upon utility financing. Investors were unwilling to place huge sums of money in an enterprise unless some provision was made for their repayment at or before the expiration of the franchise. As a result money needed for extensions and improvements often was not obtainable; the ultimate effect was reflected on service. As the franchise neared its end no investor was willing to tie up large sums of money in permanent improvements, when no assurance was given of continued life beyond the franchise period.

Furthermore, the temptation was ever present on the part of the public utility to disregard service, in order that a reserve might be accumulated to amortize the loss in the event a new franchise failed to materialize. To this extent the rate paid was higher than it should have been for the service received. In addition, numerous political upheavals and disturbances were certain to break out during new franchise years. Some of the states amended their laws, so as to place no limit on the franchise period, others adopted terminable permits, while the balance still retain limitations for at least some, if not all, of the utilities.

Principle of Terminable Permit Not New

There is nothing novel or complicated about a terminable permit. It is a franchise which continues indefinitely, unless the utility is purchased by the municipality, or unless the permit is canceled because of misconduct on the part of the company. Such a permit seems to remedy the evils of the short term franchise and, at the same time to protect the public interest, particularly since a public utility is subject to regulation by a state commission. The investor, having faith in the behavior of the management, and realizing that his money will be repaid if the city sees fit to terminate the permit, is ready to supply money from time to time as the progress of the business demands it.

Why is it that the use of the terminable permit has not become more universal? It is customary to state that there are nine terminable permit states, while as a matter of fact in only six of these can it really be said to exist, and in some of the six only certain classes of utilities are entitled to its benefits. The answer lies in a consideration of at least two important problems. Whenever the various interested parties are able to agree on the type of terminable permit law to be enacted and the kind of regulation best adapted to its use, the way will be open for their general adoption.

One of the most important problems confronting any municipal body at the time a franchise becomes necessary is: What duties shall be imposed upon the utility, or what terms shall be inserted in the permit? As the utility takes on a life of indefinite duration, the question becomes doubly important. No utility desires to burden itself, or its customers, with heavy obligations for an indefinite period. On the other hand, municipalities seem most unwilling to surrender this last vestige of control over the local utilities. As a result, wherever term franchises still exist we find various onerous conditions imposed upon the utility in favor of the municipality.

Four possible solutions of this problem have been suggested by the laws of terminable permit states. The laws of Louisiana, which limits the use of such permits to the city of New Orleans, allow the municipality to

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insert any conditions which may be agreed upon at the time the permit is issued. Oklahoma provides that all new franchises must be for a definite term, but they may be surrendered, at the option of the utility, for terminable permits which embody the terms of the surrendered franchise. The Massachusetts law makes it possible for many of the utilities to have all duties commuted into an annual money payment. Wisconsin is illustrative of a group, the law of which reads that the permit shall be held "under all the terms and limitations of this act." The courts have construed this to mean that each permit is to be like every other permit, the consequence being that all burdensome provisions are eliminated and no new ones may be added.

A clear appreciation by the public of the effect of such burdens might help to solve the problem. Under our theory of regulation, it is clear that the cost of these burdens enter into the rate and become an indirect tax levied upon the consumer. This tax is one which benefits all taxpayers alike at the expense of utility users. A universal recognition of this fact would soon spell the end of such provisions.

Who Is to Regulate?

Perhaps the greatest stumbling block in the path of universal use of the terminable permit is the dispute which continues to rage over which arm of the government is to regulate—state commission or municipality. In Louisiana municipalities are in complete charge, while the other extreme is typified by Massachusetts which has strict regulation by a state commission. The other states fall somewhere between these two extremes. In this connection Indiana and Wisconsin have hit upon a division of authority between the two bodies. In Illinois at present, the practice is the same as that in Massachusetts. All phases of the regulation problem are handled by the state commission. A brief consideration of the Wisconsin scheme of division of authority appears desirable. The following suggestions are in support of this plan.

Uniform accounting procedure, which has been established by the state commission has proven of immense value to both the public and the utilities. It has made possible intelligent and valuable comparisons, and, thus, has proved a great aid in ascertaining the relative efficiency of different companies operating under similar conditions. It has helped to clarify for utility operators some of the problems existing before a well defined procedure was adopted. Clearly the control of accounting procedure must rest in the hands of some central authority.

The same may be said for control of security issues. Security issues are sold throughout the state and often a particular issue is secured by property to be found in many distant communities. Any proposition calling for control of them by the municipalities is absurd. The credit of utility companies can only be maintained when security issues are approved by some central authority entrusted with their strict supervision.

State commissions have been criticized most severely by proponents of local control because of their attitude on rates. These proponents maintain that the foremost purpose of any regulatory system is to see that good service is rendered at the lowest possible rate which is consonant with justice to all parties concerned. They contend that this objective has not been attained by state commissions. The rates are too high, they urge, because of exorbitant valuations and excessive operating expenses. The implication is left that local control will remedy the defects, although more often than not, definite procedure for doing so is lacking.

Occasionally the criticism has been well taken, but I believe in most instances it has been misdirected. Take, for example, the matter of valuation. Undoubtedly, many state commissions personally favor a different method of arriving at a rate base than that adopted by the Supreme Court of the United States. Yet, in the face of the decisions of the federal courts they are helpless. Occasionally the utility operators have, I believe, been guilty of making unreasonable and economically unsound demands. Particularly has this been true with certain of the intangible items. There also are those who criticize severely the use of reproduction cost as a basis for rate making. But even assuming that the majority of valuations are too high, which is still open to proof, it is not at all clear how local control proposes to relieve the situation. The companies will be subject to the jurisdiction of the same courts. The same fundamental principles for determining a return must be used by the city that the state commission has been compelled to adopt.

The second objection to rates granted by a state commission is said to arise from excessive operating expenses. It is said that this results from the lack of any special incentive or inducement offered for efficient management. That too often a utility is given a definite rate of return, without considering adequately its operating efficiency is unquestioned. Any saving resulting from increased efficiency between the rate hearings belongs to management. Therefore, particularly among the large companies, emphasis is constantly being placed on low cost of production and an extension of the utility into new fields of endeavor, in order that added return may be obtained. Furthermore, many of these companies, evincing a realization of their public calling, are voluntarily dividing these profits with the consumers through reduction of rates. It is in such cases that management truly realizes the function which the government permits it to perform. Because some managements do not entertain a high regard for this public trust there is some strength to the criticism. Much could be done by state commissions in working out definite plans to encourage decreased operating expenses by offering a reward for reduced rates. Although municipalities are prone to criticize existing conditions, no definite improvement has been suggested by them.

Two additional reasons are suggested why state regulation of rates is desirable. First, many of the municipalities are financially unable to engage the trained technical help required to solve the rate problem in an intelligent manner; second, the municipality is an interested party in at least two respects. It is itself a user of utility service; and, in addition, the municipal officials represent directly the consumers and form a part of that body. Sound reasoning certainly demands the establishment of rates by some unbiased third party. The state commission seems to fill most acceptably this need.

Service Regulations Differ

It is in the matter of service that we may be inclined to disagree and where Indiana, Minnesota and Wisconsin have departed from Illinois. The State of Illinois has gone to extremes in holding that all matters which in any possible way affect service fall within the purview of the Commerce Commission. The Supreme Court in the Atwood and Northern Trust Company cases held that the municipality had been robbed of its power to regulate

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at grade crossings and to control such matters as headlights, speed of cars, and the like within the city.

It seems quite evident that matters of police regulation, which affect primarily the physical comfort and safety of its citizens, should rest absolutely with the municipality, even though such ordinances relate to public utilities. Unless some general order of the commission is contravened, the ordinance should be respected.

It is, however, in the matter of the more general control of service that these states depart so radically from others and to which more detailed consideration must be given. There are two distinct phases of service. One relates to the establishment of standards, while the other concerns itself with extension of service. In the matter of standards, these states have granted to the municipality original control, with the possibility of an appeal to the state commission if the utility deems the orders unreasonable. The municipality rules supreme where the problems of extension are involved. Only intervention by some court can interfere with municipal orders issued therefore.

Two Reasons for Local Service Control

There are two rather pungent reasons favoring local control of service; first, the consumer, taken as a group, is entitled to the service his taste calls for, if he is willing to pay the price; second, the extension of service is essentially a local problem and is inextricably interwoven with municipal development. In support of the first contention, I feel that municipal officials are more attuned to the needs and desires of their constituents than is true of an outside body. A busy state commission should not be forced to familiarize itself with an already well-known local demand. Limited only by a willingness on the part of consumers to pay an adequate rate for the service requested, municipal control of service standards appears desirable. Certain difficulties may arise where one operating company serves numerous communities. In an absence of an agreement among them, where different standards are not available because of the uniform nature of the service, some provision for an appeal must be made.

Regarding the second point, it is common knowledge that the orderly development of any city is dependent on the extension of various classes of utility service. A city planning commission cannot function, zoning ordinances cannot be enforced, and paving of city streets must be delayed unless the utilities co-operate. Definite programs relating to municipal development can only be formulated with any degree of assurance of execution when public utility service can be relied upon. By placing the control over extensions in the hands of the body which is directly responsible for the progress of the community, the difficulty is solved. Development of any section of the city is certain to be accompanied by the needed utility service.

In addition, I believe that by placing control over service in the hands of municipal officials, there will evolve a more pleasant and wholesome co-operation. Many problems must of necessity be worked out in harmony with city officials. By delegating to them regulation over service, I feel that a friendlier spirit of co-operation would be certain to prevail. Certainly the replies received from both cities and utilities indicated that municipal and utility relations had greatly improved with the advent of the terminable permit into Indiana and Wisconsin.

There are other matters of importance, such as the surrender of existing franchises, who is to issue the permit, provisions for termination and others, which deserve consideration. In conclusion, merely allow me to make one additional observation. The advantages of a terminable permit apply with equal force to all utilities. At present the street railway industry in Illinois is particularly handicapped by twenty-year franchises. Nevertheless, other utilities are in many instances compelled periodically to bargain for continued existence. A terminable permit law should apply alike to all utilities. The benefits are certain. Neither the investors nor the consumers should be deprived of the advantages which are to be derived from the use of terminable permits.

$200,000 to Improve Philadelphia Cab Maintenance Facilities

IN LINE with its policy to supply the cleanest and safest cab equipment possible, the Yellow Cab Company, affiliated with the Philadelphia Rapid Transit Company, is constructing what is believed to be the largest cab maintenance shop in the world, at 812 Schuylkill Avenue. This shop will have a capacity for handling the entire mechanical maintenance of a fleet of 1,500 cabs.

The Schuylkill-Catharine, or K-T garage, as it is called, is located at Schuylkill Avenue and Catharine Street. A P.R.T. way department shop formerly occupied the adjacent premises at 812 Schuylkill Avenue, and this building is being thoroughly remodeled to meet the needs of the cab maintenance organization. It is planned to have the mechanical equipment ready in 1928.

All cabs on the system will be cleaned, inspected and repaired at this new shop. At regular two-week intervals each cab will be sent to 812 Schuylkill Avenue for a 24-hour stay. The salesman who is driving the cab on the particular day of its appointment with the laundry and dispensary will drive his cab to the Schuylkill shop rather than to its home garage at the end of the day. The cab will first be thoroughly cleaned and washed. It will then be carefully inspected to insure first-class mechanical condition. Any repairs and adjustments will be made at once. A force of shop drivers will return the cabs each night to their home garages. "Trouble shooters" in each garage will, however, make minor repairs necessary between the times of regular inspection.

The cab washing and repair apparatus will be the last word in cab maintenance equipment. A lacquering machine will be installed to add the finishing touch of polish and shine. With the completion of this work and the centralizing of the garage mechanical departments it is expected that the number of street disablements will be materially reduced, and that the cost of keeping the cabs in good operating condition will be considerably lowered.

The operating offices of Yellow Cab, now located at 1734 North Broad Street, will be moved to the second floor of the new shop the latter part of November or the early part of December. In addition, the stores department for all garages will be located at 812 Schuylkill Avenue. The instruction department for new salesmen, their classrooms and the uniform room will also occupy a section of the second floor. In fact, the whole Yellow Cab organization, with the exception of the executive offices, the traffic department and the four garages, which then will do little more than house the cabs, will be combined in the new quarters.

This new project will cost approximately $200,000.

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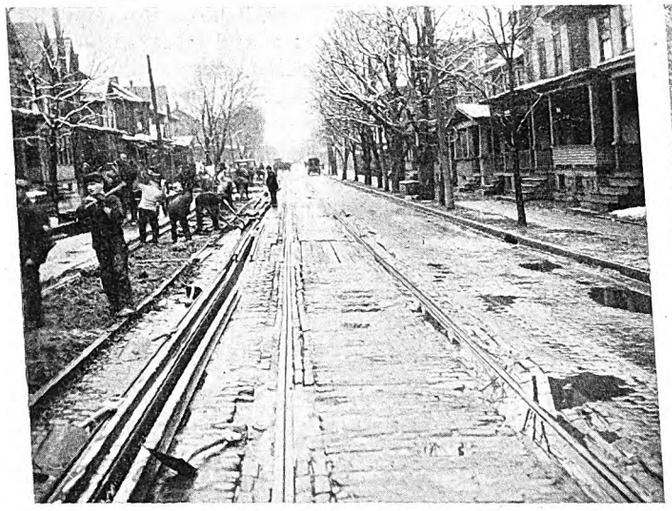
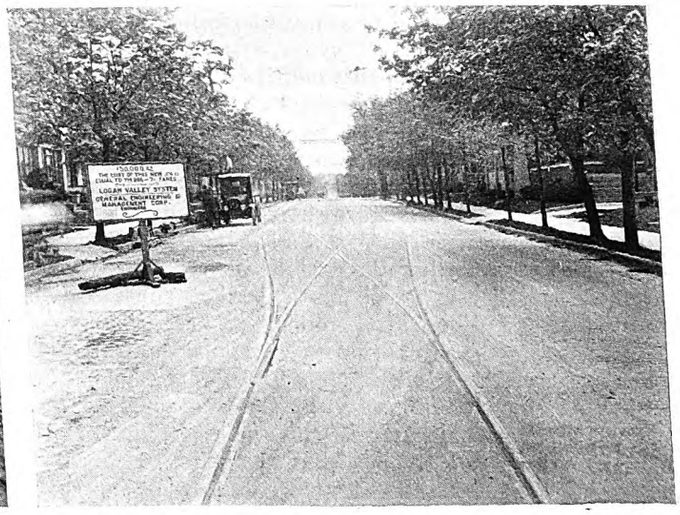
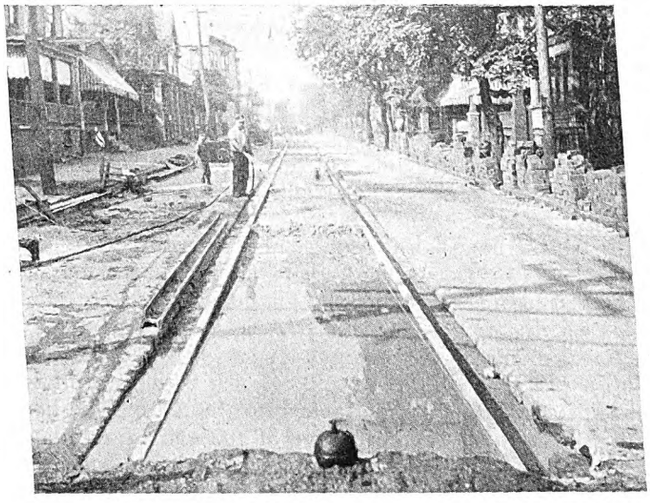


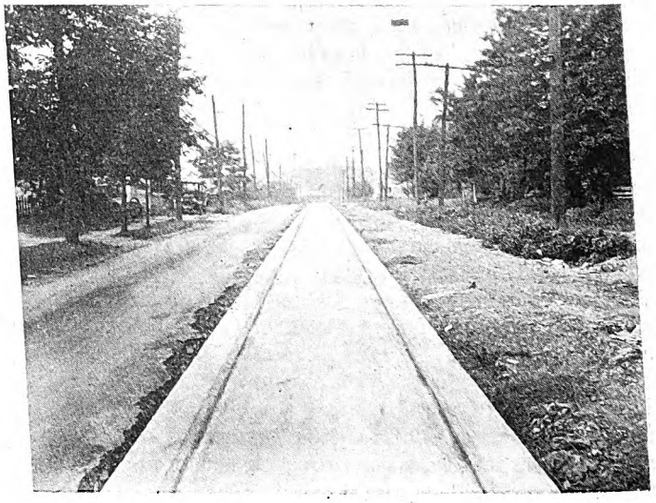
One of the stretches of track that was rehabilitated. In this view the temporary track is being laid alongside preparatory to tearing out the old track so that the service will not be interrupted



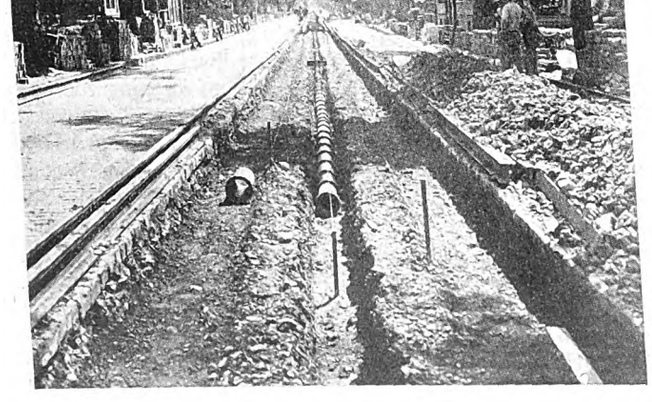
This view was taken 37 days after the previous one, with the new track completed and in service. The sign at the left of the street indicates one of the publicity methods adopted by the company



Curing the concrete on one of the stretches of new track constructed by the Altoona & Logan Valley Electric Railway in its 1927 program



On some of the suburban lines the company has placed the track in paving in preparation for a later paving program of the city which may be carried out this year



On account of the marshy soil in Altoona tile drains were laid under all of the tracks. This view shows a standard type of drain under the center of the track

Where compromise joints were necessary in changing from one section of rail to another steel sole plates were welded to the rails, with filler plates to give a firm footing to the low rail

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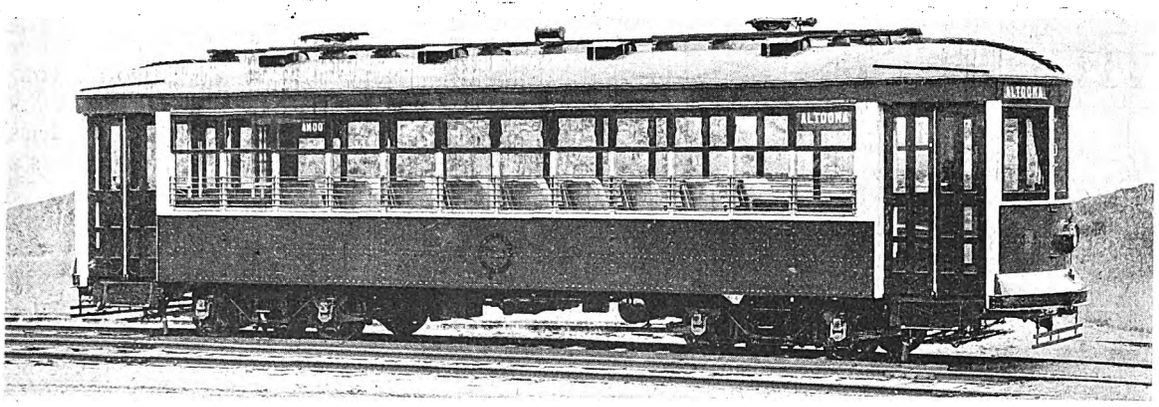


One of the double-truck safety cars purchased by the Altoona & Logan Valley Railway in its modernization program

Altoona Modernizes

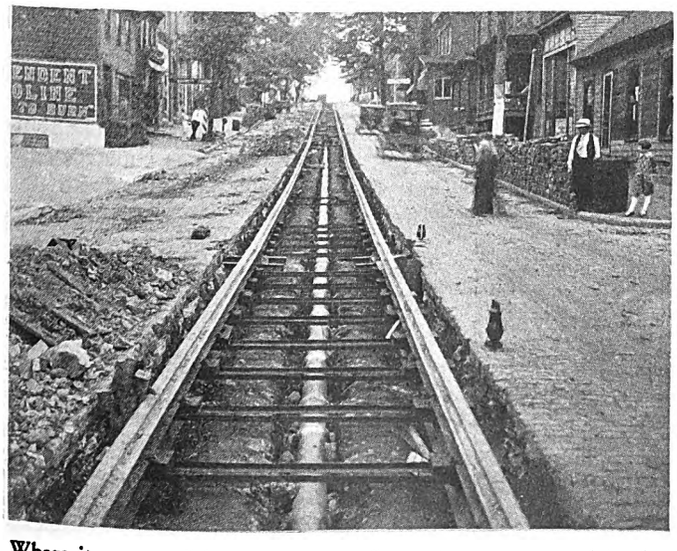
on a Three-Year Program

Expenditures made after careful analysis to put Altoona & Logan Valley Electric Railway and Logan Valley Bus Company properties on substantial basis

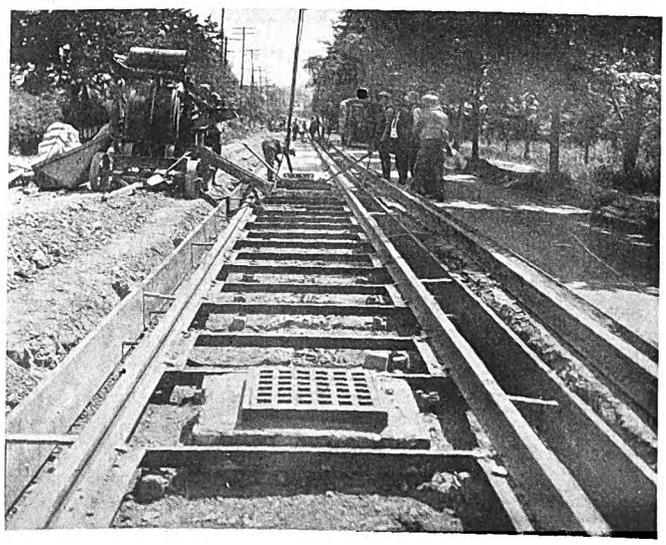
DURING the past three years the Altoona & Logan Valley Electric Railway and the Logan Valley Bus Company have spent more than $1,000,000 for new track and equipment and an additional $650,000 for maintenance of track and equipment.

The extensive program of improvements has been carried out by the railway and its bus operating subsidiary, serving Altoona, Tyrone and Hollidaysburg, Pa., and vicinity. There are 56 miles of rail lines, 26 miles of which are in paved streets, and 40 miles of bus routes. More than $500,000 was spent for new track, paving and under drains, more than $270,000 for safety cars and safety equipment for remodeled cars, and more than $93,000 for buses, a new garage and garage equipment. This paper has carried the news of these various projects from time to time as the work has been announced. The total amounts are given in accompanying tables.

In the paved streets two types of track construction were used, depending on whether it was possible to reroute the traffic. Where the traffic could be diverted to another route during the reconstruction steel ties were used. Both Dayton and International ties were laid. Several of the pictures illustrate the progress of track laying. Track drains of 6-in. to 8-in. diameter, with catch basins or manholes every 350 ft., were in-



Where it was possible to reroute traffic steel ties were used in the reconstruction work. This view, taken on Allegheny Street, Hollidaysburg, shows the use of Dayton mechanical ties



Another stretch of reconstruction work where traffic could be rerouted shows progress of the work. International steel ties were used on this job

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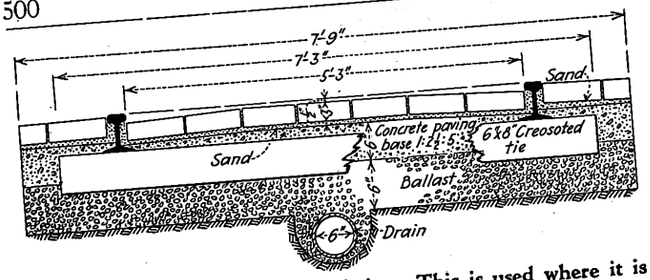


Standard type of track with wood ties. This is used where it is necessary to lay the track under traffic

stalled under all new track in paved streets on account of the marshy condition of the soil.

Where it was impossible to divert the traffic the track was laid with treated pine ties. The form of construction is shown in the line illustration. The ties are 6 in. by 8 in. by 7 ft. 3 in. long. First 6 in. of ¾-in. clean stone ballast was tamped and flat rammed by air under and around the ties. Then a layer of 1:2½:5 concrete 6 in. to 7 in. thick was laid for a paving base. On this a ½-in. sand cushion was spread to carry the 3-in. wire-cut lug paving brick. All the rail used for track in paving was of 100-lb. ARA-A section, except in a few special locations where Lorain section LS-122-491 girder rail was used. All the joints were fitted with sole plates and were seam welded.

During the three years in which this modernization program was in progress the company expended $201,596 for street paving or $67,199 annually. With an average daily service of 48 cars this would amount to $1,400 per car per annum paving tax, the company states.

To do the rehabilitation work there were purchased and placed in service one resistance type welder and one motor-generator type welder; two air compressors, one of which is electric driven and one gasoline driven, the latter being mounted on a Ford truck chassis; a set of tie tampers, flat rammers, concrete breakers and other track tools.

All the track in paved streets in which low joints and broken rails had developed was gone over and repaired. Joint repairs were made by installing sole plates, seam welding, surface welding and grinding, tamping four joint ties with dry concrete and relaying paving on the concrete base. Where the ties were cut or rotted under the joints they were cut out and joint boosters installed. Compromise joints are all being built up with plates and welded as shown in one of the illustrations.

In the open track all the joints were gone over, the broken plates were replaced, the bolts were tightened and the broken bonds renewed. The track was surfaced and lined. In the 25 miles of open track 25,000 ties were renewed.

During the past year particular attention was given to the overhead lines. An inspection was made of all the poles and trolley wire. The pole lines were renovated, the crossarms renewed and the wires rearranged. Bad stretches of trolley wire and heavy-duty curves were renewed. Worn splicers and ears were replaced. In doing the work 11 miles of trolley wire and 600 poles were installed. Since the work has been completed interruptions from line breaks and broken poles have been reduced about 70 per cent.

Fifteen sets of two-wire Nachod automatic car-counting signals were installed for city service and fourteen miles of telephone line were built for despatching cars in interurban service.

Thirteen steel-body, light-weight, double-truck safety cars of the latest type and three Birney safety cars have been purchased to give better service and to stimulate new business. One of the double-truck cars is shown in an accompanying illustration.

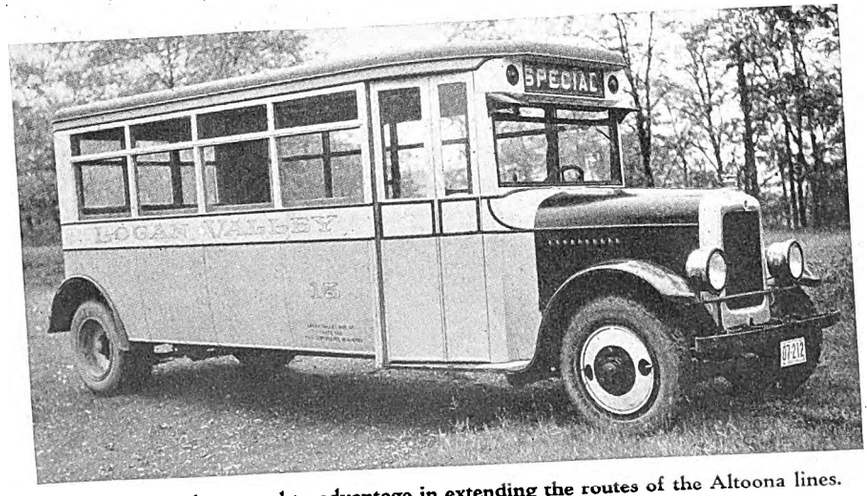
All of the cars already on the property have been equipped with safety appliances and adapted for one-man operation.

Power distribution has been improved by the installation of substations at various locations on the system. All of the feeders have been rearranged and redistributed, eliminating a large amount of copper, and all of the track bonding has been gone over and brought up to 100 per cent condition. These changes have speeded up the car service.

By agreement with the city of Altoona and the Pennsylvania Railroad the company has constructed a new bridge over the main line of the Pennsylvania. All the track and paving on the bridge approaches has been renewed. All the other bridges, which are owned outright, were sand blasted and given two coats of red lead.

The bus service has also been improved. The company purchased seven 21-passenger Yellow type X buses and two White buses. These have been installed on the 40 miles of bus routes to give better service and to improve the operating conditions. A new bus garage has been built and fully equipped.

IMPROVEMENTS CHARGED TO CAPITAL ACCOUNT	
New track, paving and under-drains	$533,436
Thirteen double-truck safety cars	212,065
Three Birney safety cars (transferred)	13,464
Safety equipment for cars	45,376
Substations, feeders, etc.	74,867
New bridges	42,795
Construction equipment—conveyances, welders, signals, etc.	32,095
Seven Yellow 21-passenger buses	43,906
Two White buses (transferred)	11,000
New bus garage and equipment	38,943
Total	$1,047,947
MAINTENANCE EXPENDITURES FOR THE THREE YEARS	
Track and roadway	$343,870
Equipment	244,915
Buses	67,482
Total	$656,267



Buses have been used to advantage in extending the routes of the Altoona lines. Some 40 miles of bus routes are in service

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High-Speed Road for Germany

Engineers discuss engineering and financial features of proposed high-speed electric railway in Germany's industrial district. With few stops on grades and easy curves, a schedule speed of 71 m.p.h. is expected

By Walter Breslauer, Ph.D.
New York, N. Y.

DURING the past two years considerable space has been given in the German technical press to discussions of plans for a proposed high speed railway in the Ruhr industrial area in Western Germany. The latest extended contribution to the subject is a very comprehensive study of the engineering and financial possibilities of such a line by Dr. G. Kemmann of Berlin. In this report, besides making definite recommendations, the author reviews and answers adverse opinions to the plan, which came chiefly from another outstanding specialist in the field of city transportation, Prof. Giese, also of Berlin. Dr. Kemmann's report was made at the request of a company organized by the cities interested to study the entire subject of transportation in the district.

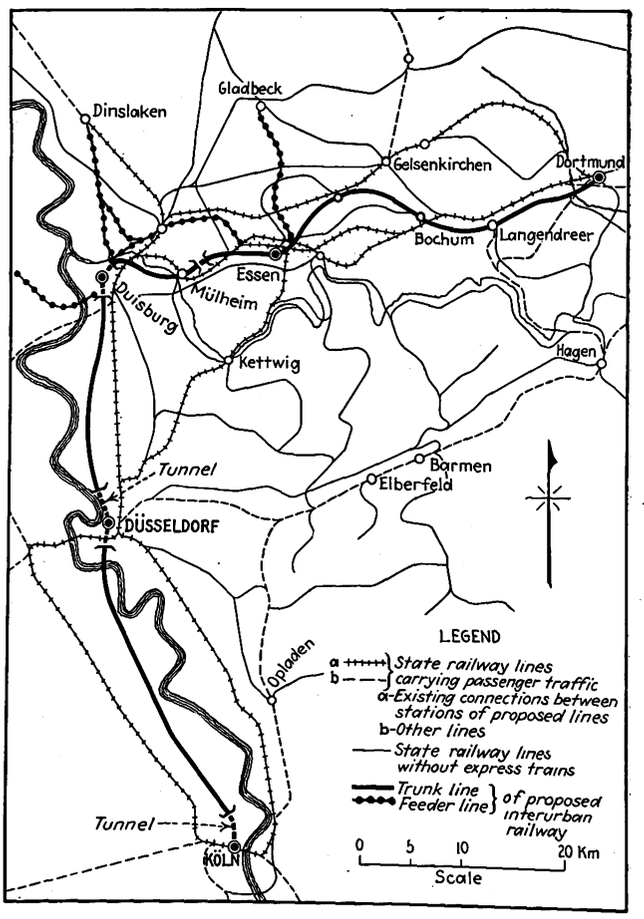
The first engraving shows a map of the area and the route of the high-speed railway, as proposed by the company mentioned. The district shown is one of the most thickly populated in Europe and contains the majority of the coal mines and steel mills of Germany, together with a large number of factories of all kinds. On the line of the proposed route there are ten cities with more than 100,000 inhabitants each, and six cities with from 25,000 to 100,000 population. In addition, there are ten other cities of from 25,000 to 100,000 inhabitants with contributory population. Altogether these 26 cities have about 4,000,000 inhabitants.

Physical Characteristics of Proposed Line

The main features of the line, as proposed by the company organized by the cities to study the project and by Dr. Kemmann, are as follows:

There will be only nine stations, one each in Cologne (Köln) and Dortmund, the terminal cities, and the others at intermediate points. These stations are to be as near the traffic center of each city as possible. Through each city the road is to be built in subways or open cuts or on an elevated structure. Outside of the cities the road is on its own private right-of-way. There are to be no highway or railroad grade crossings and the grades and curves are to be so designed as to interfere with high speed as little as possible. Besides the main line there are to be several branch lines with shorter distances between stops and lighter construction.

The maximum speed on part of the line, that between Cologne and Duisburg, is to be 81 m.p.h. On the section between Duisburg and Dortmund, the maximum speed is to be 62 m.p.h., partly because there are several grades of as much as 1.66 per cent and partly because the right-of-way passes over many mines, with danger of ground subsidences. On the branch lines the maximum speed is 50 m.p.h.



The proposed line traverses Germany's most developed industrial area

Trains are to be made up of combinations of two motor cars permanently coupled, each car being equipped with four motors. Electric power will be supplied at 1,500 volts d.c. and the motors are to develop 170 hp. (hourly rating). Multiple unit control will be used, with possibility of field reduction of 67 and 50 per cent for greater speed. Characteristic curves of the proposed motors are shown in the left-hand illustration on page 503.

Research has been undertaken by the Aero-Dynamic Institute of Göttingen University to obtain a shape of car body that presents the least resistance to the air, particularly in subways. A feature of the design, as shown in the accompanying engraving, is a cover for the trucks on the front end of each car.

According to European custom, two classes of passenger accommodations will be provided, corresponding to the second and third classes on the state railways on

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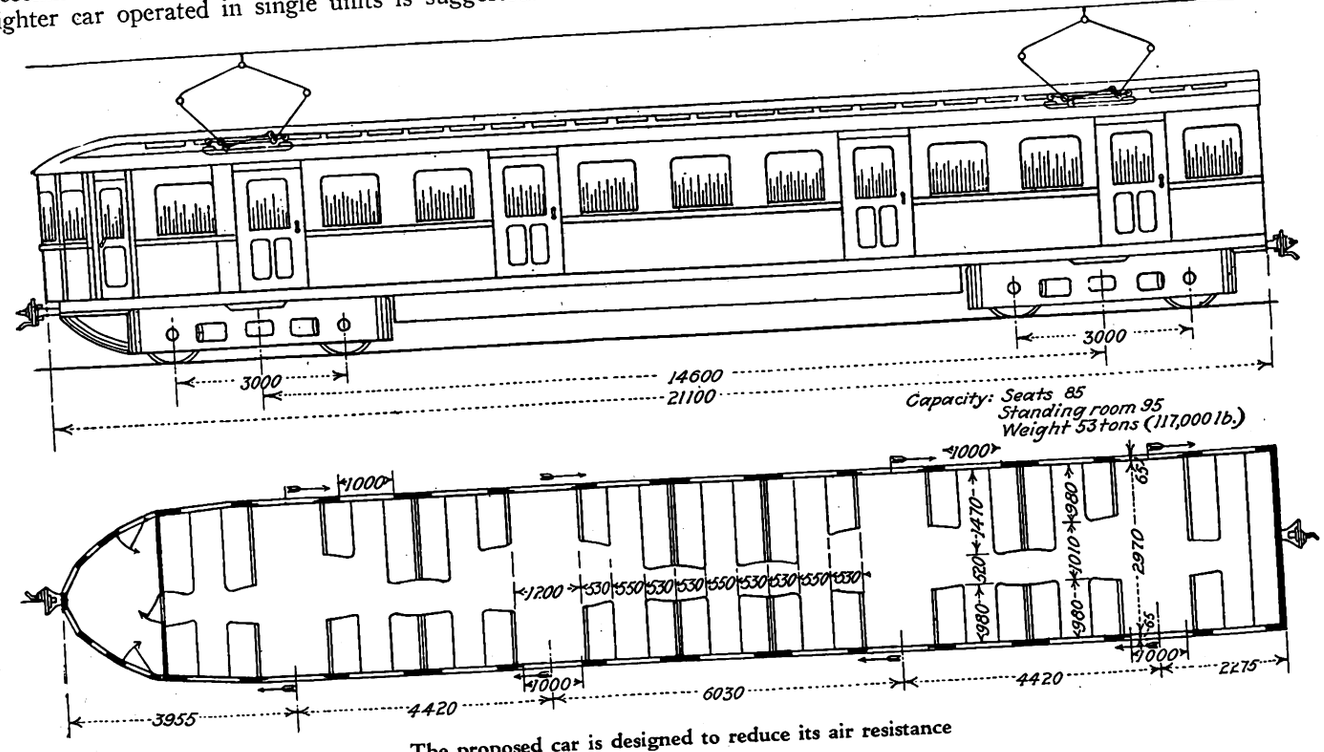
ESTIMATE OF INVESTMENT REQUIRED AND BUSINESS TO BE DONE BY PROPOSED COLOGNE-DORTMUND HIGH-SPEED RAILWAY DURING THIRD YEAR OF OPERATION

	Kemmann	Giese
Total number of fares per year	36,000,000	20,000,000
Average length of passenger trip	15.3 miles	15 miles
Number of passenger-miles	551,000,000	300,000,000
Utilization of seating capacity	33⅓ per cent	25 per cent
Number of car-miles	9,250,000	8,000,000
Capital to be invested	$85,000,000	$100,000,000
Average receipts per passenger-mile	1.8 cents	1.94 cents
Operating ratio	47.6 per cent	72.6 per cent
Profit	$1,675,000	.....
Loss	.....	$2,750,000

which, incidentally, about 60 per cent of the commuter traffic rides fourth class. As the average estimated time per passenger trip is not more than twenty minutes, a ratio of 85 seats to room for 95 standing passengers was assumed. Platforms at the stations will be arranged to accommodate trains of six cars. On the branch line, a lighter car operated in single units is suggested.

miles (177 km.) in 140 to 150 minutes, all stops included. On the proposed line the running time will be only 77 minutes between the two cities, the distance being reduced about 2½ miles (4 km.). The schedule speed during this trip, including the periods for acceleration and braking, but not including stops of one minute in each station, will average 71 miles (113.5 km.) per hour between Cologne and Duisburg and 51 miles (83.3 km.) per hour between Duisburg and Dortmund. To obtain these remarkably short running times, the train has to be kept at maximum speed, with motors running with reduced field, for as long as possible, and the coasting time has to be cut down to the utmost limits.

In the speed figures just quoted, Dr. Kemmann and his associate engineers have allowed only a small reserve in speed in the coasting period mentioned, because they believe this is warranted by the peculiarly favorable operating conditions such as uninterrupted right-of-way,



The proposed car is designed to reduce its air resistance

Power will be distributed at 25,000 volts to five substations equipped with mercury-arc rectifiers.

The automatic signal system is designed for a minimum headway of five minutes. It is expected that on the main line the headway will be 30 minutes, but between Duisburg and Dortmund a fifteen minute headway will obtain at certain times of the day. It is believed that if necessary a five minute headway can be maintained without delay even at the expected speed.

Speed-Time Curves

The upper-right chart on page 503 shows a group of speed-time curves of runs, based on the proposed maximum speed of 81 miles (130 km.) per hour. It is obvious from these that such speeds would not be economical in frequent stop service as the trains would have to cover at least 3.75 miles (6 km.) before the maximum speed is reached and, to provide adequate coasting the stops must be at least 15.6 miles apart.

The express trains on the existing steam railroads cover the distance between Cologne and Dortmund, 73

etc. This action is criticised by some other experts who argue that the few seconds which might be gained if the motors are run at full capacity until braking is begun is not sufficient to allow opportunity to make up for lost time.

The rate of acceleration selected is 1.1 m.p.h. per second (0.5 meters per sec.²). This corresponds to the input of 1,400 kw. for each two-car unit when starting. When running on level tangent track at constant speed with a 50 per cent field, each two-car unit will have a continuous input of about 750 kw.

The third chart on page 503 gives the consumption of energy by trains at different maximum speeds and distances between stops. The point A on this chart represents the conditions on the main line between Duisburg and Dortmund, B those on the branch line and C those on the Berlin subway. On the basis of this chart Dr. Kemmann claims that the watthours per ton-mile, even on the short distance section between Duisburg and Dortmund, will be less than on the branch line and that, in turn, less than on the Berlin subways.

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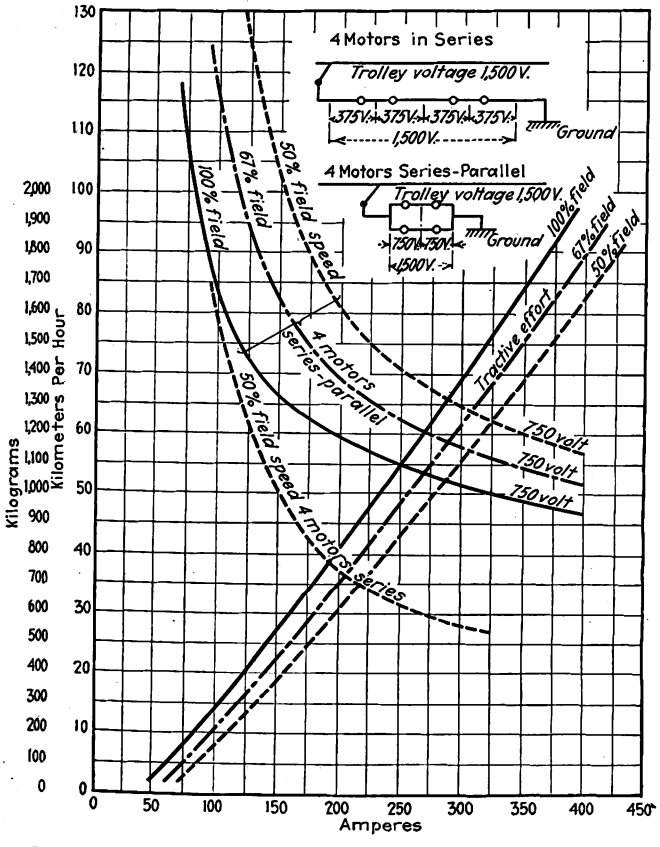
The main line of the proposed railway runs approximately parallel to the main line of the state railroad system, with which it would be in direct competition. Nevertheless, its advocates believe, it has a distinct economic field.

In the first place, the capacity of the existing transportation facilities is now overloaded, complicated as they are because of the necessity of giving service to many scattered factories and mines. Besides this freight traffic, the existing steam railroad lines would still have to care for the through passenger express trains, a large number of which pass through this district. It would still also have to care for the local traffic, which is not being carried by the present interurban electric railways or buses.

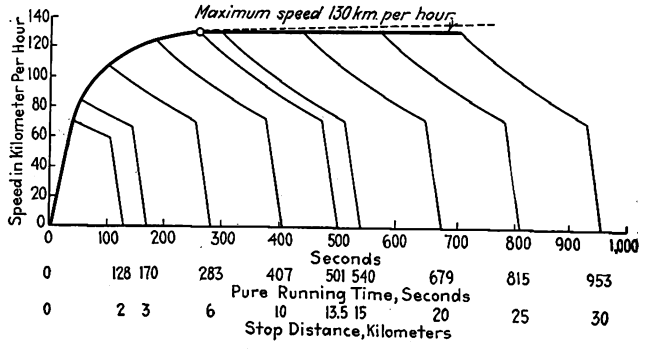


Characteristic curves of motor selected. The motors will be designed to develop 170 hp.

The new line would be primarily for the high-speed interurban business between the nine cities mentioned. Dr. Kemmann estimates that in the third year of operation (1933), 60 per cent of the passengers carried will represent those who otherwise would have used the parallel steam railroad, electric railways or buses, and 40 per cent will be newly created business, resulting from a closer connection of the city centers. It is also believed that the hourly distribution of the traffic will be equalized better than on the existing railways, which chiefly serve commuters. Both terminals of the main line are in very large cities, so it is expected that the through traffic on the line will be a large and constant percentage of the business done.

There is considerable difference of opinion between Dr. Kemmann and Prof. Giese as to the financial results to be expected during the third year. The figures of each are given in the accompanying table.

Certain critics of the proposed line have claimed that the needed increased transportation facilities in this district might better be obtained by an expansion of the existing facilities. Dr. Kemmann's report, however, outlines the difficulty of such a development, especially the costly widening of right-of-way required in the cities, the complications at junctions with numerous branch lines and the difficulties of increasing the speeds of the steam operated trains, especially in the hilly districts around Essen. While the adoption of electric power for the local express tracks would improve conditions, the routes in use are not so well adapted to high speeds as on an independent system of the type considered. Moreover, the cost of the necessary trackage rearrangement would be equal to that of wholly new construction.



Speed-time-distance diagram for different lengths of run

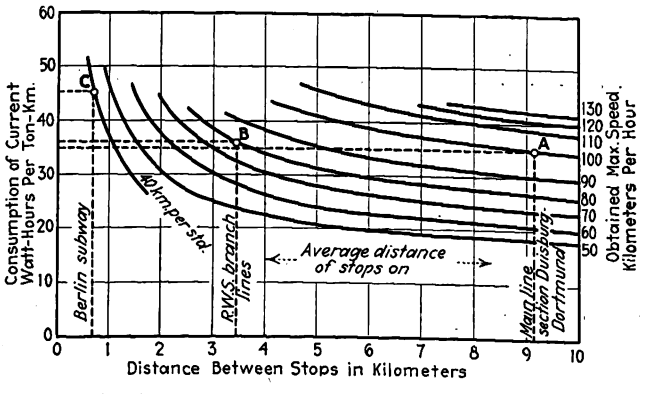


Chart showing energy consumption in relation to distances between stops and maximum speed

As against these claims, it can be argued that the present economic conditions in Germany may make preferable a plan which permits the distribution of the expense over a longer period. The latest reports from Germany are that the directors of the state railway system have approved the expenditure of 300,000,000 marks during a period not yet fixed for improvements of the existing systems in the Ruhr. This decision was reached on the theory that even if the new road is built, the existing system must still handle the through business, the local commuters, and all freight traffic, for which new facilities are badly needed.

The latest contribution to the subject is a pamphlet recently issued by Dr. Kemmann. It contains the principal criticisms of the report which have been published in the German technical press, together with Dr. Kemmann's replies. The criticisms relate particularly to the feasibility of the short running times allowed in the report, to the volume of traffic to be expected and to the economic outcome of the entire high-speed plant as proposed.

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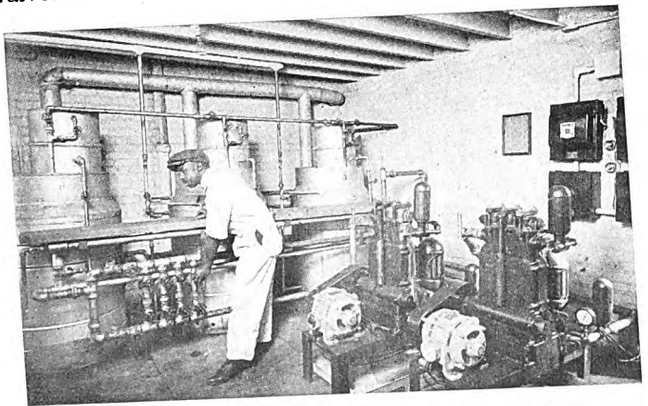
Seven bays are devoted to washing motor coaches

Cleaning a bus in Los Angeles by means of the new high-pressure system

Bus Wash Rack

WASHING of buses is facilitated by a new wash rack just completed in the garage for the motor coach division of the Los Angeles Railway, Los Angeles, Cal. It is built of steel and brick, 37 ft. 1 in. wide by 123 ft. 6 in. long. There are seven bays for washing motor coaches and automobiles, one-half bay for cleaning parts, an equipment room and a locker room above this for the car washers. The locker room contains a full-length steel locker for each car washer. It also has benches for the workmen and a lavatory with hot and cold water.

The equipment room, which is on the ground floor, contains two high-pressure U. S. compressor pumps, hot water heaters, and solution tanks. The hot water heaters are controlled thermostatically. Five lines run into the intake manifold of each pump. They are (1) cold water, (2) hot water, (3) soap, (4) Oakite and (5) distillate. The valves and piping are arranged so that any one of these liquids or any combination of them may be turned into the intake manifold of either pump. The head car washer decides the liquid or mixture of liquids that is to go through each pump and turns the right combination into the pump manifold by adjusting the valves.



The equipment room contains high-pressure pumps, hot water heaters and solution tanks

Each pump is capable of delivering continuously 4 gal. per minute at a pressure of 300 lb. to any four outlet nozzles of the high-pressure pumping system. Each pump is connected to a $1\frac{1}{2}$-in. high-pressure pipe line that runs the entire length of the wash rack. A $\frac{3}{4}$-in. line is tapped off each of the pump lines at intervals and runs to the four corners of each washing bay. The $\frac{3}{4}$-in. lines from each of the two pumps are joined to a common high-pressure hose outlet. Each line is arranged with a globe valve and a check valve. The globe valve regulates the flow of liquid and the check valve is intended to prevent the entrance of liquid from the other pump line.

With this arrangement a washer may use the liquid of either high-pressure line or any combination of liquids contained in the two lines. There is a remote-control system with a push button located at each high-pressure hose outlet, so that from his station a washer may cut off the pump. However, these buttons are arranged in parallel so that all stations must have their circuits open before the pump stops operating.

Each bay is arranged with high-pressure air hose for blowing off the water after the bus has been washed. The room for cleaning parts has two high-pressure hose outlets and high-pressure air outlets similar to those in the washing bay. City water outlets are in all washing bays and in the room for cleaning parts. One of the washing bays is arranged with a pit, so that the chassis and underneath parts of motor coaches and automobiles may be washed more readily.

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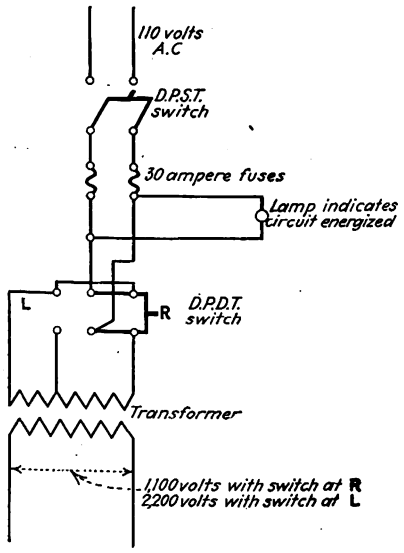
Maintenance Methods and Devices

Simple, High-Potential Testing Outfit

By R. S. Beers
Railway Engineering Department General Electric Company, Schenectady, N. Y.

MOST of us visualize a high-potential testing outfit as an elaborate and expensive piece of apparatus. Actually, any repair shop can have one at a low cost by purchasing a standard 1½-kw. lighting transformer that has a primary winding for 2,200 volts and a secondary winding with taps for both 110 and 220 volts. By connecting this secondary to the usual 110-volt a.c. lighting circuit, a potential of either 1,100 or 2,200 volts may be obtained. The former is recommended for testing overhauled or repaired motors, armatures, fields, etc., while the 2,200 volts should be used for rewound armatures and any other essentially new parts.



Connections for high potential test

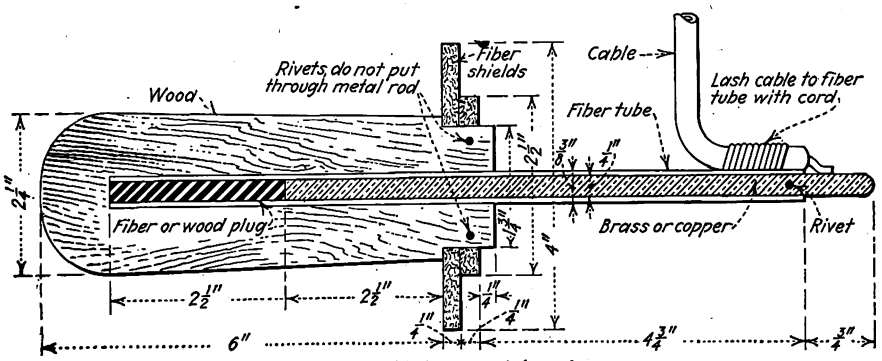
The other parts for the complete outfit are two 110-volt knife switches, fuses and high-tension leads which can most easily be made of automobile ignition cable. The high-tension leads should be in uncut lengths without breaks in the rubber covering.

There are two divergent methods of testing a piece of apparatus with the high potential. One is to terminate the high-tension cable in a bare wire or hook and always be sure the leads are dead when they are attached to the apparatus. For safety it is customary to surround the device being tested with a simple barrier such as a cord or white tape. The other method is to attach insulated handles to the ends of the high-tension leads and touch these while alive to the apparatus. A barrier around the apparatus under test is not ordinarily used, as the tester is near by and gives sufficient indication of danger.

An insulated handle that is easy to make and that has been used with success is shown in the accompanying illustration. The insulating properties of the wood from which these handles are made can be greatly increased by drying the wood out in the armature oven and then soaking in linseed oil for a day or so. This will fill the pores of the wood with oil and prevent moisture from entering.

The sketch shows the metal core about 2½ in. shorter than the fiber tube, the idea being to give ample creepage distance from the live metal along the surface of the fiber tube.

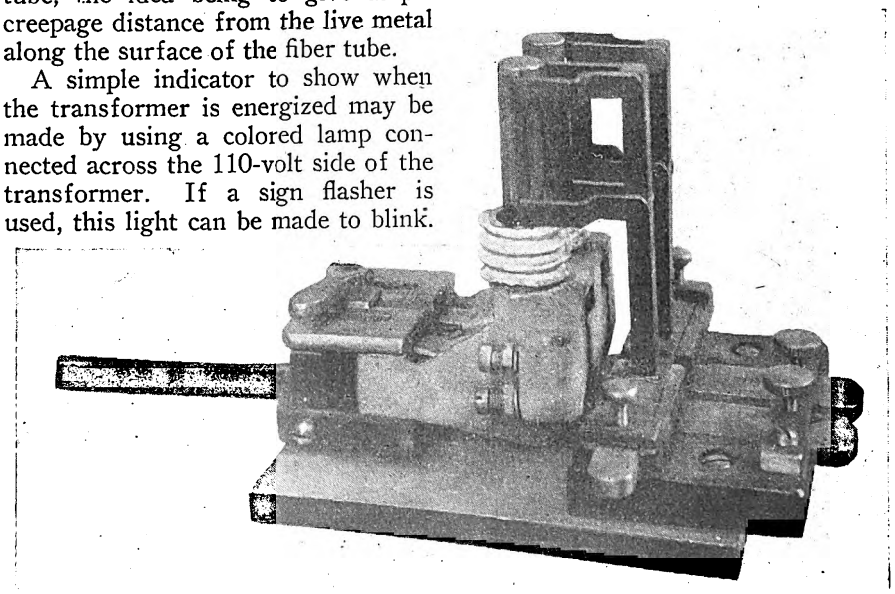
A simple indicator to show when the transformer is energized may be made by using a colored lamp connected across the 110-volt side of the transformer. If a sign flasher is used, this light can be made to blink.



Handle for high potential testing

To Check Alignment of Brush-Holder Parts

MANY of the troubles with railway motors can be traced to improper location of the brush-holder in the motor frame. To make certain that all parts of the brush-holder itself are in proper alignment before installation the Third Avenue Railway, New York City, uses in its 65th Street shop, the special fixture illustrated. It is shown with a Westinghouse type 310 brush-holder in position. The brush-holder itself is held firmly at the carbon box end by a clamp which has a metal block that fits inside the carbon box. This insures that the brush-holder frame is lined up carefully with respect to the finished inside of the carbon box. The upright studs are checked for alignment by a gage on the opposite end of the fixture. The two upright



Fixture for checking brush-holders for alignment of various parts

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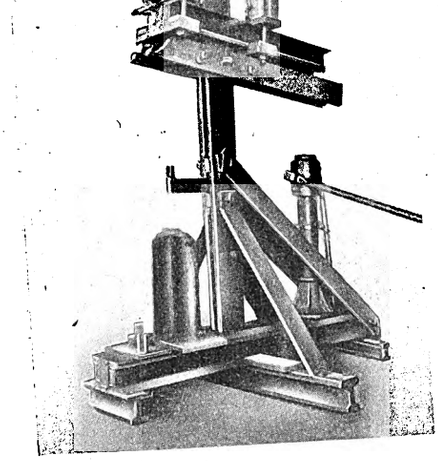
arms are arranged so that they will slide sidewise or back and forth and when in correct position they are clamped by setscrews. With this arrangement the upright studs can be checked quickly and accurate alignment with respect to the finished inside of the carbon box is assured.

Hydraulic Press

IN THE shop of the Binghamton Railway, Binghamton, N. Y., work accumulated due to the absence of a suitable press. This became quite serious at times and finally it was found necessary to design and construct a hydraulic press. The press



Simple hydraulic press

constructed is shown in the accompanying cut.

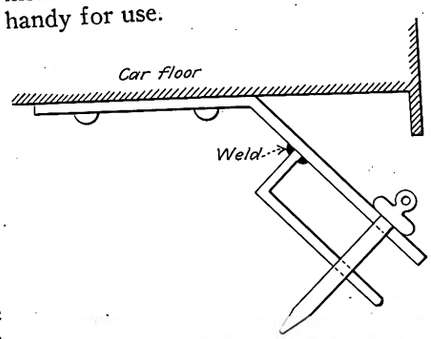
The foundation consists of three pieces of 80-lb. tee rails resting upon the floor. The base of the press is made of two pieces of the same rail with the space between filled with metal. They are tied together with ¾-in. bolts and welded. The post is made of two pieces of 1 in. x 6 in. steel spaced 1 in. apart by fillers, bolted to each other and to the base rails. This post is drilled with seven 1½-in. holes at the top to permit raising or lowering the rams to take care of various kinds of work.

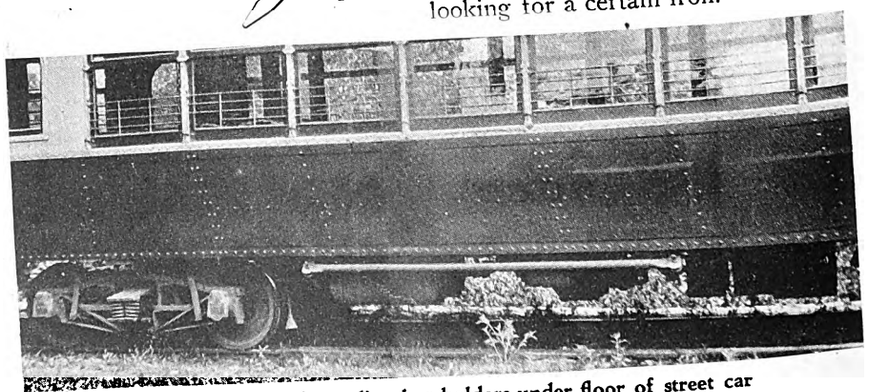
There are two press rams, one for light work and the other for heavy work. The light ram is made from 1-in. x 4-in. material whereas the heavy ram is made from 80-lb. tee rail. These rails are bolted together and filled in the same as are the base rails. Two heavy clamps give additional strength. When the heavy ram is to be used the light ram is removed, but the light ram can be used with the heavy ram in position. Additional rigidity of the post and ram is obtained by 1-in. x 4-in. braces fastened to the foundation and base rails. The leverage of the rams is two to one and the hydraulic power is obtained by a 15-ton hydraulic hand jack mounted on the base directly under the ram extension. The bed which is shown in the illustration resting upon the base under the ram is made of a piece of 3½-in. pipe welded to a 9½-in. x 16-in. x 1-in. plate. Four ribs ¾ in. thick are welded to this pipe and to the base. This press has afforded a means for increasing production.

Coupling Bar Holders

CONSIDERABLE trouble has been experienced by the Cincinnati Street Railway, Cincinnati, Ohio, in pushing disabled cars around sharp curves with the ordinary coupling bar. In an effort to solve this difficulty satisfactorily a bar has been developed with which a car may be moved around any curve on the property with ease.

This bar is 8 ft. 3 in. long and is made out of 2½-in. heavy pipe. A feature of the arrangement is the method employed for suspending the bar when not in use under the side of the car. The jaws of the hanger open downward and the bar, once inserted, is held securely in place with coupling pins. The bar is so long that it must be carried in the brackets and the position of the hanger jaws insures having two coupling pins handy for use.

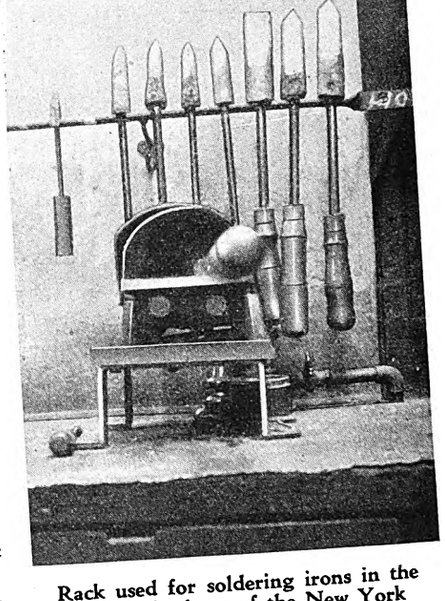




Arrangement of coupling bar holders under floor of street car

Rack for Soldering Irons

SYSTEMATIC arrangement and accessibility of tools in a shop usually reflects the quality of work being performed. Foreman armature winder Max Siebner of the New York



Rack used for soldering irons in the Woodside shops of the New York & Queens County Railway

& Queens County Railway, Jackson Heights, N. Y., believes that this is very important and has arranged all tools in his section of the Woodside shops in this manner. The accompanying cut shows one of the heating furnaces with its soldering iron rack. These irons are in clear view and a minimum of time is required to select the proper one for the job on hand. All irons must be in place on the rack when not in use. A careful check is made every night to see that all have been returned and are in place. The rack consists of a piece of ½-in. flat steel bar drilled on either end for mounting and notched to permit of suspending the various irons. It has improved the appearance of the shop and eliminated loss of time in looking for a certain iron.

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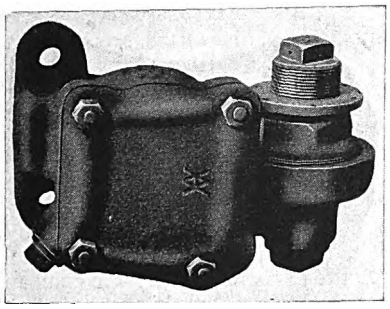
New Equipment Available

Feed Valve Adjustment Made Easier

IMPROVEMENTS have been incorporated in a feed valve, called the C-8, developed by the Westinghouse Traction Brake Company, Wilmerding, Pa., and now available for use with air-brake equipments.



Decreased maintenance is made possible by the use of this new feed valve

The new design facilitates maintenance of correct adjustment at low cost.

A larger ring-fitted supply piston, with definite size by-pass choke, replaces the loose fitting piston of former designs, assuring more positive and reliable performance. The piston-stem guide is larger, which reduces wear and insures correct alignment of the piston, while the helical shaped periphery of the guide tends to keep the bush scraped free of dirt.

All wearing parts can be removed readily without special tools. Slip bushings are used throughout, while the slide valve bushing and piston bushing are in one piece.

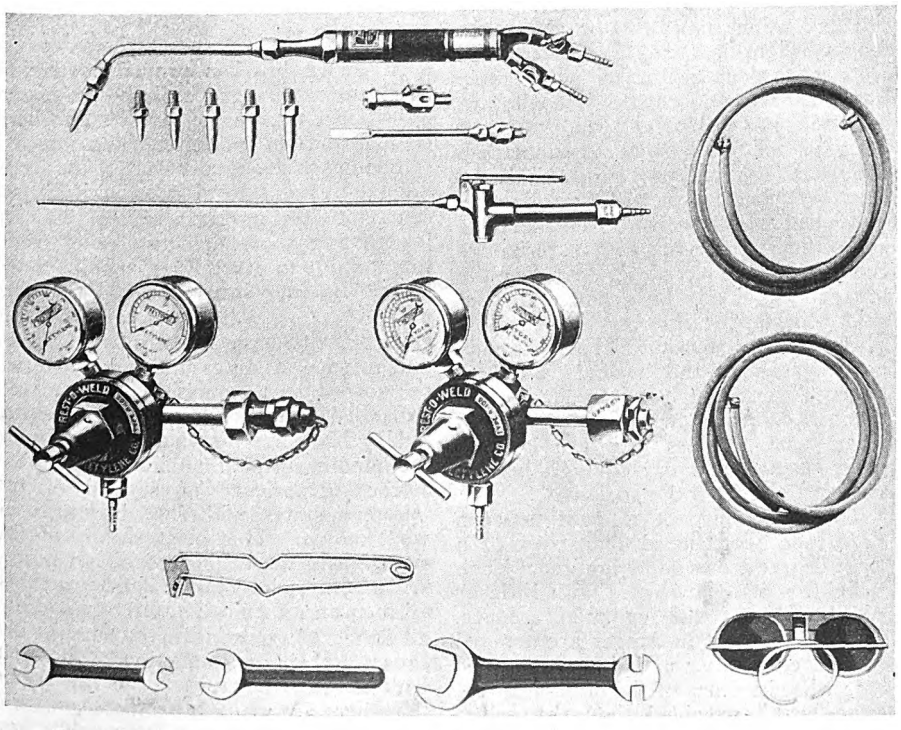
Three New Welding Outfits

MEETING the demand for low-price assemblies, three new welding outfits have been placed on the market by the Oxweld Acetylene Company, New York, N. Y. These outfits are made possible by the addition to the Prest-O-Weld line of two small two-gage regulators, and two special blowpipe tips, one for heating and brazing, and the other for soldering.

The type W-101-A outfit is for use where only an occasional welding job needs a large size blowpipe for straightening operations. For this purpose a No. 10 tip is included which is also suitable for reasonably heavy welding operations. A No. 6 tip is also provided for the usual type of welding job. A special heating tip and soldering tip which consume acetylene only, are designed for light brazing and for soldering.

The type W-102-A general purpose outfit, is for shops that wish to employ the oxy-acetylene process in all of its many applications, welding, decarbonizing, heating, soldering, brazing, lead burning and other repairs. Five welding tips and a decarbonizing blowpipe as well as the heating and soldering tips are included in this outfit.

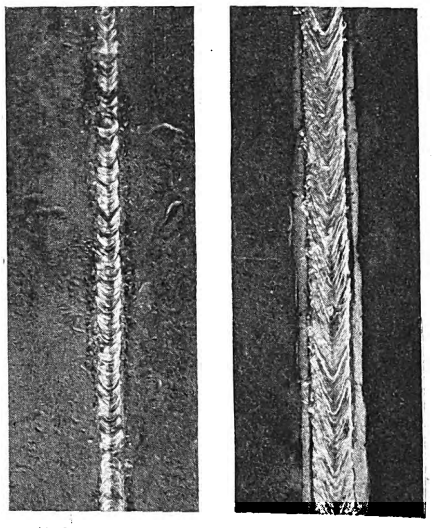
The type W-102-B welding outfit is recommended for welding light and medium castings. It is also suitable for sheet metal work and for light production welding such as is used in tanks, steel window frames and similar work. This outfit includes five welding tips.



One of three new welding outfits, the Type W-102-A for general purpose work

New Arc Welding Process Developed

DEVELOPMENT of a new arc-welding process termed by the manufacturers the "Electronic Tornado" is announced by the Lincoln Electric Company, Cleveland, Ohio. In it a specially induced magnetic field alters the ordinary characteristics and effects of the welding arc.



At left is shown a metallic arc weld; at right is one made by the "Electronic Tornado"

The company predicts its adoption for automatic welding in the fabrication of cars, tanks, pipe lines, box girders, etc., but it is not expected to find immediate use in hand-welding operations. The metal deposited in the weld by the ordinary electric arc process has characteristics like those of cast steel, while that deposited by the new process is said to have equal or better physical characteristics than the metal of the plates joined by welding, due to the purifying effects. The smooth finish obtained with the process is said to be due in part to the high speed of travel of the welding heads and in part to its inherent characteristics.

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Association Activities

The Santa Claus Idea of Government*

By Henry Swift Ives
Vice-President Casualty Information Clearing House, Chicago

GOVERNMENT ownership is an attempt to transform the state into a benevolent Santa Claus doing everything for everybody at no cost to anybody. Presumably, the old feudal doctrine that the government should support the people has long since been discarded in favor of the theory of democracy that the people should support the government. The continuing agitation for government ownership and control of industry, however, belies that assumption.

There is, of course, a very potent lure in this Santa Claus idea of government, and that is why it has survived through so many centuries. Gift-government always has been popular among certain classes. Getting something for nothing never loses its appeal. Pilfering politicians thrive on such schemes, professional uplifters count on them to provide sustenance not only for their hobbies but for themselves, and socialists advocate them deliberately as a curb to prosperity, for prosperity spells the doom of socialism. Those who are subsidized seldom complain of the subsidy or investigate its source.

THERE is nothing particularly new in the idea of transmuting profits into gratuities through the alchemy of socialism, but the headway it has made in a country dedicated to liberty and resting on the sound foundation of private enterprise is rather surprising.

Has No Place in Democracy

It seems illogical, however, and almost tragic, that in a country which has prospered and grown great because of its espousal of democracy in its most virile form, the greatest threat against continuing prosperity is the rejuvenation of the long outlawed theory of government of which Santa Claus is the patron saint. The political Christmas tree, indeed, is now being trimmed and festooned with such gewgaws and baubles as railroads, insurance companies, electric light and power plants, coal mines, gas plants, street railways, grain elevators, oil wells and the like awaiting the glad day when the red-clad Kris Kringle will appear and pass them about among the faithful. He promises a golden age of luxury, idleness and wastefulness in which government deficits will be substituted for private profits and in which politics instead of business and work will become the national dividend producer.

There is nothing particularly new in the idea of transmuting profits into gratuities through the alchemy of socialism, but the headway it has made in a country dedicated to liberty and resting on the sound foundation of private enterprise is rather surprising. Government ownership and the imperious regulation and control of industrial processes by the politically minded take away the very fundamental rights of man which the American commonwealth was designed to foster and protect, and their inevitable consequence is despotism. It is about time that property owners and business men take stock of this situation and appraise the growing tendency towards confiscatory legislation more fully.

Ardent Capitalists Become Socialists

There would appear to be altogether too many business men in this country who are ardent capitalists when their own business is concerned, but who are apt to be just as ardent socialists when the other fellow's business is concerned. This class has had more to do with the headway made by the socialization movement than have all of the socialists and ordinary mine-run of pink agitators combined. One has only to examine the background of any government ownership scheme to discover the support given to it by substantial business men not engaged in the business affected. When government competition, regulation and control, however, touches them these same business men are loud in their protests and cry to high heaven to save them from the socialists.

The community of interest between all of the jeopardized industries to a large degree seems to be ignored. Each is fighting its own battles with little or no thought of the common menace. Often those most in danger are arrayed against each other and do not seem to care what becomes of the others "in the same boat," provided they themselves can keep a few feet ahead of the socialist sheriff with his writ of ejectment. This unfortunate division should be speedily remedied if an ultimate surrender to socialism is to be avoided.

The business man and property owner who secretly feels that he may gain some privilege or make a saving if somebody else is repressed by the strong arm of the state is an economic illiterate.

Insurance Companies and Utilities Have Common Interest

A large number of the leading stock casualty insurance companies of this country are face to face with this government ownership problem. In sixteen states workmen's compensation insurance is now being written in so-called state funds in competition with or to the exclusion of private companies. Despite the fact that this type of government ownership has proved a striking economic and social failure—evidenced by the fact that in the nine states where competition is permitted the private companies write 85 per cent of the business and the state funds only 15 per cent, notwithstanding a substantial saving in rates—attempts are being made to extend it to other lines, such as automobile liability insurance and the like.

IT ought to be an axiomatic political principle that no single industry or business can be lifted out of the mass of privately conducted enterprise, endowed with the attributes of sovereignty, subsidized by taxation and operated by a political bureaucracy without every other privately conducted business feeling the baneful and depressing effects of such a procedure.

Two states, Wisconsin and Massachusetts, also have life insurance funds, and in several states and municipalities the government ownership idea has been expanded to include funds for insuring public buildings against fire and, for the bonding of public officials. The disastrous experience of several of the Western states with hail insurance is well known. This brief survey of the situation in the business which I represent ought to lead to the conclusion that all insurance men are bitterly opposed to all kinds of government ownership because of their own afflictions. But that isn't necessarily true. I do not doubt that there are many insurance men who, at some time or other, have advocated state or municipal ownership for elec-

**Abstract of address delivered at the joint convention of the Illinois Gas Association, the Illinois State Electric Association and the Illinois Electric Railway Association, at Springfield, Ill., March 14, 1928.*

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tric light and power plants, street railways and gas companies. I do doubt, however, if there is an active insurance man who ever has advocated government ownership of insurance.

In the same way I do not doubt that there are public utility executives and owners who, at some time or other, may have advocated and supported state insurance. I doubt, however, if there is a public utility executive or owner who ever has advocated government ownership of his particular business.

To both of these groups I wish to say that they ought to be just as much opposed to government ownership of any other industrial enterprise as they are opposed to government ownership of the enterprise in which they are engaged. It ought to be an axiomatic political principle that no single industry or business can be lifted out of the mass of privately conducted enterprise, endowed with the attributes of sovereignty, subsidized by taxation and operated by a political bureaucracy without every other privately conducted business feeling the baneful and depressing effects of such a procedure.

As long as this condition of chaotic political and economic thinking continues among the avowed supporters of democratic institutions—and these constitute more than 90 per cent of our population—the socialization movement, with its gift-government decoy for the unsophisticated always in the foreground, will continue to make progress.

There are many pitfalls which must be avoided if legitimate private enterprise is to be preserved in this country, and if individual initiative is to remain unfettered. The chief of these are the gradually growing American tendency to look upon capital with suspicion, to denounce large profits as immoral if earned by others than the denouncer, to yield to the delusion that wealth which is confiscated will continue to be created, to believe that the public can add to its possessions by taking property from individuals, to hold that compulsory equality of condition is more to be desired than unrestricted equality of opportunity, and to think that the leveling process can be accomplished by subsidizing mediocrity at the expense of genius. All of these are fundamental economic distortions.

Progress Dependent on Private Enterprise

After all, no material benefit has ever reached mankind except through the agency of private enterprise. To deny its potency is a confession that democracy is a failure. To shackle it with the chains of state slavery is equivalent to affirming that men can conduct governments better than they can conduct their own business affairs, a statement which history has denied from the dawn of recorded time until the dawn of today. In my opinion, the leading industrial enterprises of this generation—"big business," if you please so to designate them—are being conducted with a higher degree of fairness and justice to those engaged in them, with a more sympathetic regard for human aspirations and ambitions, with a keener sense of their responsibility to the people and to the nation, and with a more searching appreciation of the more lofty ideals of service, than any similar or comparable government enterprises on the face of the earth. I say that industry can run itself and is today running itself better than any government is being run. There is no "if" about it. The only effect of radical state interference is to supplant order with confusion. Industry today is for the most part two jumps ahead of the requirements of the people; most governmental organizations are two jumps behind.

THE business man and property owner who secretly feels that he may gain some privilege or make a saving if somebody else is repressed by the strong arm of the state is an economic illiterate.

Railway Engineering Association Holds Meeting in Chicago

ATTENDANCE at the convention of the American Railway Engineering Association, held on March 6-8 in Chicago, was larger than at any previous meeting. The registration, through March 8 was 968 members and 348 guests, or a combined total of 1,316. Last year the total was 1,251, and in 1926 it was 1,030. An exhibit was held, as usual, in the Coliseum building. There was a concurrent exhibit of signal apparatus, and the American Railway Association, signal section, held a two-day meeting on March 5-6.

At the railway signaling meeting, the recommended code on colors and forms for traffic signals for highway vehicles, as approved by the American Engineering Standards Committee on Nov. 15, 1927, was submitted by the committee on highway crossing protection. Later, highway crossing signals were again considered in the report of the committee on grade crossings of the A.R.E.A., when a standard highway crossing sign, carrying the words "Railroad Crossing" was recommended by the committee.

Brief abstracts of some other reports presented at the convention of the A.R.E.A., selected as of especial interest to electric railway operators, follow:

Ties

Among the subjects investigated during the year were anti-splitting devices for wooden ties, of which a number were tested at the Altoona laboratory of the Pennsylvania Railroad. The tests were made on 14-in. tie sections in which a $\frac{1}{4}$-in. slot was cut from one end of the block to within 3 in. of the other end. The anti-splitting irons were then pressed into the ends of the block so that they extended across the slot, and a wedge was driven into the slot. The conclusions, in brief, were: (1) An anti-splitting device should be straight where it crosses the split or check, rather than curved; (2) it should cross the split at right angles; (3) "S"-irons with a small perpendicular lug at the end have more holding power than the standard "S"-irons; (4) the holding power of a device with a right-angle bend supported by an end lug is slightly in excess of the standard "S"-iron with end lug.

Another subject studied was the holding power and thrust resistance of spikes in various kinds of wooden ties. Five thousand tests on this subject were made in the test department of the Santa Fe Railroad. More damage to the wood fiber was found when no holes were bored, or where the holes were too small. The recommendations were: (1) that holes for cut spikes in hard wood be $\frac{1}{16}$ in. smaller than the diameter of the spike; (2) that holes for cut spikes in soft wood be $\frac{1}{8}$ in. smaller than the diameter of the spike. Tests so far indicated that the chisel edge of the spike should be slightly less than the diameter of the hole.

Electricity

The report of this committee also comprised the report of the electrical section of the American Railway Association. Reference will be made to the longest sections of the report. One of these was a preliminary draft of specifications for catenary construction, though the committee points out that these specifications are subject to further revision, particularly such parts as relate to loading, unit pressures, and clearances. Further consideration of these features, it says, should be deferred until sub-committee No. 5, jointly with the N.E.L.A., concludes the preparation of wire crossing specifications satisfactory to the railroads. Another extended section in the report related to standardization of insulators, on which the sub-committee has been working with the American Engineering Standards Committee and the Bureau of Standards, for the purpose of reducing the number of varieties of one-piece porcelain insulators. Another extended section related to specifications for track and third-rail bonds. Formulas and charts giving the resistances of different types of bonds are given, with recommended methods of installation, testing, etc. For manganese track rails, the committee reports that the manufacturers advise against the use of heat-applied bonds and recommend mechanically applied bonds. On this point, the

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committee studied the possibility of field drilling of bond holes in such rails, and found it could be done with a machine that will give a heavy rigid feed and low speed. Another extended report related to the design of indoor and outdoor substations. Other subjects were treated, but less extensively, than those mentioned.

ECONOMICS OF RAILWAY OPERATION

The most extended division of this report was on the effect of motor truck and bus lines on branch or feeder steam railroad lines. It was shown that as compared with ten or twelve years ago, steam railroads have been losing their short-haul passenger traffic to the buses. The number of passengers carried, passenger-miles run, passenger revenue and revenue per passenger-mile have all decreased on Class I railroads, as compared with 1920 or 1921. The reasons for public preference for travel by motor coach are given as lower fares, frequency of service, and "store-door" principle of passenger service. The committee believes that the railroads should give serious consideration to the use of highway motor coaches and rail motor cars, when their use as a substitute for steam service will result in larger net income or reduction in operating loss. The committee believes that recent decisions of state courts are favorable to the right of the existing rail carrier to furnishing such highway transportation as is needed.

TRACK

The most extended section in this report related to track construction in paved streets, where the committee presented for adoption and recommended practice a series of plans of ironbound manganese center frogs for 7-in. and 9-in. girder rails. The committee has under consideration plans for grooved tongue switch and mate for industrial track and connected tongue switch for main line use, as well as plans for ironbound manganese insert crossing, all for presentation in a report at a later date. A short section in the report referred to methods of reducing rail wear on curves with particular reference to oiling the rail or wheel flanges. The statement was made that quite a number of railroads are oiling rail and flanges both by hand and with devices made for this purpose and that desirable economies can be effected thereby. Wear on the high rail of the curve is greatly reduced, the life of ties is lengthened due to less regaging, less tread wear occurs on the low rail, curve resistance is lessened, and there is reduced wear on flanges. It is essential that the proper oil be used. The viscosity of the oil is important as it must be sticky enough to adhere to the flanges for application to the rail ahead and must function through a considerable temperature range. It is also essential that the oil be continuously applied, either to the wheels of every train using the track or to the rail ahead of every train, as less frequent applications of oil are not satisfactory.

Purchasing Agents Select Kansas City for Next Convention

MAY 28-31 has been selected as the time for the thirteenth international convention and exhibit of the National Association of Purchasing Agents. It will be held in the American Royal Building, Kansas City, Mo.

The convention program this year is being prepared to cover purchasing of commodities. There are also functional groups, such as the public utility group, composed of purchasers for the utilities. In this division purchase policy, association under particular connections with vendors, contacts with engineers in their own departments, standardization of particular problems, and similar topics will be covered.

Weekly Engineering Index Service

WEEKLY publication of an engineering index service is announced by the American Society of Mechanical Engineers. This is an extension of the old *Engineering Index*. By this service valuable material in 1,700 publications received by the United Engineering Societies Library is reviewed by a staff of editors qualified by practical field experience. Each article is then described in a carefully prepared note, and these notes are classified under one of the thirteen subject headings in which the different phases of the engineering interest are listed. They are then printed on index cards, convenient for filing, and sent each week to subscribers.

The classification "Railroads and Railways" is subdivided as follows:

12. Railroads and Railways:
A. Accessories—Signals, train control devices, etc.
B. Construction — Right-of-way, tracks, ties, stations, yards, etc.
C. Locomotives — Design, construction, operating, etc.
D. Railroads — Operation, management, etc., of trunk and main-line railroads.
E. Railways — Operation, management, etc., of street, and interurban railroads, subways, elevated railways, etc.
F. Rolling Stock—Car building, lighting, heating, etc.
G. Shop and Shop Equipment—Repair shops, roundhouses, equipment, etc.
M. Miscellaneous—Other subjects relating to railroads not otherwise classified.

For information concerning this service, together with sample index cards, address Major Carlos de Zafra, director, the Engineering Index Service, 29 West 39th Street, New York, N. Y.

City Planners To Meet in Texas

FORT WORTH and Dallas, Tex., will be hosts to the twentieth meeting of the National Conference on City Planning, which will be held in those cities May 7-10. The session of May 7 will be held at Fort Worth, after which the party will take buses to Dallas, where the meetings will be held.

Among other things a number of papers on street traffic planning and other topics of interest to transportation men are included. Those intending to attend are urged to communicate with Flavel Shurtless, secretary of the National Conference on City Planning, 130 East 22nd Street, New York City.

New York Alumni to Discuss Transportation

"SOME Interesting Steps in Transportation, Past, Present and Future," will be discussed by the New York Alumni Association of Tau Beta Pi, co-operating with the New York sections of the Founder Engineering Societies, at a meeting to be held in the main auditorium of the Engineering Societies Building, 29 West 39th Street, New York City, Thursday, March 29, at 8:15 p.m.

The speakers will be Daniel Willard, president Baltimore & Ohio Railroad; Major-General John F. O'Ryan, president Colonial Air Transport Company, Inc., and Colonial Western Airways, Inc.; Edward Hungerford, director Baltimore & Ohio Centenary, who will present a film, "The Fair of the Iron Horse," depicting the main events of the B. & O. centenary; and Lieutenant-Commander Charles E. Rosendahl, U.S.N., commanding officer of the airship *Los Angeles*, who will describe with motion pictures the landing of the *Los Angeles* on the deck of the U.S.S. *Saratoga*, and also tell about his recent trip to Panama.

Detroit Selected by Central Accountants

MEMBERS of the Central Electric Railway Accountants Association have decided to hold the next meeting in Detroit on July 27 and 28, according to an announcement from Secretary L. E. Earlywine.

World Engineering Congress at Tokio in 1929

PRELIMINARY announcement has been made through the United States Department of State of a World Engineering Congress to be held in Tokio, Japan, for two weeks toward the end of October, 1929. The congress will be held under the auspices of the Kogakkai (Engineering Society of Japan), of which Baron K. Furuichi is president. An American committee has been organized, with Hon. Herbert Hoover, Secretary of Commerce, as honorary chairman, Elmer A. Sperry, active chairman, and Maurice Holland secretary. The committee members are engineers who are nationally prominent.

The congress proposes to discuss various engineering subjects in anticipation eventually to initiate and promote international co-operation in the study of engineering science and problems in all its branches and to cultivate a feeling of brotherhood among engineers of the world.

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Joint Interests of Utilities Emphasized at Springfield Meeting

Major speeches at joint sessions of Illinois Electric, Gas and Electric Railway Associations last week in Springfield, Ill., show that interests common to all utilities are increasing

NEED for a greater measure of co-operation between all utilities in furthering their common interests and promoting better service to their customers, the evils inherent in government ownership of business, the opportunity offered the public service company to assume an active, helpful part in community affairs as a good citizen, and an explanation of the construction and functioning of terminable permits constitute the outstanding features of the joint sessions of the Illinois Electric, Gas, and Electric Railway Associations which assembled in Springfield, Illinois, March 14, for a two-day convention. Approximately 800 delegates listened to messages from such authorities in their respective fields as R. P. Stevens, president of the American Electric Railway Association, Oscar H. Fogg, president of the American Gas Association, Henry Swift Ives, vice-president of the Casualty Information Clearing House, Chicago; Charles N. Wheeler, assistant to the president Illinois Power & Light Corporation, and E. R. Dillavou, assistant professor of business law and economics, University of Illinois. A report of the first day's sessions appeared in this paper, issue of March 17, page 478.

Thursday morning's joint session of the three associations was featured by the address of Professor E. R. Dillavou of the University of Illinois on the subject of the terminable permit. Pointing out that there was nothing novel or complicated about a terminable permit, Professor Dillavou defined one as a franchise which continues indefinitely unless the utility is purchased by the municipality, or unless the permit is cancelled because of misconduct on the part of the company. Continuing, he said, "Such a permit seems to remedy the evils of the short term franchise and at the same time protects the public interest, particularly since public utility operation is subject to regulation by a state commission. The investor, having faith in the behavior of the management, and realizing that his money will be repaid it the city sees fit to terminate the permit, is ready to supply funds from time to time as the progress of the business demands."

Commenting on the unwillingness of municipalities to surrender control over the local utilities and where possible continue to impose onerous conditions on them in favor of the municipality, Professor Dillavou outlined the four possible solutions of this problem which have been suggested by the laws of terminable permit states. He detailed that "the laws of Louisiana, which limit the use of such permits to the city of New Orleans, allow the municipality to insert any conditions which may be agreed upon at the time the permit is issued. Oklahoma provides that all new franchises must be for a definite term, but they may be surrendered at the option of the utility for terminable permits which embody the terms of the surrendered franchise. Massachusetts has a law which makes it possible for many of the utilities to have all duties commuted into an annual money payment. Wisconsin is illustrative of a group, the law of which reads that the permit shall be "held under all the terms and limitations of this act.'" Professor Dillavou added that in this latter instance the courts have construed the law to mean that each permit is to be like every other permit, the consequence being that all burdensome provisions are eliminated and no new ones may be added.

Fast Schedules Result of Training

In his paper on the advantages of fast schedules, presented at the afternoon electric railway session, E. J. McIlraith, staff engineer Chicago Surface Lines, urged that a company need not wait to secure new equipment, or to widen the car doors, or to change the motors, or in fact undertake any other major and expensive alteration in order to improve operating conditions. "Usually," according to Mr. McIlraith, "remarkable improvement in speed may be obtained with no other change than training and supervision of the operating force. This means training of the entire organization from the manager down, so as to have each one working actively to discover ways and means of eliminating waste of time, and carelessness in the operation." An abstract of Mr. McIlraith's paper will appear in an early issue.

The subject of noise reduction and car heating was treated in a paper presented by H. H. Adams, superintendent of shops and equipment, Chicago Surface Lines. Concluding a summary of improvements in car equipment in which the substitution of aluminum alloys for heavier metals was discussed, Mr. Adams opined that while these improvements have all had their individual effects, collectively they have exerted an equally important influence on the problem of noise reduction. "Reduction of unsprung weight, gears that run in an oil bath, the elimination of the usual brake rigging and insulation from vibration," Mr. Adams added, "are all important factors in securing quiet operation."

F. L. Reardon, assistant treasurer, East St. Louis & Suburban Railway, in outlining certain short cuts in accounting practices with special reference to motor coach accounting, described in some detail the mechanical handling of fares, the savings which had accrued from the use of ticket issuing cash registers, and the methods employed in supplying itemized pay cards to the trainmen, and bus employees.

R. F. Palmblade, division manager Illinois Power & Light Corporation, Peoria, was elected president of the Illinois Electric Railways Association for the ensuing year.

COMING MEETINGS OF *Electric Railway and Allied Associations*

March 30—Executive Committee American Electric Railway Association, 292 Madison Avenue, New York, N. Y.

April 6 — Metropolitan Section, A.E.R.A., 39 W. 39th Street, New York, N. Y.

April 25-27 — American Welding Society, annual meeting, 33 West 39th Street, New York, N. Y.

April 26-28—Missouri Association of Public Utilities, Jefferson City, Mo.

May 2-5 — Southwestern Public Service Association, Dallas, Texas.

May 6-12—Union Internationale de Tramways, de Chemins de Fer d'Interet Local et de Transports Publics Automobiles, biennial meeting, Rome, Italy.

May 9-10—Central Electric Railway Master Mechanics' Association, Erie, Pa.

June 6-8—Canadian Electric Railway Association, annual convention and exhibits, Toronto, Canada.

June 20-27 — American Railway Association, Div. 5—Mechanical (including former activities of the Master Car Builders' Association and the American Railway Master Mechanics' Association), annual convention and exhibit, Atlantic City, N. J.

June 21-22 — American Railway Association, Motor Transport Division, Atlantic City, N. J.

June 28-29—Central Electric Railway Association, Cedar Point, Ohio.

July 8-12—Public Utilities Advertising Association and International Advertising Exposition, Detroit, Mich.

July 25-27—Electric Railway Association of Equipment Men, Southern Properties, Cincinnati, Ohio.

July 27-28—Central Electric Railway Accountants' Association, Detroit, Mich.

SEPT. 22-28, 1928

American Electric Railway Association, 47th annual convention and exhibit, Cleveland, Ohio.

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News of the Industry

Relief Measure Voted Down in St. Paul

For the third time the voters of St. Paul, Minn., on March 13, turned down an enabling act amendment to authorize the Council to grant the St. Paul City Railway relief from certain costs which would have brought the return on the company valuation nearer to the 7½ per cent figure fixed by the Minnesota Railroad and Warehouse Commission as reasonable. It is expected the railway will now press a hearing before the commission on its application for an increased fare over its present 8-cent cash rate.

At two previous elections the proposed amendment was not put strongly before the voters, but the rejection on March 13 was in the face of a determined agitation by citizens to prevent a higher rate of fare in St. Paul than in Minneapolis. The relief intended to be afforded covered paving between tracks, cleaning, sprinkling and snow removal, etc. The saving to the company was estimated at $200,000 a year. On the other hand, it was estimated by the committee that an increase of 1 cent in the fare will cost the patrons of the cars $638,000 a year.

The net return at present to the St. Paul City Railway is estimated at 4.75 per cent as against 6.1 per cent in Minneapolis with the same rate of fare.

To pass the amendment needed 60 per cent of the vote cast at the election. The final figures were 28,077 to 29,836.

Franchise Suggestions Sought from Jacksonville Company

After lengthy discussion as to the factors that should enter into a franchise for the Jacksonville Traction Company, Jacksonville, Fla., the City Council voted unanimously to invite Peter O. Knight, Tampa, general counsel for the Stone & Webster interests in Florida, to prepare drafts of a franchise that would be acceptable by the company for comparison with the proposed franchise drawn by the local citizens' committee. Mr. Knight maintained that several of the provisions of the franchise draft that has been advanced for acceptance were restrictive and illegal. He said all that the Jacksonville Traction Company wants is "the right to live, a fair valuation set and a fair return on the investment."

Mr. Knight stated that Jacksonville alone presented opposition to his terminable permit bill in the last legislature and he distributed copies of a letter explaining the measure to every councilman. The letter states that the bill aims to eliminate the 30-year period of limitations for the granting of franchises by municipalities and would give the municipalities the right to acquire the property of a utility at the termination of a franchise.

The simplicity of the franchise under which the Tampa Electric Company is operating was stressed by Mr. Knight. It allows the company to operate for 99 years and exempts the concern from payment of corporation or franchise tax on equipment. This agreement has proved satisfactory to the people of Tampa, he said.

Paving Bill Lost in New York

Admitting that he could not muster the votes in his senate public-service committee to report his bill to relieve electric railways in New York State of a substantial portion of their present paving obligation, Senator Warren T. Thayer, father of the so-called compromise proposal, indicated on March 18 that he had abandoned all hope for the legislation. The Thayer bill was the result of conferences between representatives of the cities of the state and spokesmen for the organized railway interests.

The companion bill by Assemblyman D. Mallory Stephens of Putnam County now lies in rules committee of the lower house, where it bids fair to remain.

Appreciation of Toronto Service

THERE can be no doubt that D. W. Harvey, general manager of the Toronto Transportation Commission, and those associated with him have given to Toronto one of the finest street car services in the world. . . . Most of the complaints today arise from overcrowding in cars during rush hours. The remedy for this lies more with employers of labor than with the Transportation Commission. If office hours were "staggered," as has been suggested, much of the congestion on the street cars would be eliminated. It needs to be remembered by those who complain that the "rush-hour" problem is not peculiar to Toronto. It has taxed the best brains of transportation experts in every city, and has never yet been adequately solved. That the system under Mr. Harvey's management is giving an infinitely superior service to that in the majority of other cities there can be no doubt. With one or two difficulties ironed out, it will rank with the best in the world.—*Toronto Globe.*

Old Matters in Toledo Must Be Cleared Up

Mayor W. T. Jackson of Toledo, Ohio, recently insisted that all "unfinished matters" in connection with the Community Traction Company situation be cleared up under the Milner ordinance before there is talk of a new plan of operation. Company officials have agreed to this.

The power rate is one matter that has never been agreed upon definitely due largely to the fact that it is a contract between the Community Traction Company, and the Toledo Edison Company, identical in ownership and control to all practical purposes. Court action was tried at one time but the courts held that the Public Utilities Commission of Ohio alone had jurisdiction and no conclusion has ever been reached before that body. Whatever settlement is reached on power will be retroactive to July, 1924.

Another matter to be cleared up is the paving obligation of $187,500 with interest which was acknowledged due the city when the ordinance was adopted and accepted.

The Mayor has indicated that with these two matters arranged some new plan may be worked out which will give the company substantially what it desires—regulation of independent bus operation so that it may co-ordinate public transit in Toledo and put the financial structure of the company on a sound basis. Company officials contend that no change can be made in the valuation agreed upon at the time the Milner ordinance was adopted.

City representatives believe that the management should bring in new capital to bolster up the property and restore the value back of securities outstanding. A plan of this kind was tentatively agreed upon in the basis of agreement reached last summer before the so-called Dotson ordinance was drawn. That effort has now been laid aside apparently because it did not meet the ideas of the board of control.

Framing Wage Demands in Scranton

Employees of the Scranton Railway, Scranton, Pa., voted recently to ask for an increase of approximately 5 cents an hour and modification of several clauses in the present working agreement. The present one-year agreement expires on March 31. Last April the men were granted an increase of 1 cent an hour in all departments. This provided for a scale in cents per hour as follows: first three months, 57; next nine months, 62; after one year, 65, with an 8-cent differential for one-man operation.

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Suit in Madison Settled

The suit in the Superior Court against the officers of the Madison Railways, Madison, Wis., has been settled by the payment of a fine. This suit arose out of an item of $73,000 which F. W. Montgomery, president, loaned to the company and subsequently forgave in 1921. In 1924 the board of directors by a resolution, immediately typewritten in the minute book of the company where it was open to inspection by the auditors of the Railroad Commission, offered to repay this amount as and when Mr. Montgomery might ask for it. This resolution was not regarded as creating an obligation of the company in the sense that it should be entered on the account books. Payments were made in 1925 and 1926, and these payments were duly entered on the account books of the company and reported to the Railroad Commission. An official statement says:

There was no attempt at concealment of the action of the board of directors, and no attempt to mislead anybody. Everything was open and aboveboard. The failure to report the item was at most a technical violation, and even that is subject to a difference of opinion.

The litigation in the Superior Court was, however, affecting the credit of the company, and the associates of F. W. Montgomery on the board of directors, and other friends, felt that the preferred stockholders and other investors in the securities of the company might suffer damage and loss unless this litigation was settled at once. For this reason alone the suits were settled and the fine paid.

During all of the time that the present management has had control of the Madison Railways it has been honestly and efficiently conducted. The credit of street railways has not been good for many years, and F. W. Montgomery has had to produce most of the money needed by the company. He has carried the burden. The city has received better railway service than any other city of its size in the United States. We shall continue to render this service in the knowledge that we have done no intentional wrong.

Short Extension of Eastern District Subway

The Transit Commission has informed the New York Rapid Transit Corporation (B.-M.T.) by letter that it had determined upon an extension of the Fourteenth Street-Eastern District Subway from its present terminus in Manhattan to a point between Eighth and Ninth Avenues, Manhattan, where a connection may be made for exchange of passengers with the existing Seventh Avenue subway, and with the Eighth Avenue subway now being constructed.

The extension will constitute a two-track underground railroad, beginning at a point in West Fourteenth Street, Manhattan, between Sixth and Seventh Avenues, where a connection can be made with the Fourteenth Street-Eastern line now in operation, and extending thence westerly under and along West Fourteenth Street to a point therein between Eighth and Ninth Avenues, including a station, to be centered approximately at Eighth Avenue. The extension is a very short one, not more than several blocks, but it would be of inestimable benefit in providing access to the transit lines on the west side.

W. S. Menden, president, in a letter to the commission on June 23, 1926, indicated that the railroad would acquiesce in the extension.

Homer Loring Helps Employees

Homer Loring, chairman of the board of the Boston & Maine Railroad, accepted no compensation from the Boston & Maine Railroad during the four years in which he directed the work of the road's rehabilitation. In accepting his resignation recently the board of directors voted him $100,000, which Mr. Loring has accepted only in order to establish a fund, "to be administered by trustees for the general good of all employees of the Boston & Maine."

Mr. Loring is best known to electric railway men as the former chairman of the trustees of the Eastern Massachusetts Street Railway. As a restorer and re-organizer of faltering enterprises Mr. Loring has had many conspicuous successes. He brought the Des Moines, Fort Dodge & Southern Railroad back to solvency and did some notable work in the revival of the Saginaw Traction Company in Michigan.

Trial of Higher Fare on Ohio Line

The right to charge a 10-cent fare between Dover and New Philadelphia beginning April 11 has been granted the Northern Ohio Power & Light Company. This rate of fare authorized by the City Council of Dover, Ohio, is to continue until the expiration of the company's franchise between the two towns Nov. 9, 1928. The change is made to enable the company to determine whether the increase would justify the company's continuing service between the two towns after that date. Heretofore the fare has been 5 cents between the cities. The company formerly had two lines operating between Dover and New Philadelphia. One of the lines was abandoned several months ago and bus service installed.

Wage Conferences in St. Louis

Conferences are being held by the Amalgamated Association at St. Louis, Mo., on the wage demands of the 4,500 union employees of the St. Louis Public Service Company. The union has asked for a sixteen-months contract and an increase of 5 cents an hour for the 3,500 motormen and conductors and increases of from 5 to 10 cents an hour for shopmen, mechanics and maintenance-of-way workers.

Would Sell Three Tokens in Omaha

The Omaha & Council Bluffs Street Railway, Omaha, Neb., has asked the Nebraska Railway Commission for authority to sell three tokens for 20 cents. The present requirement is that no smaller number than six tokens may be sold, and the commission fixed the rate at 40 cents. This is the equivalent of three tokens for 20 cents. However, the commission's finding, made two years ago, stated that the company needed every cent of revenue possible, and that to offer three tokens for 20 cents would result in a large decrease in the cash fares. Patrons are understood to have suggested that more persons would ride if they could invest only 20 cents at a time.

Increase on Warren & Jamestown

The Public Service Commission on March 19 authorized the Warren & Jamestown Street Railway, operating between Jamestown and Warren, Pa., to file a new schedule effective on one day's notice, increasing its mileage rate in New York from 2½ to 3 cents a mile and providing for fourteen zones, instead of eleven, with a fare rate of 5 cents in each zone. Seven of the fourteen zones are in New York State and the remaining seven in Pennsylvania. A single ticket-book rate of 56 coupons for $2.50 good for use by a purchaser and the members of his family without time limit and certain special one-way tickets and school commutation ticket rates have been authorized.

Present fares are based on a rate of 2½ cents a mile. The company asked the right to establish a basic rate of 3 cents. There are now eleven 5-cent fare zones covering the 22-mile distance between Jamestown and Warren which it asked permission to increase to fourteen.

Evidence submitted before the commission showed a decline in operating revenues during the past six years. Commissioner Pooley in a memorandum says the revenues of the company have steadily declined since the construction of the Jamestown-Warren highway. There were 753,505 passengers carried in 1920 and 419,987 in 1927. The revenue from passengers dropped from $150,701 in 1920 to $87,112 in 1927, or approximately 40 per cent. Freight revenues declined from $23,693 in 1920 to $4,529 in 1927.

The evidence showed that under the proposed new rates, and based on no further decline in traffic, there will be approximately a 20 per cent increase in passenger revenue. The commission further found that under the new rates and provided the company carried the same number of passengers in 1928 that it did in 1927, there would be an estimated increased operating income of $25,146, or a return of about 5 per cent on about $500,000 invested in giving service.

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Senate Fails to Reappoint J. J. Esch

John J. Esch of Wisconsin, who had served on the Interstate Commerce Commission for six years prior to his renomination by President Coolidge last December, lost his fight for confirmation on March 16 when the Senate, after five hours of debate behind closed doors, rejected the appointment by 39 to 29.

The opposition was led by Senators from the Southern coal states. It was based almost entirely on the commissioner's change of attitude in the long pending contest between the mines of Pennsylvania and Ohio and those of West Virginia, Kentucky, Tennessee and Virginia, for the lake cargo trade.

The commission recently rejected a petition of Southern railroads for a reduction of 20 cents a ton in lake cargo coal transportation charges.

After the executive session Senator Neely, Democrat, West Virginia, said the vote "is a very emphatic warning that the Senate will not tolerate the packing of these important commissions by President Coolidge in favor of Pennsylvania or any other section or in favor of any particular interests of the country."

In a minority report from the Interstate Commerce Committee Senator Fess declared that from the standpoint of ability and experience Mr. Esch was "eminently fitted for the position and from the basis of honesty and integrity he is equal to the best in public life."

The minority report called attention that in between his two votes Mr. Esch, like all other members of the commission, had the benefit of "extended further hearings, a mass of further evidence which embraced some 2,000 pages, and two days of oral argument before the full commission."

Fare Hearing in New York Postponed

Because of the illness of Samuel Untermyer, special consuel for the New York Transit Commission, the sitting of the federal statutory court, scheduled for March 22 to hear further argument on the application of the Interborough Rapid Transit Company for a 7-cent fare was postponed on March 21 to March 29. The city's argument will then be presented by former Controller Charles L. Craig. George L. Ransom, special counsel for the Interborough, will make a reply argument.

Both Mr. Untermyer and Mr. Craig have declared that there is no conflict between them regarding the policy to be pursued in combating the Interborough's increased fare suit. It was pointed out that Mr. Untermyer had upheld from the outset the validity of the 5-cent fare contract between the city and the Interborough and that Mr. Craig was merely concentrating upon that phase of the entire case. The intricate questions of valuation and fair return upon capital invested, it was indicated, would be handled by Mr. Untermyer.

Franchise Talk in Kansas City, Kan.

Tentative plans of the City Commission of Kansas City, Kan., for the creation of a board of control to have jurisdiction over all transportation have virtually been abandoned following discouraging investigations of the cost of engaging technical experts as advisors.

It was suggested at the recent meeting of the City Commission that the body wait until the Wyandotte Railway requests a franchise as a solution to the problem of satisfying riders. The franchise of the predecessor company expired in 1922.

Interchanging System Between Illinois and Indiana

The Illinois Traction System is considering plans for a hook-up of its lines with the Terre Haute, Indianapolis & Eastern interurban lines between Danville, Ill., and Crawfordsville, Ind., utilizing either electric lines or buses. While the connecting link is intended primarily for convenience of shippers the line will be available to passenger traffic and give Illinois and Indiana an interchanging freight and passenger system.

Safety Rewarded at Little Rock

Twenty-five of the 110 operators regularly employed in the railway service of the Arkansas Power & Light Company at Little Rock, Ark., completed 1927 without a chargeable accident. This was announced at a recent safety meeting at which cash prizes were distributed to the successful competitors in the accident prevention campaign. Thirty-three men participated in the prize money.

The first team of eleven operators received $150. The second received $100, and the third $50. Seven teams failed to place.

The system of prizes, which was used last year as an experiment, is not being followed this year. In 1927 the men were grouped into teams in the accident prevention work, and the team worked as a unit. The purpose of this was to stimulate co-operation and emulation in accident prevention records. For this year the plan specified an advisory council consisting of various department heads.

Car on Exhibition in Macon

Residents of Macon, Ga., were invited in a newspaper advertisement to inspect the first of twelve new cars for the Macon Railway & Light Company on March 4 and meet a representative on duty to explain the safety devices.

Right of Hartford Under Tucker Grant Upheld

Chief Justice George W. Wheeler in the Supreme Court at Hartford, Conn., has handed down a decision against the Connecticut Company and upheld the city of Hartford and its right to collect 2 per cent of the gross fares paid to the railway within the city limits, as established by the Tucker Grant in 1894 through an agreement between the Connecticut Company and the city. This was for the privilege of electrifying and extending its railway lines in Hartford.

The Connecticut Company paid the tax from 1894 until 1922. It is not expected the company will appeal to the United States Supreme Court as no constitutional question is involved.

In the lower court last year Judge Jennings held the tax of 2 per cent was illegal. The Supreme Court in answer to this says:

> The payment provided for was not a charge levied by government upon the Connecticut Company's property for governmental purposes, but its payment of an obligation created by its voluntary action. The provision for payment of a percentage of the gross receipts does not fall within any known definition of a tax; it is neither proportional nor compulsory in character, but voluntary and individual, and its very attribute is antagonistic to the normal attributes of a tax.

The tax originated in 1893 when the Connecticut Company's predecessors sought to electrify and extend the Hartford lines. In 1894 the Tucker grant extended the right to the company with the understanding 2 per cent of the gross fares would be paid into the city treasury yearly. The railway agreed to the plan.

The Supreme Court in reviewing the case found that the city had the right to make such an agreement under its charter, and that the Connecticut Company could not by its long payment of the tax, challenge the validity of that agreement. The court also said the Connecticut Company could not have extended its lines without the consent of the Common Council at that time. The agreement then was made so that it could. The court said:

> The payment provided for was not a charge levied by government upon the company's property for government purposes, but the payment of an obligation created by its voluntary action.

Power Contracts to Boston Edison

Charles L. Edgar, president of the Edison Company, Boston, Mass., says that since the close of the fiscal year, contracts have been entered into with the Boston & Maine Railroad for its entire electric service and steam heating requirements for a long term of years, and for about 75 per cent of the electricity needed for the Boston, Revere Beach & Lynn Railroad, now being equipped for electric operation under plans outlined previously in these pages.

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$10,000 in Prizes Offered for Traffic Solutions

With the view of determining the best means of solving the constantly growing traffic problem, *Nation's Traffic*, a monthly publication issued in St. Louis and devoted to street and highway traffic, is conducting a contest in which $10,000 is offered for ideas on the subject.

How to divert traffic into its most useful channels as well as how to administer properly the various functions of traffic control are among the purposes of the nation-wide quest for ideas. Fifteen cash awards are offered. First prize will be $2,500 and second $1,500. The next three will be awards of $1,000 each, with the sixth prize of $750 and the other nine ranging in amounts from $100 to $500.

The subjects are as follows: Text for uniform traffic ordinance, plan for regulating movement of traffic with signals and signs, plan for the solution of municipal parking problems, typical city plan to better traffic conditions, curriculum for adult education, plan for handling traffic violators, plan for regulation of pedestrians, curriculum for juvenile education, plan for reducing railroad crossing hazards, plan for traffic police organization, street lighting plan to aid traffic, plan for motor vehicle registration and identification, and plan for handling tourists.

There is to be a bonus of $100 for the neatest and most carefully prepared manuscript and another of the same amount for the most helpful suggestion or idea.

Another Boston "L" Program of Legislation

The death-knell of Governor Fuller's program for the extension of public control of the Boston Elevated Railway has been sounded on Beacon Hill. All possibility of the return of the road to private operation also seems to have vanished. There apparently remains now only the public ownership legislation, or a policy of letting the entire problem go over for another year.

In this connection the defection of Charles C. Warren of Arlington, up to this time foremost exponent of extending public control to the camp of those advocating public ownership, is regarded as significant. He first tried unsuccessfully to have a resolve recommended which would provide for the appointment of a special legislative committee by the governor, consisting of the president of the Senate and two Senators and the speaker of the House and four representatives, to prepare a public ownership bill.

Senator Warren then declared that after four years of constant effort to provide for an extension of public control he was convinced that no such bill could ever be passed which would be accepted by the stockholders. He said he opposed a return of the road to private ownership as the State would be giving up its option right of the 1918 public control act, which was of tremendous value to the district and to the state.

After considerable discussion a motion was made that the two committees, acting jointly, vote to report the public ownership bill.

Southern Ohio Company Granted Franchise

A fifteen-year franchise has been granted the Southern Ohio Public Service Company, Zanesville, Ohio, through the village of Bexley, Ohio. The company is permitted to abandon its Mound Street tracks through Columbus.

Provisions of the franchise include a 10-cent fare into Columbus from Bexley. The company is to use the same tracks as the Columbus Railway, Power & Light Company as far as Drexel Avenue, where it will continue to Pleasant Ridge Avenue and from there use its own tracks. Bexley is just outside the eastern boundary of Columbus.

Franchise Sought for Improvements in East St. Louis

The East St. Louis Railway is seeking a franchise to take over part of the tracks of the East St. Louis & Suburban Railway so that it may be able to cooperate in the construction of a subway to carry State Street under the tracks of the Terminal Railroad belt line at 21st Street in East St. Louis, Ill. The tracks of the East St. Louis Railway now end on State Street near Nineteenth Street. The franchise from that point eastward is held by the East St. Louis & Suburban Company.

If the bill, presented to the East St. Louis City Council, is passed it must be submitted to the people for ratification at the general city elections to be held on April 3. Convenience and safety to patrons are the considerations in this project.

The East St. Louis City Council is also considering a proposed franchise for the East St. Louis, Columbia & Waterloo Railroad to build new tracks in order to enter East St. Louis by a circuitous route instead of coming direct down Broadway on the tracks divisions of the East St. Louis Railway used by the Broadway and Alta Site Company. If passed this bill will also go to a vote of the people on April 3.

A Radio Treat by Railway Men

THE Cleveland Railway chorus and the Pittsburgh Railways' band will broadcast over KDKA Saturday night, March 31, at 10 o'clock p.m. There are 150 in the chorus and 50 men in the band. The arrangements were made by the Westinghouse Electric & Manufacturing Company.

Transit Legislation for New York City Defeated

As the special correspondent of the New York *World* at Albany expressed the matter in a dispatch to that paper dated March 22, the 151st session of the New York State Legislature performed that day what many people consider the most notable act of its career. It adjourned sine die at 5:56. In a session in which many bills went down there was defeat for all New York City transit legislation, except two bills sponsored by Assemblyman Moran, under which it is hoped to add somewhat to the speed of subway construction by making more prompt payment for property which may be condemned.

The manner in which some of these measures was handled had all the aspects of a political gesture. Thus Minority Leader Maurice Bloch made a motion on March 22 to discharge the rules committee from consideration of the transit bill to enable the city of New York to acquire and unite into one system all rapid transit lines in the greater city. The motion was defeated. This bill, presumably prepared by Samuel Untermyer, was not introduced until a very late date, almost on the eve of adjournment. It has never been supported by any statement from Mayor Walker of New York asking for its passage. In the Senate the bill was amended on March 19 to take care of a few technical errors which could have been corrected by the committee on revision.

The bill provided for a 5-cent fare so long as the city of New York wished to make up by appropriation any operating deficit that might ensue from management by a board which would be practically the city government of New York. In reality the measure would have allowed the city of New York to go into the rapid transit business.

Employees Charged With Neglect in Key System Accident

Two Key System Transit Company employees, Edward Dyson, chief engineer, and Harry E. Hill, both of the ferryboat Peralta, have been cited for neglect by steamboat inspectors who conducted an inquiry into the accident of Feb. 17 when the bow of the craft suddenly dipped and spilled 30 passengers into San Francisco Bay. Five were drowned. The two accused men face trial on March 28 before the steamboat inspection board. No criminal action is implied in the citation, but the two men will lose their licenses if found guilty.

The specific charge is that the two officers failed to notify Capt. W. H. Melsome of the Peralta that the forward ballast tank was filled at the time of the accident. Both men told inquisitors at the hearing that the tank was not filled. They deny the negligence charges.

The company's suggestion that the accident was caused by an uncharted declivity in the bottom of the bay has been discounted by soundings, United States investigators declare.

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Recent Bus Developments

Buses Proposed for Use in Alameda

William J. Locke, City Attorney of Alameda, Cal., has announced that the Key System has notified Alameda that it has no intention of putting tracks through the tube or repaving its right-of-way along Webster Street. The company also, according to Mr. Locke, will apply within the next few days to the Railroad Commission to abandon its railway franchises in Alameda. Alameda county officials said recently that it is understood the Key System intends to substitute bus lines for its Alameda railway.

At a straw vote held early in February the citizens of Alameda registered their desire in favor of the railway system. A representative of the railway said the company has not filed an application with the state commission and that officials are not ready to make a statement.

Federal Court Has Jurisdiction in Muncie Case

A mandate from the circuit court of appeals at Chicago has been handed to the clerk of the federal court in Indianapolis reversing the decision of Judge Robert C. Baltzell in a suit of the Equitable Trust Company of New York, which sought to enjoin Sumner Denny and others from operating bus lines in Muncie, Ind. Judge Baltzell, who first heard the case, decided the federal court had no jurisdiction.

The complaint set out that the trust company held a mortgage as security for $5,000,000 in bonds issued to the Union Traction Company of Indiana in 1899. This mortgage, the plaintiff said, established the right of the trust company to jurisdiction over railway company franchises for bus operation in Muncie. The suit alleged that the defendants in establishing a competitive line in Muncie failed to obtain a certificate from the Indiana Public Service Commission. According to the circuit court decision the Indianapolis federal court has the right to hear the case.

Detroit-Pittsburgh Bus Permit Sought

Application has been made to the Ohio Public Utilities Commission for permission to establish the first interstate bus line from Detroit, through Toledo and Akron, to Pittsburgh by the Northern Interstate Transit Company, a subsidiary of the Northern Ohio Power & Light Company. Hearing on the petition has been set for April 5. The new bus line as proposed would make three trips daily each way between Detroit and Pittsburgh and would offer fare at rates below railroad transportation between those points. The proposed running time between Detroit and Pittsburgh is eleven hours and the proposed route extends from Detroit through Toledo, Elmore, Fremont, Norwalk, Medina, Akron, Alliance, Salem and East Liverpool to Pittsburgh. It is planned to use six coaches each carrying 24 passengers. Permission has been secured in Michigan to get out of Detroit to Toledo. Permission has also been secured for entrance into Pittsburgh. All that remains is authority from the Ohio commission and apparently there is no objection to this.

Extension of Bus Line in Los Angeles

The Los Angeles Railway has been authorized by the California Railroad Commission to extend its Melrose Avenue bus line in Los Angeles County from the intersection of Melrose and Western Avenues to the highway known as La Cienega Boulevard.

Bus Service Increased Following Ohio Abandonment

The Ohio Public Utilities Commission has granted the Northern Ohio Power & Light Company permission to discontinue interurban passenger service between Canton and Akron and to abandon its tracks between Canton and North Canton. Freight service between North Canton and Akron and passenger service between Akron and Springfield Lake will be continued. Bus service between Akron and Canton supplied by the Cleveland-Akron-Canton Bus Company, a subsidiary of Northern Ohio Power & Light Company, which has been operating for several year, will be increased. The commission's permit is to take effect not later than May 1, 1928. The line was built a little more than a quarter of a century ago. During all that period the company has maintained hourly schedules between the two cities.

Freight from Canton will be routed over the Stark Electric to Alliance which it will be switched to the Northern Ohio tracks and taken into Akron via Ravenna. Passengers will be transported from Canton to Akron by bus.

To handle the increased business, the Stark Electric plans to close its substation at Louisville, between Alliance and Canton, and have two substations one just east of Canton and one just west of Alliance. Traffic between Canton and Louisville, a distance of 5 miles, will require twice the number of interurban passenger cars. Extra track is being laid to accommodate the additional carriers.

Opposition to South Bend Feeder Bus Project

The recent application of the Chicago, South Bend & Northern Indiana Railway for a permit to operate feeder bus service in west South Bend, mentioned in the ELECTRIC RAILWAY JOURNAL previously, was opposed in a petition filed with the Indiana Public Service Commission by the South Bend Motor Bus Company. In the intervening petition the commission was asked to dismiss a petition filed by R. R. Smith, receiver for the railroad, on the ground that the commission has no legal authority to nullify an agreement with the South Bend board of public works, which allows the South Bend Motor Bus Company to operate in this section of the city.

Buses Withdrawn from Woodward Avenue, Detroit

Motor coach service on Woodward Avenue, Detroit, was ordered abandoned by the Detroit Street Railway Commission at a meeting in Mayor John Lodge's office on March 7. This action was taken as a result of the failure to make money and the monthly increasing deficit from its operation.

Del A. Smith, general manager of the system, stated that he would immediately place additional street cars in service to take care of the traffic previously handled by the buses. The number of cars operating to all points on Woodward Avenue will be increased. More cars are to run to the carhouse at the Ford factory, to the Palmer Park run and to the Fair Grounds run, all on the Woodward line.

Woodward Avenue is one of the main thoroughfares over which jitneys are operating in competition with the municipal transportation system. The buses released from this service will enable the department to extend its lines in other sections of the city.

Substitution in Indiana

On petition of William A. Carson, receiver for the Evansville & Ohio Valley Railway, operating electric railway lines from Evansville, Ind., to Henderson, Ky., Mt. Vernon and Grandview, Ind., Judge Elmer Q. Lockyear, of the Vanderburgh County Probate Court at Evansville, on March 16 ordered the suspension of service between Evansville and Henderson and the substitution of bus service by the company. The receiver filed a petition, setting out that suspension of the railway service between Evansville and Henderson was to the best interests of the company and the creditors because the company was losing money daily on the Henderson line.

The court granted the petition and authorized the receiver to borrow $21,000 for the purchase of three buses.

Mr. Carson said the bus route would be through Howell, down the Henderson public highway on the Indiana

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side of the Ohio River to the ferry at the Louisville & Nashville Railroad bridge and across the river. Fares and schedules will be the same as on the railway lines.

The Henderson line of the Evansville & Ohio Valley Railway at present uses a transfer boat on the Ohio River 6 miles above Evansville to take its cars across the Ohio River.

Some time ago the Evansville & Ohio Valley Railway petitioned the Indiana Public Service Commission to permit it to use buses on the Evansville-Mt. Vernon line of the company and this change is expected to be made in the near future.

Priority Rights Questioned in Los Angeles

A petition for re-hearing of the commission's recent order granting the Pickwick Stages System a permit to operate its service between Los Angeles and Venice was filed by the Pacific Electric Railway Los Angeles, Cal., with the California Railroad Commission on March 13. The Pacific Electric protests the finding of the commission that it is not financially so well able to maintain the bus service as is the Pickwick Company, denies that Pickwick is better qualified by experience to operate the line, and contests the priority of the application upon which the permit was granted.

The United Stages, Inc., filed the original application in the matter and subsequently withdrew in favor of the Pickwick Stages. The withdrawal is cited by the Pacific Electric as a reason why its application has priority over that of Pickwick.

Bus Authorization in Massachusetts

The Massachusetts Public Utilities Commission has authorized the Point Shirley Street Railway to operate a bus line in the city of Winthrop, Mass. As planned, the line will run between the Winthrop Beach Station and Point Shirley. The commission has also authorized the railway to acquire, own and operate buses for the transportation of passengers.

Needed Bus Line in St. Louis Under Consideration

The St. Louis Public Service Company is making a survey to determine whether a bus line should be established between Jefferson barracks and Koch Hospital, the St. Louis, Mo., tuberculosis sanitorium south of the barracks. Arthur Stoehr, secretary of the St. Louis bond issue supervisory committee, pointed out to the railway officials that the tuberculosis sanitorium had hundreds of visitors weekly and that the only conveyance was a private bus which was furnishing unsatisfactory service.

Financial *and* Corporate

New Board for West Chester Street Railway

At the annual meeting of the West Chester Street Railway, West Chester, Pa., the following were elected directors for the ensuing year: Eric H. Biddle, John T. Collins, Jr., Franklin P. Jones, Lawrence J. Morris, Edmond W. Palmer, J. V. Pennegar and O. Howard Wolfe.

O. Howard Wolfe, cashier of the Philadelphia Girard National Bank, was elected president and Eric H. Biddle, formerly secretary and treasurer of the company, was elected vice-president and general manager. T. O. Roberts was elected assistant secretary and treasurer.

The West Chester Street Railway is undergoing a financial re-organization, a plan and agreement for the readjustment of the securities of the company having been issued by a security holders protective committee. Up to the present time a large part of all classes of the company's securities has been deposited under the plan and agreement.

$4,400,000 Kansas City Public Service Issue Offered

Improvements to the properties of the Kansas City Public Service Company, Kansas City, Mo., will be partially financed with a portion of the proceeds of $4,400,000 first mortgage 6 per cent bonds offered on March 21 by Halsey, Stuart & Company, Chase Securities Corporation and Newman, Saunders & Company. The bonds were priced at 95 and interest, yielding more than 6.40 per cent. They are dated July 1, 1926, and are due July 1, 1951.

It is explained that of these bonds, $2,534,800 are new bonds, and the proceeds therefrom will be used for capital additions and improvements to the company's property. The balance of the bonds being offered have been previously issued and do not increase the company's funded debt or its interest charges.

The company, with a wholly owned subsidiary, owns and operates the entire railway system in Kansas City and Independence, Mo., and Kansas City, Kans., and a motor bus system in Kansas City, Mo.

Debt in Seattle Diminished

Seattle, Wash., now owes on its municipal railway purchase debt to the Puget Sound Power & Light Company $436,296, not including interest. The debt was diminished $172,966 on March 13 when City Comptroller Harry W. Carroll paid that amount as first installment, with interest included. The remainder will be paid in four equal installments, annually. The payment was made in railway department warrants drawn on a fund that had been enlarged by loans of $550,000 from the light department. Part of the loan was used some time ago to enable the railway to pay operating costs while it accrued funds sufficient to meet the bonded purchase debt installment.

The railway was assessed $401,017 for 1919 by the county assessor but litigation costs and accrued interest have increased the total the railway must pay by nearly $300,000. There was pending a long time in federal court a suit in which the city contested a contract with the Puget Sound company stipulating that the city was to pay three-fourths of the 1919 tax. The company won.

Liberalizing Savings Bank Investments in New York

Without opposition the Assembly of New York has passed and sent to the Governor two of the bills permitting wider latitude in savings banks investments. The first bill permits savings banks to purchase equipment bonds of railroads and the second legalizes investment in the bonds of electric, gas and telephone companies. The provision for investment in utility bonds and telephone issues under stipulated restrictions is made in two subdivisions added to section 239 of chapter 369 of the laws of 1914. Most important provisions in the law follow:

The company must be duly incorporated under laws of the United States for business of supplying electrical energy or gas, and at least 75 per cent of the gross operating revenues of such company must be derived from such business, not more than 15 per cent of such revenues being derived from any other one business; the company must operate under the duly established public service commission or other regulatory body; the company must have the necessary franchises for operation in territory from which 75 per cent of its gross income is derived.

The outstanding full paid capital stock shall be equal to at least two-thirds of the total debt secured by mortgage lien on any part or all of its property; such corporation must have been in successful operation for at least eight fiscal years and must have a satisfactory record for payment of debt service; for a period of five fiscal years earnings must have averaged not less than twice annual interest charges on funded debt; applicable to the period such bonds must be part of an issue of not less than $1,000,000 and must be secured by either a first or a refunding mortgage secured by property owned and operated by the issuing corporation.

Not more than 10 per cent of the assets of any savings bank shall be invested in electric and gas bonds, and not more than 2 per cent of such assets shall be invested in bonds of any one such corporation.

The bill to amend the law on invest-

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ments in bonds and obligations of railroad corporations recognizes the importance of earnings on capital stock, apart from whether such earnings have been paid out in dividends. In the old law it was provided investment might be made in bonds of railroads which, with other requirements, met the obligation that "at no time within five years next preceding the date of any such investment such railroad corporation shall have failed regularly and punctually to have paid in dividends to its stockholders during each of said five years an amount at least equal to 4 per cent upon all its outstanding capital stock."

The new law contains this provision, with the alternative that the road shall have earned net income of at least 4 per cent during each year of the five. Net income is defined to mean net income as set forth by the accounting regulations of the Interstate Commerce Commission.

Another departure is adding to the legal list bonds issued or assumed by a terminal depot or tunnel corporation, provided they meet the requirements applied to other railroad bonds, and provided the bonds are guaranteed by endorsement, principal and interest, by one or more railroads meeting the provisions of the savings bank law.

Bonds secured by pledge of other railroad bonds as collateral under a trust agreement become legal provided the pledged bonds are themselves legal for such investment; do not mature earlier than the bonds so secured; are not less in par value than the amount of the bonds they secure, and that no substitution or withdrawal of collateral may be permitted.

Equipment trust obligations, maximum amount of which do not exceed 80 per cent of cost of rolling stock purchased, provided the latter is owned by or leased to a road, any of whose bonds are legal, or to a company controlled through majority stock ownership, or a subsidiary whose controlling company guarantees the equipment bonds, provided its own bonds are legal.

Increase in Revenue and Riding

Chicago Surface Lines report increase in gross and residue receipts in 1927. Total rides, including transfers, were 1,585,441,127, while revenue passengers totaled 882,458,647

THE Chicago Surface Lines, operating under temporary municipal permits during the fiscal year Feb. 1, 1927, to Jan. 31, 1928, made further progress in its record of service, traffic and earnings. Gross earnings were $61,624,752, an increase of $451,151 compared with the previous year. This total was the highest in the history of the companies. Operating expenses, including taxes and renewals, were $48,231,496, an increase of $360,006. Residue receipts were $13,393,256, an increase of $91,145. The city of Chicago's share of divisible receipts was $2,500,225 and purchase price of the properties as of Feb. 1, 1928, was $163,917,765. These facts were contained in the fourteenth annual report of the president of the board of operation.

Increase in traffic, which had been maintained for 24 consecutive months, was interrupted in June when there was a decrease, and like conditions prevailed during four later months of the year. Notwithstanding this, the total rides for the year reached 1,585,441,127, an increase of 10,471,225, while the revenue passengers totaled 882,458,647, an increase of 6,208,984 over the previous year. Service was increased during the year to the extent of 3,200,000 passenger car and bus miles. The largest day's business of the year and the second greatest in the history of the companies both in earnings and traffic was Saturday, Dec. 17, when passenger receipts were $199,099, revenue passengers 2,901,195 and total rides 5,090,097. Revenue passengers on an average weekday numbered 2,548,443, which set a new high mark. Average Saturday passengers during the year numbered 2,660,278, and for an average Sunday or holiday, 1,625,365.

The first Chicago Surface Lines bus route was started on Aug. 11, on Diversey Avenue from Crawford Avenue to Laramie Avenue. A new type twin-motor bus seating 40 passengers and equipped with pneumatic tires and air brakes was adopted for this purpose. Public approval was promptly evidenced by requests from various sections of the city for extension of this type of bus service.

The properties have been operated practically on a day-to-day city permit since Jan. 31, 1927, when the franchises expired. The first permit after that date was for six months to July 31, the next four months to Nov. 30, and after that date for one month at a time.

Accompanying this recital of the affairs of the company are some comparisons of the extent of the Surface Lines' system at the end of the first year of unified operation (Jan. 31, 1915) and at the close of the fourteenth year (Jan. 31, 1928).

Items	1915	1928	Per Cent Increase
Gross earnings	$31,966,049	$61,624,752	92.78
Operating expenses	19,889,276	48,231,496	142.50
Taxes	1,439,279	2,900,000	101.49
Operating wages paid	10,560,039	30,280,959	186.75
Total wages paid	12,379,615	32,989,360	166.48
Revenue passengers carried	627,731,550	882,458,647	40.58
Total rides	1,115,312,129	1,585,441,127	42.15
Average fare per revenue passenger	4.99 cents	6.90 cents	38.28
Average fare per ride	2.81 cents	2.84 cents	36.65

A total of $113,741,583 has been paid for public benefits by the companies since the adoption of the 1907 ordinances, divided as follows: For cleaning right of way, including sprinkling and removal of snow and ice, $11,166,425; street paving, $16,671,621; maintenance paving, $6,578,339; general taxes, $35,839,359 (year 1927 estimated); track and overhead removal and replacement on account of sewer installation, etc., $1,890,744; city's 55 per cent proportion of net earnings, $41,595,095.

A new world's record in service was made during the 1927 Christmas shopping season when every car and bus owned by the company was operated in peak load periods on Wednesday, Thursday and Friday, Dec. 21, 22 and 23. This is the second time 100 per cent operation has been attained on a large street car system and the previous record was made also by the Chicago Surface Lines on Dec. 20, 1926.

This use of all equipment in the Christmas peak saved the investment necessary for 200 additional cars, the number usually being overhauled. The cost for each car and car storage would average about $20,000, making a total saved in capital investment of approximately $4,000,000.

The report refers to the supplemental arbitration agreement entered into Dec. 12, under which an award was made on Jan. 21, signed by two new arbitrators following the agreement for arbitration signed July 18, 1927, under which no award was made because of the inability of the two arbitrators to select a third man.

This award covers the period from June 1, 1927, to May 31, 1930. It provides for life insurance effective Feb. 1, 1928, in the amount of $1,000 and $20 a week for sick and accident insurance —also a 1 cent per hour increase in wages starting June 1, 1928, and an additional 1 cent June 1, 1929. It also provides for the payment of $35 to all members of Division 241 in service Feb. 1, 1928, who were in service prior to June 1, 1927, and $12 to those in service Feb. 1, 1928, who went into service between June 1, 1927, and Nov. 1, 1927. The award was approved by the Hon. James H. Wilkerson, Judge, United States District Court, in accordance with the terms of the agreement under which the award was made. The board of operation authorized extension of the life insurance and sick and accident benefits to all other employees, effective Feb. 1, 1928.

Team work on the part of employees directed by the department of accident prevention was largely responsible for a reduction of 12.5 per cent in number of reported accidents. Fatal accidents were reduced more than 14 per cent.

The best record during any fiscal year since 1921 was made in number of car riders and car-miles per accident.

The second annual accident preven-

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tion contest among the various divisions of trainmen closed on Jan. 31, with Lincoln Avenue depot the winner.

Car mileage per pull-in due to equipment failures reached a new high average of 25,884, an increase of about 80 per cent. Compared with the showing for the fiscal year 1924, this is an increase of 424 per cent.

In the past year, 1,624 cars, or 45 per cent of the 3,639 cars owned, were overhauled and painted.

Each motor car on the system traveled an average of 37,593 miles during the year—establishing a new record for passenger equipment.

In spite of an increase of more than 3,100,000 passenger car miles during the year, there was a decrease of more than 8,300,000 kw.-hr. in power used. There was also a reduction of about $28,000 in cost of energy output.

The bus operation installed in August, 1927, as an extension of the railway facilities on Diversey Avenue, both with respect to character of service and type of buses employed, has given great satisfaction to the public. By an order entered Jan. 26, 1928, the Illinois Commerce Commission authorized and directed extension of this service east to Milwaukee Avenue and west to Narragansett Avenue, and by the same order authorized and directed bus service as an extension of the Belmont Avenue line between Central and Narragansett

EARNINGS, EXPENSES AND DIVISION OF RESIDUE RECEIPTS OF CHICAGO SURFACE LINES FOR YEAR ENDED JAN. 31, 1928, COMPARED WITH PREVIOUS YEAR

Earnings:	1928	1927
Passenger cars	$60,892,995	$60,436,705
Chartered cars	4,837	5,347
Newspaper cars	16,608	16,276
Freight earnings	888	5,039
Hospital car service	2,088	3,742
Advertising	290,263	281,837
Rents of buildings	174,753	160,885
Sales of power	98,041	108,210
Interest on deposits	134,438	132,366
Miscellaneous	9,838	23,188
Gross earnings	$61,624,752	$61,173,601
Expenses:		
Way and structures	$3,006,276	$2,984,484
Equipment	4,247,920	4,188,633
Renewals	4,929,980	4,893,888
Power—maintenance	387,445	386,086
Power—operation	3,683,540	3,638,283
Conducting transportation—trainmen	21,789,269	21,485,750
Conducting transportation—other	3,246,443	3,214,031
Traffic	120,177	123,433
General and miscellaneous—damages	1,848,742	1,936,202
General and miscellaneous—other	2,071,698	1,620,696
Taxes	2,900,000	3,400,000
Total expenses	$48,231,495	$47,871,489
Residue receipts	*$13,393,256	*$13,302,111
Divided:		
Chicago Railways—60 per cent	*$8,035,953	*$7,981,267
South Side Lines—40 per cent	*5,357,302	*5,320,844

* Includes city's 55 per cent of net divisible receipts, as defined by ordinances.

STATEMENT OF TRACK MILEAGE OF COMPANIES INCLUDED IN CHICAGO SURFACE LINES SYSTEM

	Total Miles Single Track 1-31-27	Extensions 1927	Abandoned 1927	Net Extensions 1927	Total Miles Single Track 1-31-28	*Reconstructed 1927
Chicago Railways	594.80	2.30	0.01	2.29	597.09	23.35
Chicago City Railway	339.60	0.10	0.69	†0.59	339.01	14.86
Calumet and South Chicago Railway	127.97	0.08	....	0.08	128.05	2.47
Southern Street Railway	17.45	....	....	....	17.45	.....
Total	1,079.82	2.48	0.70	1.78	1,081.60	40.68

* Includes track taken up and replaced account of sewers and special straight track renewals. † Decrease.

TABLE OF INCREASE IN RIDING ON CHICAGO SURFACE LINES DURING PAST SEVEN YEARS

Year Ended	Weekday Average	Saturday Average	Sunday Average*	Total for Year
Jan. 31, 1928	2,548,443	2,660,278	1,625,365	882,458,647
Jan. 31, 1927	2,521,897	2,668,342	1,632,844	876,249,663
Jan. 31, 1926	2,424,194	2,507,004	1,631,484	842,201,453
Jan. 31, 1925	2,373,114	2,512,121	1,614,823	830,151,540
Jan. 31, 1924	2,354,139	2,521,487	1,623,414	824,850,103
Jan. 31, 1923†	2,204,425	2,356,385	1,563,911	762,629,211
Jan. 31, 1922	2,129,217	2,251,293	1,560,310	750,515,622

* Includes holidays. † Trainmen's strike, Aug. 1 to 6, 1922, inclusive.

RESERVE FOR RENEWALS AND SPECIAL RESERVE FOR RENEWALS AND EQUIPMENT CHICAGO SURFACE LINES COMPANIES FOR FISCAL YEAR ENDED JAN. 31, 1928

Reserve for Renewals:	Chicago Railways	Chicago City Ry.	C.& S.C.Ry.	Total
Balance in reserve at Feb. 1,'27	$9,568,220	$5,278,957	$348,592	$15,195,770
Sale of unnecessary property and salvage	83,840	49,478	4,677	137,996
Interest earned	292,105	161,168	10,630	463,904
Balance in reserve at Feb. 1, 1928	$9,944,166	$5,489,603	$363,900	$15,797,671
Special Reserve for Renewals and Equipment:				
Balance in special reserve at Feb. 1, 1927	$113,270	$235,613	$52	$348,936
8 per cent of gross earnings	2,958,308	1,671,697	300,294	4,930,300
Interest earned	9,479	11,603	940	22,023
Total	$3,081,058	$1,918,913	$301,288	$5,301,260
Less: Expended for renewals	$2,448,500	$1,457,134	$267,981	$4,173,615
Expended for special equipment:				
New passenger cars	145,081	7,325	.....	152,407
New buses	57,616	.....	.....	57,616
Expended for track extensions	213,376	17,720	.....	231,097
Expended for track reconstruction	.....	142,847	.....	142,847
Total expended	$2,864,575	$1,625,028	$267,981	$4,757,584
Balance in special reserve at Feb. 1, 1928	$216,483	$293,885	$33,307	$543,675
Total of balances at Feb. 1, 1928	$10,160,649	$5,783,489	$397,207	$16,341,347

Under orders of the Public Utilities Commission of Illinois and of its successor, the Illinois Commerce Commission, $8,337,705 has been expended since July, 1920, out of the "Special Renewal and Equipment Fund" for new equipment and for track extensions and reconstruction.

Although the property acquired by these expenditures is functioning as part of the operating plant, it does not appear in the Capital Accounts of the companies inasmuch as the Commission orders provide that such expenditures shall not be carried to capital account "unless and until the sum or sums thus expended have been paid into the renewal and depreciation fund."

The balance, $16,341,347, in "Reserve for Renewals" and "Special Reserve for Renewals and Equipment" is a cash balance and is on deposit in various banks.

CAPITAL EXPENDITURES BY CHICAGO SURFACE LINES FOR THE FISCAL YEAR ENDED JAN. 31, 1928.

	Chicago Railways	C. C. Ry.	So. St. Ry.	C.& S.C.Ry.	Total
Purchase price at Feb. 1, 1927	$94,438,640	$55,776,788	$1,801,278	$11,729,148	$163,745,856
Capital expenditures during year	110,192	31,308	1,117	33,102	175,720
15 per cent on same	16,528	4,696	167	4,965	26,358
Increase in fluctuating assets	*17,239	*11,492	.....	.....	*28,732
5 per cent on same	*861	*574	.....	.....	*1,436
Purchase price at Feb. 1, 1928	$94,547,260	$55,800,725	$1,802,563	$11,767,216	$163,917,765

*Decrease.

STATISTICAL DATA OF CHICAGO SURFACE LINES FOR THE FISCAL YEARS ENDED JAN. 31

	1923	1924	1925	1926	1927	1928
Rate of fare	8 cents 2-1-1922 to 6-14-1922; 7c-6¾ cents 6-15-1922 to 1-31-1923	7c-6¾ cents	7c-6¾ cents	7c-6¾ cents	7c-6¾ cents	7c-6¾ cents
Revenue passengers	762,629,211	824,850,103	830,151,540	842,201,453	876,249,663	882,458,647
Passenger receipts	$55,495,310	$56,986,687	$57,284,602	$58,076,487	$60,436,705	$60,892,995
Total earnings	56,103,061	57,655,169	58,081,678	58,785,880	61,173,601	61,624,752
Operating wages	27,163,996	27,458,736	29,246,390	29,012,641	29,812,518	30,280,959
Other operating expenses and taxes	17,252,072	17,381,016	17,328,569	17,615,564	18,058,971	17,950,536
Residue receipts	11,686,992	12,815,416	11,506,717	12,157,674	13,302,111	13,393,256
Less: Joint account expenses	620,000	885,000	450,000	130,297	363,934	657,038
	$11,066,992	$11,930,416	$11,056,717	$12,027,376	$12,938,176	$12,736,217
5 per cent on purchase price	8,039,343	8,076,569	8,127,158	8,169,099	8,173,948	8,190,354
55 per cent to city	1,665,206	2,119,615	1,611,257	2,122,052	2,620,325	2,500,224
45 per cent to companies	1,362,442	1,734,231	1,318,301	1,736,224	2,143,902	2,045,638

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Avenues. The Chicago Motor Coach Company is seeking to have the commission set aside this order.

Newspaper advertisements, frequent articles in the news columns and in trade papers and magazines, liberal use of car cards and public meetings at which talks have been made and motion pictures shown were the principal mediums of publicity.

The three motion pictures that were previously produced have proved so popular that it was decided to prepare another. "Safe Highways," a two-reel picture on the subject of safety, was completed the latter part of January. Through the speakers' bureau, consisting of employees of the company, 258 organizations with audiences totaling 59,800 were reached during the year. A route and sightseeing guide was distributed to 500,000 persons during the year and a new guide was issued Jan. 1.

Building Up a Sales Force

Every uniformed employee was impressed with the fact that his own interests were identical with those of his employers in securing and retaining the good will of his daily customers. More than usual care was exercised in the selection and training of new employees.

In conclusion President Henry A. Blair said:

> Notwithstanding the handicaps of expired franchises and operation under temporary municipal permits, the Chicago Surface Lines continued with all the vigor and enterprise of an efficient industrial organization, to give the people of this city the highest type of street car service. Although borrowing power was curtailed by the franchise situation, more track, new and rebuilt, was constructed by this system than by any other street railway in the country. Service was increased materially and a beginning was made in the establishment of feeder bus routes with buses of improved design.

Increase in Riding Significant

Perhaps the most significant fact, however, is the continued and consistent increase in riding. In a year when decrease in business was the rule in street railway operation, this system showed a substantial gain over the previous fiscal period. This has been true of every year for the past six years.

The Chicago Surface Lines alone of the street railways in the eight American cities with a population exceeding 700,000 had a greater number of revenue rides in 1927 than in 1923.

Undoubtedly so outstanding an example of successful operation is not a mere chance occurrence. It is due to the consistent policy of improvement in service, effective maintenance of property and the constant effort to encourage riding by fitting transportation to the needs of the community to as great a degree as legal and financial restrictions would permit.

It is to be hoped that these restrictions may be removed in the near future by the enactment of enabling legislation by the State and agreement between the city and the companies on a plan adequate for present and future needs of Chicago, including unification of the elevated and surface properties with subways and feeder bus lines organized under a terminable permit from the city affording the necessary basis for ample financing.

Hearing on Accounting for Railroads Adjourns

The hearing before Commissioner Eastman and Examiner Bunten of the Interstate Commerce Commission on a system of depreciation accounting for steam railroads proposed by the commission in docket No. 15,100, was temporarily adjourned on March 15 after a brief session, to March 19, when testimony on a proposed system of depreciation accounting for telephone companies was to be taken up.

It is expected that in the case of the electric railways similar consideration will be shown at the conclusion of the steam railroad inquiry.

Santa Barbara Property Offered to City

The Santa Barbara & Suburban Railway, Santa Barbara, Cal., a subsidiary of the Southern California Edison Company, is willing to give its property to the city of Santa Barbara, if the city is willing to take it according to F. B. Lewis, assistant general manager of the Edison company. He made this announcement during the course of a hearing before a State Railroad Commission examiner on the abandonment of a bus line on March 9. Earle Ovington, real-estate operator, had appeared to protest against the discontinuing of the bus service, on which excessive losses were claimed.

Mr. Lewis explained that the railway property could be turned over to the city subject only to the assumption by it of certain mortgage obligations now outstanding.

The system in Santa Barbara consists of about 9 miles of railway line and 5 of bus routes.

Indianapolis and Cincinnati Bond Case Complicated

Hearings were conducted recently in the Federal Court in Indianapolis, Ind., on the application of Fred H. Kelley, a stockholder of Mattoon, Ill., for appointment of a receiver for the Indianapolis & Cincinnati Car Trust Equipment Company, on the ground that no dividends or principal maturity payments had been made since November, 1926.

The trust equipment company was formed in 1923 to finance the construction of ten substations along the lines of the Indianapolis & Cincinnati Traction Company, now in receivership.

Proceeds of the bond sales were used to build the ten substations required when the railway adopted direct current and for the purchase of twelve new cars.

The case recalls recent action by bondholders' committees which approved the sale of the railway to Charles T. DeHore, Toledo, and others. The total par value of bonds which were acquired by the DeHore group was $2,600,000.

In buying the railway bonds, however, the DeHore group stood to come into possession only of the tracks, poles, right-of-way and station equipment, since all rolling stock, substations and

Conspectus of Indexes for March, 1928

Compiled for Publication in This Paper by

ALBERT S. RICHEY

Electric Railway Engineer, Worcester, Mass.

	Latest	Month Ago	Year Ago	Since War	
				High	Low
Street Railway Fares* 1913 = 4.84	March 1928 **7.61**	Feb. 1928 **7.59**	March 1927 **7.43**	March 1928 **7.61**	May 1923 **6.88**
Electric Railway Materials* 1913 = 100	March 1928 **140.1**	Feb. 1928 **139.5**	March 1927 **152.1**	Sept. 1920 **247.5**	Feb. 1928 **139.5**
Electric Railway Wages* 1913 = 100	March 1928 **228.8**	Feb. 1928 **228.7**	March 1927 **226.7**	Sept. 1920 **232**	March 1923 **206.8**
Am. Elec. Ry. Assn. Construction Cost (Elec. Ry.) 1913 = 100	March 1928 **200.5**	Feb. 1928 **200.9**	March 1927 **203.0**	July 1920 **256.4**	May 1922 **167.4**
Eng. News-Record Construction Cost (General) 1913 = 100	March 1928 **204.6**	Feb. 1928 **204.6**	March 1927 **208.8**	June 1920 **273.8**	March 1922 **162.0**
U. S. Bur. Lab. Stat. Wholesale Commodities† 1926 = 100	Feb. 1928 **96.4**	Jan. 1928 **96.3**	Feb. 1927 **95.9**		
Bradstreet Wholesale Commodities 1913 = 9.21	Mar. 1 1928 **13.34**	Feb. 1 1928 **13.53**	March 1 1927 **12.55**	Feb. 1 1920 **20.87**	June 1 1921 **10.62**
U. S. Bur. Lab. Stat. Retail Food 1913 = 100	Feb. 1928 **151.6**	Jan. 1928 **155.1**	Feb. 1927 **156.0**	July 1920 **219.2**	March 1922 **138.7**
Nat. Ind. Conf. Bd. Cost of Living 1914 = 100	Feb. 1928 **161.5**	Jan. 1928 **163.1**	Feb. 1927 **165.2**	July 1920 **204.5**	Aug. 1922 **154.5**
Steel Unfilled Orders (Million Tons) 1913 = 5.91	Feb. 29 1928 **4.398**	Jan. 31 1928 **4.276**	Feb. 28 1927 **3.597**	July 31 1920 **11.118**	May 31 1927 **3.051**
Bank Clearings Outside N. Y. City (Billions)	Feb. 1928 **16.99**	Jan. 1928 **19.73**	Feb. 1927 **16.72**	Oct. 1925 **20.47**	Feb. 1921 **10.43**
Business Failures Number	Feb. 1928 1885	Jan. 1928 2178	Feb. 1927 1855	Jan. 1924 2231	Aug. 1925 1353
Liabilities (Millions)	**50.62**	**54.03**	**66.34**	**122.95**	**27.22**

*The three index numbers marked with an asterisk are computed by Mr. Richey, as follows: Fares index is average street railway fare in all United States cities with a population of 50,000 or over except New York City, and weighted according to population. Street Railway Materials index is relative average price of materials (including fuel) used in street railway operation and maintenance, weighted according to average use of such materials. Wages index is relative average maximum hourly wage of motormen, conductors and operators on 136 of the largest street and interurban railways operated in the United States, weighted according to the number of such men employed on these roads.

†This index is changed to a base of "1926 = 100." That notation replaces the former basis of "1913 = 100." Inasmuch as the bureau has not calculated the index on this new base any further back than January, 1923, no figures are shown in this tabulation for the high and low points since the war. It is planned to compute the index on the new basis as far back as January, 1913. Until such time as the bureau makes public these figures for the earlier years this information will be lacking.

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copper wire were obtained on conditional sales contract by the railway from the trust equipment company.

Soon after the bond sale had been approved, Mr. DeHore and his associates started negotiations for control of the Indianapolis & Cincinnati Car Trust Equipment Company. They are said to have been successful in buying the $140,000 of Series B stock and 25 per cent of the $600,000 Series A, or only about $190,000 of the total of $740,000 stock outstanding. Recently it has been reported an organized group of stockholders of the Car Trust Equipment Company had resisted the offer made by the DeHore faction, and that in consequence a situation had been created which threatened practical dismantelment of the line of the Indianapolis & Cincinnati Traction Company.

Stockholders at Washington Approve Merger Idea

Stockholders of the Capital Traction Company, Washington, D. C., at a special meeting on March 15 ratified the transit merger agreement by a margin of approximately 8,000 votes. The day before the Washington Railway & Electric Company stockholders took similar action. Chairman Childress of the Public Utilities Commission declared he was going to do everything possible to bring about a merger now. He said:

We must strike while the iron is hot. Any postponements of the merger for an indefinite period perhaps would jeopardize efforts to bring about the long-desired unification of the transit lines, which would indicate that the commission has no intention of holding any public hearings.

Move in Foreclosure Proceedings Against Long Island Line

A further step to conserve the interests of bondholders of the New York & Long Island Traction Company, which ceased operation at midnight on April 5, 1926, was taken recently when judgment was entered in the Nassau county clerk's office in Hempstead for $1,163,449, in foreclosure proceedings by the Union Trust Company as trustee of the mortgage which guaranteed the bonds. The railway has been in receivership since Dec. 21, 1923.

Abandonment of Interurban Lines in Lincoln Sought

Abandonment of its trackage from 21st and Y Streets to the downtown business district terminal at Fourteenth and O Streets is planned by the Omaha, Lincoln & Beatrice Railway, Lincoln, Neb. The City Council and the State Railway Commission are being asked to approve the removal of the tracks and the stopping of service.

President Harvey Musser of Akron takes the position that the company cannot afford the assessment for paving that will be placed upon it by reason of the authorization of a new district which includes a considerable portion of its trackage. Considerable of its interurban traffic has been diverted to the railway company's buses.

Baltimore to Reclassify Unissued Stock—February Gross Gains

Stockholders of the United Railways & Electric Company, Baltimore, Md., at their annual meeting to be held on April 11, will be asked to approve of an amendment to the charter of the company to empower the board of directors to classify or reclassify any unissued stock of the company in the form of preferred stocks, and to issue and sell convertible securities. The initial step in this direction was taken by the board at its monthly meeting on March 20, a resolution recommending such action having been adopted. President C. D. Emmons said:

The company, in order to avoid the annoyance and expense of a special meeting, has included in the notice for the annual meeting a resolution giving power to the company, through its directors, to file an amendment to the company's charter authorizing the issue and sale, subject to the approval of the Public Service Commission of Maryland, of any part of the present authorized but unissued common stock in the form of preferred stocks, and to issue and sell convertible securities.

This authorization has no immediate significance from the standpoint of financing the company, as the company's position does not at present justify the use of such securities, but it was thought well to give the company the power, through its directors, to take either or both of these steps, if later they seem to be advantageous.

The total amount of the authorized capital stock of the c mpany is $35,000,000 par value, div. led into 700,000 shares of the par value of $50 each, all of which are common stock. Of the authorized stock 409,224 shares are outstanding.

Earnings from Jan. 1 to Feb. 29 (60 days), 1928, compared with 1927 (59 days), were as follows:

	1928	Increase
Passenger rev.	$2,617,513	x$22,670
Other revenue	33,595	x2,211
Totals	$2,651,108	x$24,882
Oper. expenses	$1,676,907	$46,600
Depreciation	132,555	x1,244
Totals	$1,809,462	$45,355
Net oper. rev.	$841,645	x$70,238
Taxes	258,237	x14,313
Oper. income	$583,408	x$55,924
Non-op. income	21,933	398
Gross income	$605,342	x$55,526
Fixed charges	474,872	7,055
Remainder	$130,470	x$62,582
Interest on income bonds	93,333	.....
Net income	$ 37,136	x$62,582

xDecrease.

Net income by months was:

	1928	1927	Increase
January	$18,366	$72,128	x$53,761
February	18,769	27,590	x8,820
	$37,136	$99,718	x$62,582

xDecrease.

Fares were changed at midnight, Feb. 12, 1928, from 8-7½ cents for adults and 4 cents for children to 9-8⅓ cents for adults and 5 cents for children. There was no change in commutation or school ticket rates. For the month of February revenues and expenses are for 29 days in 1928, as compared with 28 days in 1927. Expenses for 1928 are at increased wage over 1927—2 per cent effective Jan. 1 and additional 2 per cent effective Feb. 12.

Protest Voiced Against California Tax System

Before an open forum meeting held recently by the California Tax Commission, attorneys for the electric railways in southern California protested against the present system of state taxation. The present state tax was declared to be a serious burden which increases yearly. It was declared that no electric railway in California is making an equitable return on its investment.

A substantial reduction in the present gross receipts tax of 5½ per cent was advocated by W. D. Hill, representing the Electric Railways Association. He suggested that relief should come from stringent paving requirements imposed on the railways, and expressed the belief that municipally owned public utilities should be taxed in proportion to assessments levied on privately owned utilities. In his opinion no state electric railway was making in excess of 5 per cent of its investment and most of them were making only 1 per cent.

Council Approves Increase in Philadelphia Capital

Increase of the capital stock of the Philadelphia Rapid Transit Company, Philadelphia, Pa., from $60,000,000 to $65,000,000 has been approved by the transportation committee of the City Council.

Of the $5,000,000 increase, $1,500,000 will be used for relocating the Market Street subway-elevated tracks under City Hall and for necessary changes in the underground stations. Another $1,500,000 is to be used in the construction of a garage for 500 motor cars, company buses and taxicabs beside the Fern Rock terminal yards of the Broad Street subway. The balance of $2,000,000 will be used in acquiring real estate for another garage in Locust Street, on the site of the old Hollingsworth school, at the rear of the Academy of Music.

In reply to a question about provision in the ordinance that any of the money not spent on the projects named could be used for other capital purposes Coleman J. Joyce, counsel for the company said:

That is right, but we do not expect to change the purposes enumerated in this ordinance. These figures are estimated, and sometimes such figures are under or over final costs. In case there is an underestimate, we must have a free hand to meet the costs out of the capital.

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Personal Items

A. A. Mitten Succeeds T. E. Mitten as Chairman

At the annual meeting of the stockholders of the Philadelphia Rapid Transit Company, held on March 21, the following directors were elected to serve for a period of one year: A. A. Mitten, W. K. Myers, J. A. Queeney, R. T. Senter, R. F. Tyson, L. W. Hackett, J. McCartney and J. C. Haungs.

Mayor Harry A. Mackey, by virtue of his office, also serves as a director. E. T. Trigg and J. S. McCullogh are the other directors representing the city under the 1907 city-company agreement. T. E. Mitten resigned as chairman of the board so that the employees might have three representatives instead of two.

The employee representatives on the board are L. W. Hackett and J. McCartney, president and vice-president of the Employees' Co-operative Association, and J. C. Haungs, chairman of the general committee for employees under the Mitten plan. Mr. Hackett is a general repairman in the rolling stock and building department, Mr. McCartney is a driver in the bus department and Mr. Haungs is a paper cutter in the printing department. The board of directors thus consists of five men who are directly concerned in the management of the property, three who are representatives of the employees and three who represent the city.

The meeting of the new board of directors was held directly following the stockholders' meeting. A. A. Mitten was elected chairman of the board of directors and W. K. Myers vice-chairman. Mr. Myers becomes chairman of the executive committee, the membership of which also includes A. A. Mitten, J. A. Queeney and R. T. Senter.

The board of directors elected the following officers of P.R.T.: President, R. T. Senter; general counsel, E. A. Ballard; vice-president, R. F. Tyson; comptroller, W. M. Campbell; secretary of board, A. N. Hinkel; auditor, R. C. Williams; treasurer, G. W. Davis; secretary, F. B. Ellis.

G. D. Rushing Promoted at Shreveport

G. D. Rushing, formerly master mechanic of the Shreveport Railways, Shreveport, La., has been promoted to the post of superintendent of power and equipment. Mr. Rushing entered the service of the company in 1903, when it was known as the Shreveport Traction Company, as a motorman and conductor. He continued in this work for about a year and a half, meanwhile directing his energies to work in the shop. He acquired a good deal of practical experience and as a result was made master mechanic in 1907. This position he held until he was made superintendent of power and equipment.

Mr. Rushing was born in 1878 in Wood County, Tex. He lived on a farm until he was sixteen years of age when he became a clerk in a store. Here he remained for two years. Then he returned to school for a few years.

R. F. Palmblade President of Illinois Association

R. F. Palmblade was elected president of the Illinois Electric Railway Association at the convention held in Springfield, Ill., March 14-15. The new president entered the utility business in 1910 as foreman in the construction department of the Illinois Traction System. From the latter part of that year until 1912 he served as draftsman in the engineering department. During the next four years his headquarters were in Peoria, as operating engineer with the Peoria Railway. From this work he went to Jefferson City, Mo., serving in the capacity of general superintendent of the Jefferson City Light, Heat & Power Company and the Jefferson City Bridge & Transit Company. This work covered a period of three years from 1917 to 1920. Then he returned to the Peoria property taking on the duties of general superintendent until 1924. Since that time he has been manager of the Peoria Division of the Illinois Power & Light Corporation.

R. F. Palmblade

M. O. BENEDICT has succeeded G. D. Rushing with the title of active master mechanic of the Shreveport Railways, Shreveport, La. He began his career in the electric railway industry in 1906 and located in Shreveport in 1920, becoming chief electrician for the Shreveport Railways. This position he has held until his recent appointment. Mr. Benedict was born in New Madrid County, Mo., in 1889. He was educated in the public schools.

Messrs. Cooke, Bosserman and Ross Promoted in Pittsburgh

M. W. Cooke has succeeded A. J. Fink as superintendent of traffic and schedules of the Pittsburgh Railways, Pittsburgh, Pa. As was mentioned in the ELECTRIC RAILWAY JOURNAL, issue of March 10, Mr. Fink is now transportation engineer of the St. Louis Public Service Company, St. Louis, Mo.

Mr. Cooke entered the employ of the Philadelphia Company (the holding company of the Pittsburgh Railways) in 1911 as superintendent of the telephone department. In July, 1924, he was made superintendent of the overhead lines department of the railways, and in December of the same year was appointed chief of the current control department. He remained in this capacity until September, 1926, when he assumed charge of power and inclines. He was serving as superintendent of power and inclines at the time of his recent appointment.

Mr. Cooke was educated at Baltimore City College and John Hopkins University.

Assisting him in his new work is Traffic Engineer P. R. Bosserman, who has been associated with Mr. Cooke since 1925. Mr. Bosserman started with the railway company in 1915 in the substation department, but in 1925 was appointed by Mr. Cooke supervisor of maintenance and construction in the overhead lines department. In 1927 he was promoted to the office of superintendent of substations and inclines. This latter position he held until his recent appointment as traffic engineer.

The vacancy caused by the resignation of Mr. Cooke as superintendent of power and inclines has been filled by John L. Ross, until recently, engineer of power and inclines. Mr. Ross, a graduate of Carnegie Tech in electrical engineering, has been with the Pittsburgh Railways since 1917, when he entered the services of the company in the load dispatcher's office. He was later made chief load dispatcher, and then inspecting engineer of the technical division until his appointment as power and incline engineer in 1926.

H. M. Gould Editorial Consultant

Harold M. Gould, formerly electrical engineer and assistant general manager of the Department of Street Railways at Detroit, Mich., and previously student engineer in all departments of the metropolitan street railways in New York, has been added to the staff of *Nation's Traffic* as engineer adviser. The magazine, published monthly in St. Louis, is devoted to solving street and highway traffic problems.

Mr. Gould was graduated from the Sheffield Scientific School, Yale University, in 1907. Subsequently he served two years in the electrical department of the Long Island Railroad, and later joined the Metropolitan Street Railway in New York. He was with the city engineering department of

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Bridgeport for eight years following, and thence went to New Haven to join the electrical department of the Connecticut Company. He left this company to become electrical engineer and assistant general manager of the Department of Street Railways in Detroit.

For the last two years Mr. Gould has been transportation engineer with Dodge Brothers, Inc., meanwhile acting as consulting engineer with the Detroit Police Department. In this capacity he recently completed a comprehensive survey of traffic in Detroit in which he recommended measures to be taken to remedy that city's traffic ills.

OSCAR A. BENNETT has assumed the position of assistant comptroller of the Puget Sound Power & Light Company, Seattle, Wash. Mr. Bennett for the past four years has been assistant treasurer of the Blackstone Valley Gas & Electric Company. John W. Kelly has succeeded him. Mr. Kelly had been assistant treasurer of the Baton Rouge Electric Company, Baton Rouge, La.

H. V. Wenger on Indiana Commission

Earl L. Carter has resigned as chief engineer of the Indiana Public Service Commission effective on April 1, to enter private consulting work. In his position as engineer for the commission, one of his principal duties was to fix valuations of utilities for rate-making purposes. He entered the service of the commission in 1917 as assistant engineer and succeeded Harry O. Garman as chief six years ago. He was graduated from Purdue University in 1914.

Harry V. Wenger, former member of the engineering staff of the commission, has been selected as Mr. Carter's successor. Mr. Wenger took a position with the commission in 1917. He served on the commission engineering staff more than three years. He left in 1923 after having been elected chief engineer of the Railroad Commission of South Dakota. Later he returned to Indianapolis and has been in private engineering work since that time.

The Story of Sam Greenland

Another railway official regarded as good diet for popular consumption is Sam Greenland, who was featured in the Sunday, Jan. 22, issue of the St. Louis *Globe Democrat*. All JOURNAL readers know by this time the work-loving, 48-year old general manager of the St. Louis Public Service Company, and residents of his city look to him to supply them with the best car service. The writer of this article says that long before he became an expert in the operation of electric railways he was a tool dresser in the oil fields, a lumberman, a clerk by day, a bill collector at night and a telephone lineman. How he happened into the railway business and what he made of it are now history, recorded from time to time in these pages.

Thomas H. David

Messrs. David and Tretton Advanced in Indianapolis

Promotion of two veteran employees of the Indianapolis Street Railway, Indianapolis, Ind., was announced recently by Robert I. Todd, president. They are Thomas H. David and James P. Tretton.

Mr. David, principal assistant engineer, has been promoted to chief engineer. He succeeds T. B. McMath, who has retired from active service because of ill health but retains the position of consulting engineer. Mr. David has had a long career in railroad work. After he was graduated from Purdue University in 1901, he spent the next six years on steam railroads in bridge, maintenance and construction work, being identified with some of the early elevation work in Indianapolis. In 1905 he received the advanced degree of civil engineer from Purdue University. Since 1907 he has been assistant and principal assistant engineer.

During the construction of the joint interurban terminal freight houses in Indianapolis in 1923 Mr. David was supervising engineer. These are believed to be the largest interurban freight facilities of their kind in the world, costing approximately $900,000. The houses have 43,160 sq.ft. of floor space under cover and 3 miles of tracks on the property which cover an area of approximately 12 acres.

Mr. David was born in Indianapolis Aug. 18, 1876. He is a member of the American Society of Civil Engineers.

The appointment of James P. Tretton, superintendent, to the position of general superintendent, comes as a well-merited acknowledgment of his 30 years continuous employment in the various departments of the Indianapolis Street Railway. He entered the company's service in 1898. It may be said that the electric railway business was Mr. Tretton's "first love" as he began his career after leaving school, at the age of fifteen years, his first position being in the truck department of the company's shops. Later he was promoted to the storeroom at the shop. In 1904 he was appointed paymaster. Three years later he was placed in charge of arranging schedules for the operation of the different lines. In 1907 he was advanced to the position of assistant superintendent and in 1919 he was made superintendent. On Jan. 1, 1928, he was advanced to the post of general superintendent.

James P. Tretton

J. A. BROMLEY, general manager and engineer of York Corporation Tramways, York, England, has been appointed general manager of Durban Corporation Tramways, South Africa. Before going to York Mr. Bromley held prominent tramway positions at Leeds and afterwards at Keighley.

Obituary

CHARLES P. HOWARD, president of James L. Howard & Company, Inc., Hartford, Conn., manufacturers of railway car supplies, died March 6 at his home in that city. Mr. Howard was educated in the Hartford schools and later matriculated at the Massachusetts Institute of Technology. After graduation as a mechanical engineer he became associated with the Howard company where he spent his business life. He was 74 years old.

DARLING L. WILSON, an employee of the Dallas traction lines for the past 41 years, and the Dallas Railway & Terminal Company since its organization, died recently in that city. Mr. Wilson was the author of a history in which he traced the development of railway traffic in Dallas from the days of the first mule car up to the present time.

W. N. OLDHAM, the oldest trainman in the employ of the Portland Electric Power Company, Portland, Ore., died Feb. 15, after 40 years of service. He was operator of the first horse car on the east side, and when cars were electrified he was placed on the Woodstock line. Since that time he had worked on various lines, with no major accident while in service. Mr. Oldham was 77 years old and worked up to June of last year.

STANLEY SHAFFER, 67 years old, prominent member of the Cincinnati Bar, died recently. He was associated with the builders of the Cincinnati, Lawrenceburg & Aurora Electric Street Railroad from its inception, a connection which continued until his death.

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Manufactures *and the* Markets

How Price Cutting Works

A Close-Up Picture of the Tension that Exists Between the Seller and the Purchaser in the Utility Industries

By Earl Whitehorne
Commercial Editor "Electrical World"

In the Feb. 18 issue of Electric Railway Journal Mr. Whitehorne outlined *the evils that result from the present "buyer's market" for utility equipment. In this article he cites some of the purchasing and selling practices that are not in accord with sound business principles.*—Editor.

IT IS perfectly natural and practical and proper for the purchasing agent to buy as cheaply as he can. And it is no less right for the manufacturer who sells the goods to get as profitable a price as possible. But in the evolution of business certain principles have developed and certain responsibilities. The trickery that once was the life and sparkle of horse trading, is now frowned upon. Fair dealing has become the accepted standard in commerce. The seller is supposed to give honest value and the buyer is expected to pay an honest price. Why, then, is there so much talk right now of trouble between large buyers and sellers? What has gone wrong in the market place that there is bitter talk of price cutting by manufacturers and profiteering by purchasers?

Tricks of the Purchaser

Study it a bit and you find an interesting thing. There are some manufacturers who have the courage to establish prices and maintain them. Their price is their price and they refuse to dicker. But there are some who lack the courage or the strength. And just so there are some purchasing agents who do not haggle. They ask for bids from suppliers whose product is acceptable and the low man gets the business. But their are others who seem to consider their function one of dollar squeezing; and the length to which this gentle art is carried is astonishing.

The number and variety of tactics employed by these purchasers are without end, but there stand out certain typical situations:

1. Where the purchasing agent gets the high bidder to cut on the indefinite promise of a large block of business next year.

2. Where the buyer lies, giving a bidder the false intimation as to his competitor's price, or representing the competing price on motors alone, for instance, as the complete price for motors and control or citing a price on equipment that is not comparable, or ringing some other subtle change on the truth that deceives and tempts the bidder to cut.

3. Where the large buyer demands special discounts for large volume, claiming that this volume carries the manufacturer's overhead, and thus forces the big manufacturers' price down to where the small manufacturer cannot compete.

4. Where very large buyers of electrical equipment that is used as part of a manufactured product threaten to make their own equipment unless the price is cut.

5. Where large utility holding companies argue that one of the savings possible through holding company operation should show up as savings in purchasings, and demand discounts greater than those given to operating companies, which eliminate the small manufacturer and force the large manufacturer's price below the margin that provides for the further development of bigger and better apparatus.

6. Where purchasing agents apparently do not know how to buy because they have no facts to check bids with and no methods of evaluating bids and therefore resort to haggling.

What the Seller Does

That's what they are saying about the purchasing agent—not all, of course—but many. But what is the matter with the manufacturer? you'll say. Why does he fall for such methods? There is the rub. The manufacturer right now finds himself in a buyer's market. He has permitted himself to become involved in a mad scramble for orders that has enmeshed him until for every story reflecting upon the purchasing agent there are fourteen about manufacturer and his salesmen. As one man put it—"You can take a pure young man and make him a purchasing agent today and before Sunday the manufacturer's salesmen will have taught him all the dirty tricks in the business."

The utility purchasing agents say that the manufacturers are themselves the greatest culprits and are responsible for price buying. They say that first bids today are made for trading purposes only. Therefore, they say, they too must use trading methods because those are the methods that the manufacturers have developed and seem to understand. The purchasing agents say that they are willing to pay fair prices but that the manufacturers haven't the courage to put fair prices on their products and then stick to them.

The small manufacturer also charges that although the large manufacturers state that they desire competition and see no virtue in monopoly, yet they chafe under the competition of the small manufacturer and cut prices to get business, relying on price cutting and not on better quality, better delivery or better salesmanship to maintain their position. It is alleged that the spread of prices established by these larger manufacturers is unreasonably wide and is not justified by the savings effected in making and selling the larger quantity to the large buyer. In this competition between the manufacturers also, certain typical conditions stand out—

Tricks of the Manufacturer

1. The large manufacturer uses the lump sum bid as a lever to lower prices on individual products to compete with the small producer who specializes in that line. It is said that at times this is so manipulated that it has the effect of a straight price cut.

2. Allowances are made on old equipment taken back that range all the way from a reasonable scrap allowance to the full original price. This is pure price cutting when the allowance is more than the seller may reasonably expect to realize from the second-hand value.

3. Some manufacturers are making extravagant contributions in preliminary engineering expense for detailed working data that is out of all reason and constitutes a price consideration because it puts an undue extra burden on the profit.

4. Financial affiliations between some manufacturers and the utility companies are used to bringing pressure from on high to throw the order.

5. Reciprocity arrangements are drawn into competitive bids to an extent that overshadows the actual comparative values involved and works an injustice upon bidders who are invited to compete with the assumption that it is to be a fair and open contest.

6. And then there are the everyday conditions of price cutting where the manufacturer loses his nerve and pares his price for no other purpose than to get the order and camouflages it with all manner of alibis and explanations, such as a mistake in figuring, or new information or an unpectedly favorably purchase of materials or some other cock-and-bull story.

The Moral Aspect

There are many time-honored practices that some day will give way to the onward march of principle and be changed. There are many things that men used to do that have been stopped and are not countenanced today. After all, it gets down to a very simple consideration of plain honesty. If a purchasing agent lies or otherwise deceives a bidder into cutting his price, he is not dealing honestly. He is not fair. And if a manufacturer offers a bid that is not fair, either because the goods are not worth the money, or because he has padded the price for trading purposes, he is not dealing honestly.

Everybody will agree that it is considered wrong to slip your hand into a man's coat pocket and extract his wallet while his attention is distracted. No purchasing agent will do this to a salesman. No manufacturer will do it to a buyer. Well, the only difference is that dickering with bids and cutting prices has not yet lost its social standing. Today it involves no conspicuous degree of moral turpitude. But gradually the day will come when between intelligent business men price cutting will be taboo.

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It is a matter of simple inescapable truth that destructive commercial warfare between competitors or between buyers and sellers eventually demoralizes markets, wrecks the economic health of the industry, and ultimately paralyzes the service upon which the public is dependent. And that is the reason why we find modern business bulwarked about with codes and standards and principles, with a highly developed system of self imposed controls that have evolved out of experience because without co-operation and mutual good will there is no safety for investment, no stability upon which to base projects and plans.

TWO OBJECTIVES

The greatest single problem in this whole situation to my mind is the difficulty of shaking men loose from the purely negative idea that because these unintelligent buying practices are general and have existed for long, they can't be changed. But that is just foolishness. Every buyer wants to get his money's worth. Every seller wants to get a fair price. No more, no less is satisfactory. What can be done, therefore, to put an end to the haggling and the price cutting? Fundamentally it seems to me there are two things to be done:

One — By the purchaser — Industry needs more intelligent buying. It needs purchasing agents who know the values of the equipment they buy, and make of their function something more than an adroit matching of prices. It needs recognition that what is bought must be paid for and that bids which embrace elements of engineering, and of service as well as the delivered product, cannot be compared by a mere tallying of the total cost figures.

And Two—By the manufacturer— Industry needs more sincerity in selling. It needs manufacturers who consider that a bid is a word given—an honest offer of service to a friend—and not just a gesture in a sparring match. In other words, a bid from a responsible concern to a reputable customer should be a firm bid, the pledge of the house, signed with its good name. And such a bid is the equivalent of an open bid because there is no trick in it. It is not subject to a revision, any more than the written word of that manufacturer is subject to question, because his honor is involved.

All this will not happen at once—not this week. I know it. But industry can work toward it—can fight for it. And the logical approach to it is for the seller to refuse longer to cut his price because the buyer tells him to. Let him at least begin to protect himself by making sure that the other bids that he is asked to beat are comparable and that the purchasing agent is not lying. If he is asked to refigure after the bids are in let him at least demand that all the bids be opened to inspection. And also, it is time the manufacturer knew a little more about the reasons why he loses orders, through regularly organized post mortem studies of the bids on his closed business.

Wheeler and Childress Railway Planned

Construction of an electric interurban railway between Wheeler and Childress, Tex., approximately 80 miles, is planned by the group of large oil companies which are operating in the Panhandle District. Electric power for the proposed line will be furnished by the West Texas Utilities Company which already has a power transmission line along the entire route of the proposed railway. Although it is intended that the electric railway shall handle passenger traffic, its chief purpose will be to give the oil fields of these companies an additional transportation outlet. The road will pass through Shamrock, Wellington and serve other smaller towns.

First of Twelve New Macon Cars Shipped

The first of the twelve new units for the Macon Light & Railway Company built by the Perley A. Thomas Car Company were shipped on Feb. 22. The second one was scheduled for shipment the last of that week. Delivery of the remainder is at the rate of two cars per week until completion of the order.

The cars are of the one-man double-end double-truck type, all steel design. They have an over-all length of 41 ft. 8 in. and a seating capacity for 40 passengers. Green and cream is the color scheme of the exterior, and the interior trim is of cherry. Specifications were printed in ELECTRIC RAILWAY JOURNAL issue of Oct 15.

Madagascar to Electrify

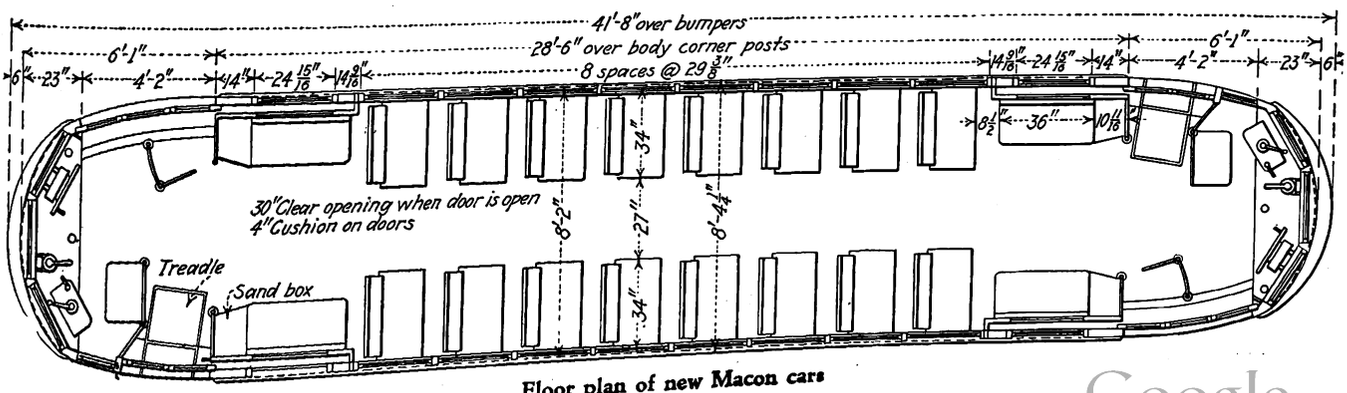
The government of the French colony of Madagascar has approved a project for the partial electrification of the Tananarive-East Coast main line railway to make use of the potent waterfalls located on the Mangoro River. The project is estimated to cost 20,000,000 francs, not including electric locomotives. It will take six years to complete. The work will probably not be undertaken before late in 1928.

Employment Activity on Increase

Employment and activity in the manufacturing industries of the United States have been on the increase since November, 1927, it is indicated by the January, 1928, returns from about 2,000 manufacturing plants reporting monthly to the National Industrial Conference Board, New York. These plants are located throughout the various sections of the country, are of both large and small size and represent 25 different divisions of manufacturing. Inasmuch as midwinter is a quiet period in many industries, seasonal influences should show further improvement in February and March employment when the data for these months become available, in the view of the board.

January figures show more than 1 per cent increase over the number employed last November which, according to the conference board's reports, was the lowest ebb of employment for the year 1927 and the lowest since the last quarter in 1924. However, not only has the number of employed increased, but the total number of hours worked in these plants shows an even greater increase, totalling 3½ per cent more than in November, 1927. This, the conference board points out, indicates not only more employees at work but an increased number of working hours per employee, and thus an increase in activity exceeding that indicated by the additional number of men engaged. Average weekly earnings per worker during January showed proportionate increase.

The decline in employment in the manufacturing industry during the year 1927, which came to a halt in December, amounted to only 3½ per cent for the entire year from January, 1927, to January, 1928. There was a decrease in manufacturing employment in



Floor plan of new Macon cars

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January, 1928, as compared with January, 1926, when industrial activity was near the peak of the 1921-1927 period. The total number of hours worked, in January, 1928, was 8½ per cent lower than in January, 1926, and 4 per cent lower than in January, 1927.

Steel for Subway Work

Bids will be taken March 30 on 7,700 tons of structural steel for a subway section near Prospect Park, Brooklyn. The state of North Carolina is in the market for 3,000 tons for state highway bridges near Wilmington.

American Bridge Company has taken 500 tons of bridge work for New York State, and an inquiry is in the market for 500 tons additional. Erie Railroad is inquiring for 250 tons for a pier on the Hudson River in Jersey City.

ROLLING STOCK

WINNIPEG ELECTRIC COMPANY, Winnipeg, Canada, has received recently three Twin Coaches of the mechanical-drive, street car type, made by Twin Coach Corporation.

SAN DIEGO ELECTRIC RAILWAY, San Diego, Calif., has received its third street car type Twin Coach made by Twin Coach Corporation, Kent, Ohio.

HAZLETON AUTOBUS COMPANY, Hazleton, Pa., a subsidiary of the Lehigh Traction Company, has received from Mack Trucks, Inc., New York, N. Y., one Mack six-cylinder 29-passenger city-type bus.

WICHITA FALLS TRACTION COMPANY, Wichita Falls, Tex., operating the Wichita Falls Bus Company, has placed in service two Mack four-cylinder 25-passenger city-type buses.

MONTREAL TRAMWAYS, Montreal, Canada, has ordered 50 new cars costing about $1,000,000, from the Canadian Car & Foundry Company.

ILLINOIS POWER & LIGHT CORPORATION, Chicago, Ill., has accepted delivery on one Mack six-cylinder 29-passenger parlor-car bus.

CHICAGO, SOUTH SHORE & SOUTH BEND RAILROAD, Michigan City, Ind., has received two 80-ton electric locomotives built by the Baldwin Locomotive works and the Westinghouse Electric & Manufacturing Company. The new engines, of 1,200 hp., are 39 ft. 4 in. long, and cost about $56,000 each.

CITY OF OSLO, Norway, has placed an order for four more A.C.F. 198 in. wheelbase chassis. The fleet at Oslo now consists of 43 A.C.F. buses.

SHOPS AND BUILDINGS

CINCINNATI STREET RAILWAY, Cincinnati, Ohio, has put into service the Colerain Avenue substation, first of the nineteen stations to be completed in the new automatic power distribution system now under construction. Power from this station will go to cars on five routes. All five stations are scheduled to go into service in July.

BRITISH COLUMBIA ELECTRIC RAILWAY, Vancouver, B. C., is reported to be planning to erect two substations at an estimated cost of $70,000.

METAL, COAL AND MATERIAL PRICES

F. O. B. REFINERY

	March 20, 1928
Metals—New York	
Copper, electrolytic, cents per lb.	13.8125
Copper wire, cents per lb.	16.125
Lead, cents per lb.	6.00
Zinc, cents per lb.	6.00
Tin, Straits, cents per lb.	52.25
Bituminous Coal, f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	.....
Somerset mine run, Boston, net tons	.....
Pittsburgh mine run, Pittsburgh, net tons.	.....
Franklin, Ill., screenings, Chicago, net tons	1.825
Central, Ill., screenings, Chicago, net tons	1.675
Kansas screenings, Kansas City, net tons.	2.125
Materials	
Rubber-covered wire, N. Y., No. 14, per 1,000 ft.	5.30
Weatherproof wire base, N. Y., cents per lb.	16.50
Cement, Chicago net prices, without bags.	2.05
Linseed oil (5-bbl. lots), N.Y., cents per lb.	10.3
White lead in oil (100-lb. keg), N. Y., cents per lb.	13.25
Turpentine (bbl. lots), N. Y., per gal.	$0.655

TRACK AND LINE

LOS ANGELES RAILWAY, Los Angeles, Cal., has under way a widening and grading program on Vermont Avenue between San Marino and Washington Streets. Grading will also be done on Mesa Drive from Vernon to 61st Street.

KANSAS CITY PUBLIC SERVICE COMPANY, Kansas City, Mo., has submitted its 1928 program for track improvement to the Kansas City park board and the director of public works. The program includes the reconstruction of the double tracks on Broadway between West Linwood Boulevard and Westport Road, the relaying of the double tracks on Prospect Avenue between 43rd and 47th Streets and a single track on Prospect Avenue between 48th and 75th Streets. Other double tracks to be relaid are on Twelfth Street between McGee Street and Euclid Avenue, Main Street between Pershing Road and 27th Street, McGee Street from Twelfth to Fifteenth Streets, Walnut Street between Twelfth and Thirteenth Streets and Jackson Avenue between Twelfth and Fifteenth Streets.

TRADE NOTES

E. D. GIBBS, who has served as advertising director of The National Cash Register Company, Dayton, Ohio, at three different periods, has resigned his position to engage in business for himself in New York City. He will serve a limited number of clients on work in connection with sales promotion, sales contests and advertising. His temporary New York address after March 15 will be 66 West 55th Street.

IDEAL COMMUTATOR DRESSER COMPANY, Sycamore, Ill., has opened a New England office at 182 Purchase Street, Boston, Mass., and has appointed the following new sales representatives: C. B. Keck, 1565 Ryalmount Road, Cleveland Heights, Ohio; F. D. Lawrence Electric Company, Cincinnati, Ohio; O. T. Hall, 432 North Calvert Street, Baltimore, Md.; G. A. Brewer, New Haven, Conn.; and DeMoss-Fox & Company, Detroit, Mich.

ARMCO CULVERT MANUFACTURERS ASSOCIATION, Middletown, Ohio, has appointed as its municipal engineer Harry E. Cotton, formerly assistant city engineer at Omaha, Neb. His engineering experience is now at the service of all municipalities in the United States and Canada for assistance in the solution of problems involving drainage, subdrainage and flood control.

HENDRICK MANUFACTURING COMPANY, Carbondale, Pa., manufacturer of "Mitco" interlocked steel grating, stair treads and armorgrids, announces the opening of a Chicago district office, 223 Railway Exchange Building, Chicago, in charge of Lon Sloan.

GERARD SWOPE, president of the General Electric Company, has returned to this country after a trip abroad. He says England is definitely on the road to economic and industrial recovery and progress is everywhere evident.

ASBESTOS BRAKE LINING ASSOCIATION and the National Battery Manufacturers Association announce the removal of their offices to the Hale Building, 7 East 44 Street, New York, N. Y.

ADVERTISING LITERATURE

SILENT HOIST, WINCH & CRANE COMPANY, Brooklyn, N. Y., has issued a new bulletin, No. 27, on winches. The winches illustrated are suitable for either portable or stationary use and as car pullers.

SHERMAN CORPORATION, Boston, Mass., has published a report of a survey of industry, entitled, "What Is Happening to Business?" The report includes causes to which increase or decrease in net profits is attributed, and excerpts from interviews with representative business executives.

LINCOLN ELECTRIC COMPANY, Cleveland, Ohio, has issued a new bulletin descriptive of the "Linc-Weld" motor.

GENERAL ELECTRIC COMPANY, Schenectady, N. Y., has issued bulletin GE A-828 describing the electrification of the Butte, Anaconda & Pacific Railway. Other bulletins issued are: GE A-872 on drum-type controllers for railway service; GE A-951 on Mazda C short-circuiting lamp and socket; GE A-137A on synchronous motors, types T.S. & Q.S.; GE A-914 on CR9441-LS 424A limit switch; GE A-797 on the repair of railway commutators; GE A-921 on better lubrication of railway motors; GE A-467A on automatic starters for slip ring motors; and GE A-808A on totally enclosed fan-cooled motors.

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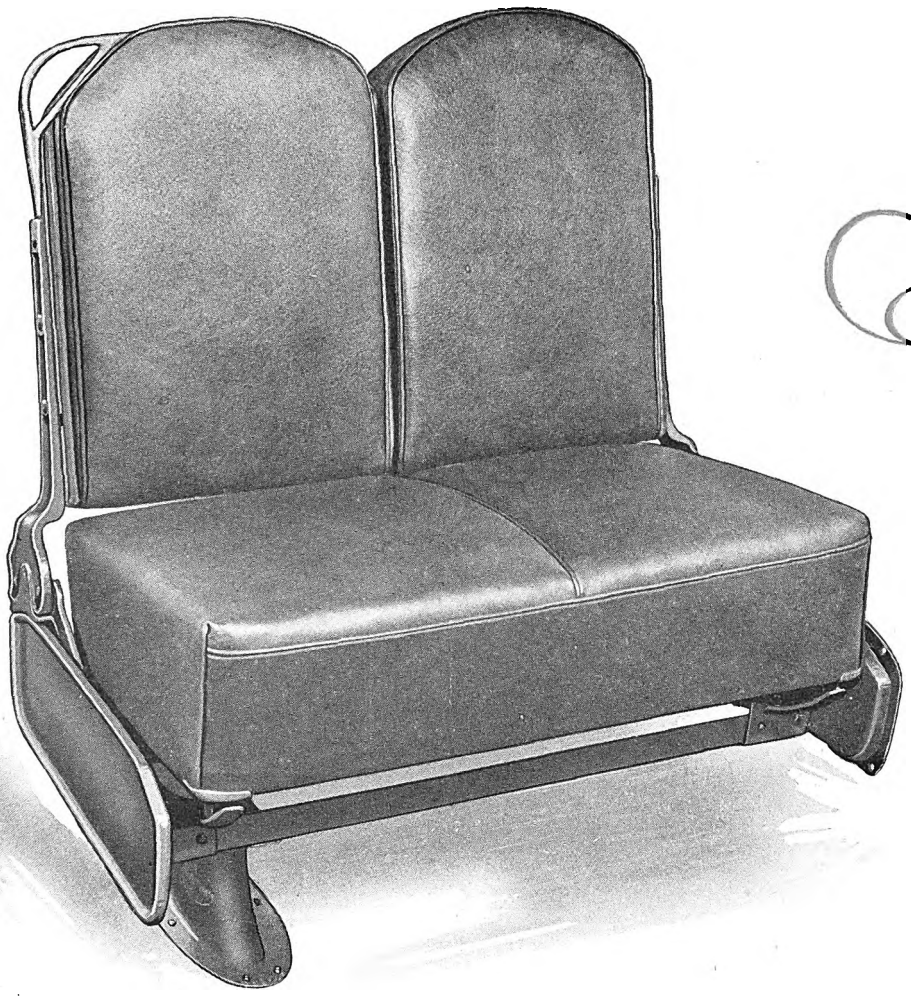

Brill Seating Comfort—
An Aid to Successful Service

From a business building standpoint, the satisfaction of a passenger is as important as his safety. He must ride comfortably. In this connection, the seating equipment is one of the most important considerations.

The leather upholstered, deep spring construction of the Brill 201-B-1 Seat, for example, unquestionably attracts passengers and creates more friendliness in public relations. It is one of the most popular types in the wide range of Brill Seats and was the selection for the Brill 1928 Model Car.

Back of every Brill Seat are the many years of car building experience which give Brill Engineers a keen understanding of other problems such as windows, lights, heating and piping in connection with seat installations.

For the utmost in seat satisfaction, specify Brill Seats.

THE J. G. BRILL COMPANY
PHILADELPHIA, PA.

AMERICAN CAR CO. ST. LOUIS MO. — G.C. KUHLMAN CAR CO. CLEVELAND, OHIO. — WASON MANF'G CO. SPRINGFIELD, MASS.

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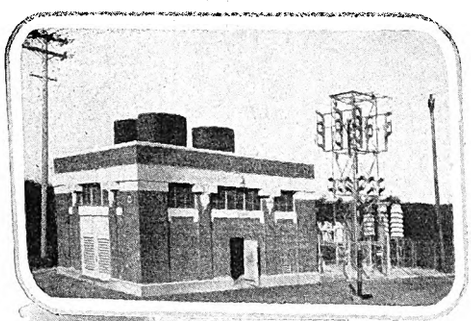
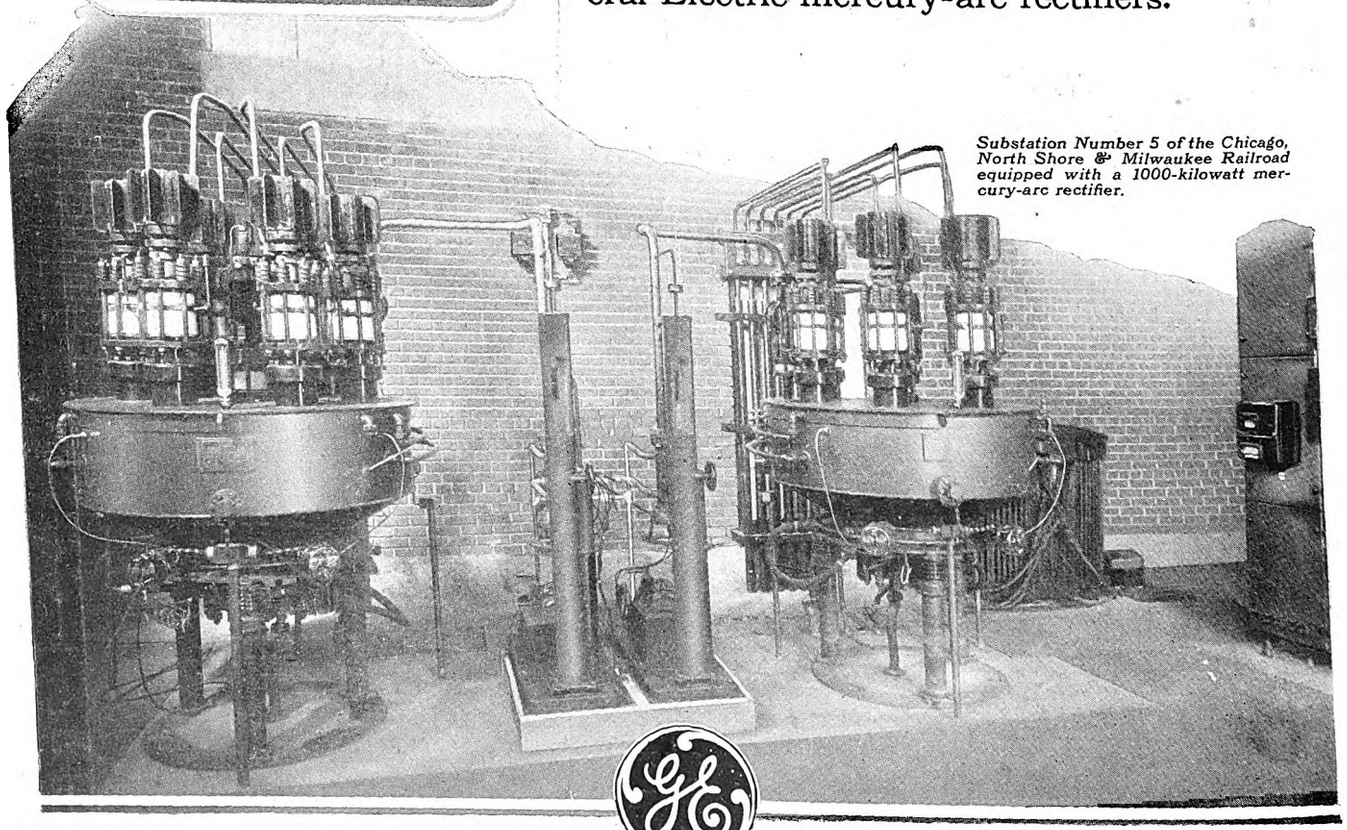
G-E rectifiers provide substantial power economy

Ten railway companies are now operating G-E mercury-arc rectifiers having a total rated capacity of 17,750 kilowatts, and two more are installing rectifiers having an aggregate rating of 6,500 kilowatts.



During a year and a half of operation on the Chicago, North Shore and Milwaukee Railroad, General Electric mercury-arc rectifiers proved eight per cent more efficient than synchronous converters in the same service.

You, too, can increase the efficiency of your substations, especially if the load factor is low, by taking advantage of the high efficiency which characterizes General Electric mercury-arc rectifiers.



Substation Number 5 of the Chicago, North Shore & Milwaukee Railroad equipped with a 1000-kilowatt mercury-arc rectifier.

130-8

GENERAL ELECTRIC

GENERAL ELECTRIC COMPANY, SCHENECTADY, N. Y., SALES OFFICES IN PRINCIPAL CITIES

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ELECTRIC RAILWAY JOURNAL

McGraw-Hill Publishing Company, Inc. MARCH 31, 1928 Twenty Cents Per Copy

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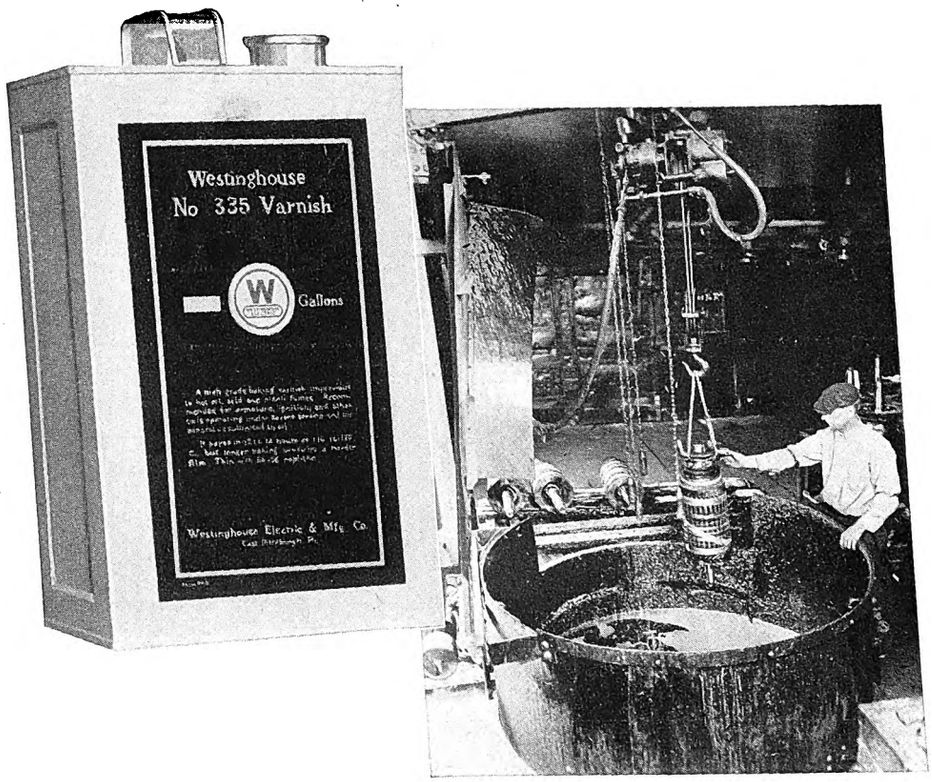

Varnish

That Reduces Insulation Mortality

Westinghouse Insulating Materials

- Treated Fabric Tapes
- Untreated Tapes
- Cord and Thread
- Sleeving
- Treated Papers
- Treated Fabrics
- Untreated Papers
- Untreated Fabrics
- Micarta Sheets
- Micarta Tubes
- Micarta Formed Shapes
- Mica Sheets
- Mica Tubes
- Varnishes
- Paints
- Japans
- Enamels
- Insulating Compounds
- Insulating Glue
- Transformer Oil
- Switch Oil

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Electric Railway Journal

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Terminable Permits of Advantage Both to Investors and Consumers

MORE rapid adoption of the terminable permit, in place of the fixed term franchise has not come, according to Prof. E. R. Dillavou in this paper for March 24, because of two important things: First, the type of law to be enacted and, second, the kind of regulation best adapted to its use. When these two questions are settled he feels the way will be open for its more general adoption. Since the life of the utility becomes indefinite, the terms of the agreement become doubly important. But if it is now possible to draw up franchise laws that are satisfactory and will stand the test of the courts, there is no reason why they cannot be drawn for the terminable permit equally well.

As to the question of regulation, there is a great difference of opinion. Rates and service must be adjusted from time to time so that the utility can provide adequately for the community's wants, earn a fair return on the capital invested, and attract new capital as well as lay aside a sum sufficient to permit the utility to perpetuate itself.

Any fair-thinking body of men should be able to regulate in this manner. Naturally, local regulation is preferable, particularly with respect to service, since those intrusted with the duty are able to determine more closely the needs of the public. The ever-present difficulty, however, is that local politicians will not permit regulation to be so fair as when the supervisory power is removed outside their jurisdiction. Keep men of this type out of office and local regulation is easy.

The advantages of the terminable permit are so great that sight of them should not be lost for an instant. The plan has been adopted to a greater or lesser extent in nine states, and it can well be extended to all the states. As Professor Dillavou points out, the benefits are certain—neither the investors nor the consumers should be deprived of the advantages which are derived from the use of terminable permits.

From the City of the Unusual

STARTLING in what it may portend is another move made by Mitten Management, Inc. It has to do with a working arrangement entered into by Mr. Mitten with the Amalgamated Association. In the quiet and calm of Atlantic City the Mittens and the Mahons, as the official statement puts it—meaning T. E. Mitten and A. A. Mitten and W. D. Mahon and O. L. Mahon, father and son respectively, through the good offices of W. Jett Lauck, former member of the War Labor Board, were brought to see the planet Mars in the same way through the same end of the telescope.

It is a significant move. Of that there is no doubt. On that account the official statement covering the agreement is published in full elsewhere in this issue. Naturally, things immediate and things futuristic have been read into the document by the commentators. It was only to be expected that there should be some speculation. It may be that the real significance of the agreement now reached is contained between the lines rather than in them, but so far as Philadelphia and Buffalo are concerned, conditions there are to remain as at present, in order that the standard of economic excellence of these companies be the criterion by which union performance in co-operation with Mitten Management on other properties is to be measured.

As for the future, it is specifically stated in the memorandum that when co-operation between the Amalgamated and Mitten Management has developed to a point where the results are equal to those obtained on the Philadelphia and Buffalo properties, the matter of union-management agreements on these properties may be discussed and be made the basis of further agreement. The memorandum has been referred to as "one of the most extraordinary developments in the long history of the labor movement." That statement may, of course, turn out to be no exaggeration. In any event, the move just made is one that will again turn the attention of the industry to Philadelphia, the city of the unusual in railway operation and publicity.

Will the Trackless Trolley Regain Favor?

WHETHER or not there is an opportunity for the resurrection of the trackless trolley in this country, is a transportation question that justifies serious consideration. During the past several years this vehicle has not made much headway and after arousing some interest its popularity has actually waned. This in itself, however, is far from convincing evidence that the trolley-operated trackless vehicle does not have a place of considerable importance in the scheme of local transportation.

An analysis of the inherent characteristics of the trolley bus reveals no basic limitation. On the other hand there are indications which point strongly in the direction of a revived interest in its possibilities. Rapid strides have been made in the design of chassis for highway transportation vehicles since the early trackless trolleys were tried in this country. There has been likewise, rapid progress in the design of electric motors and control for highway vehicles. Although these latter developments have come about because of the attention given gas-electric drive for buses, they make available new equipment adaptable for the trackless trolley which opens up entirely new design possibilities for the latter vehicle in comparison with what was available at the time of early attempts.

There are two important factors, other than design, to be considered in determining the possibilities of the

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trackless trolley. The first is whether or not the substitution of electric motors for gasoline engines is a sufficient advantage to overcome the limited flexibility and the overhead construction required for the trolley bus. The second factor is that when attempts were made to install the trackless trolley in this country, a demand arose for the operating companies to provide paving; whereas, the elimination of the trolley wire and the use of straight automotive equipment obviated this requirement.

There is no justification for this public discrimination from the standpoint of fundamental transportation economics, but the question of paving did become a large element in eliminating the trolley bus. It is obvious that the choice between gas power and trolley power thus became a question of pure expediency. During the past several years the public mind has gradually been acquiring a more liberal viewpoint regarding paving, and it is probable that this issue, which so effectually blocked the trackless trolley in some locations, can now be surmounted.

In the field in which gas buses have been adopted as "street cars on rubber tires"—not for the development of a distinct and preferential class of service but as an expediency to give low priced transportation where track reconstruction requirements or traffic sparsity constituted economic limitations to street cars, the trackless trolley seems to offer distinct advantages in its own favor. It has the flexibility to draw up at the curb and to pass other vehicles on the street. Properly designed, it can be made easy riding. On pneumatic tires it may be made the quietest vehicle on the street. But by far its greatest advantage, within a given range of traffic density, lies in its operating economy. There is no track to maintain. There are substantial operating economies to be derived from cheaper power and simplified construction which more than offset the cost of overhead line investment.

For these several reasons, the operation of the eight new trolley buses built for the Manila Electric Company, Manila, P. I., and described in an article in the March 10 issue of ELECTRIC RAILWAY JOURNAL, will be watched with interest. They were designed especially for this class of service and their operating figures should be a guide as to the further possibilities of this type of vehicle in the United States.

Chicago's Need—Enabling Legislation

PUBLIC assurances, given through the annual statements of the Chicago Surface Lines and the Chicago City Railway by Messrs. Blair and Busby, and the earlier report of the Chicago Rapid Transit Company, should serve as a fitting prologue to the resumption of transit negotiations scheduled for early April.

In the Surface Lines report it appears that much has been accomplished during 1927. President Blair refers to the continued and consistent increase in riding. He looks to the future enactment of enabling legislation by the state, and for the formulation of a plan between the city and the companies adequate for the needs of Chicago. It is indeed gratifying, as the annual report of the Surface Lines indicates, that despite the expiration of the Surface Lines franchise more than a year ago, despite the impossibility of borrowing capital for the making of much-needed extensions and improvements the Chicago management during 1927 constructed more track than any other street railway in the country. So far as the elevated lines are concerned, the Rapid Transit Company, although indicating in its report that the fare was insufficient to produce a fair return upon the value of the property, did report fairly constant traffic figures for the past six years and an increase in car-mileage in 1927 over the year preceding.

But the transportation situation in Chicago cannot rest on its 1927 laurels any more than any other institution can sell itself on its past achievements. The matters now of paramount importance lie in the future. What extensions, consolidations, unifications or other steps toward improved transportation service can be expected? What subway proposals and elevated problems can be worked out which will satisfy complaining factions? Are most of the proposed bills to go by the board while time, money and opportunity are wasted? In Mr. Insull's trite but true remark made at the annual meeting of the Commonwealth Edison Company is the answer—a settlement can be made only "by close co-operation among the city authorities, the citizens, the railway companies and the various agencies which create public opinion." It is to be hoped that this year's annual statements will do much to assure the people of Chicago of the efficiency with which their transportation systems are being managed. In this respect they are documents of tangible evidence that should carry weight with every thinking citizen who inspects them.

Congress Indicts Itself in the Esch Case

REJECTION by the Senate of the nomination of Commissioner Esch for reappointment to the Interstate Commerce Commission cries to heaven. Press and public rightly had hoped up to the last minute that wise counsel might prevail on the floor of the Senate at least, even if it did not do so in the committee on interstate commerce. But on March 17 the Senate voted 39 to 29, after five hours of debate, to sustain the unfavorable report made by the committee on March 5.

Sad, indeed, is the commentary to which the rejection applies. There is no question about the ability of the man. There is no question about his fitness for office. There is no question about his sincerity and conscientiousness. He has been on the commission since March, 1921. Previously he served 22 years in the House of Representatives, and during his membership was co-author of the Esch-Cummings transportation act. Last December he was nominated for reappointment by President Coolidge. In what did he offend? It has been hinted that Mr. Esch changed a point of view out of desire to win reappointment. This charge against him is based on the fact that he changed his vote in the Lake cargo case, whereby the railroads serving the Pennsylvania mines were permitted to reduce rates to lake ports, thus increasing the difference in favor of the Pennsylvania fields as against the mines in West Virginia, Virginia, Kentucky and Tennessee.

Therein lay his offense. In consequence his nomination was opposed particularly by the Senators from the Southern coal states. The issue involved really transcends that of personalities. The rejection of Mr. Esch instances the length to which an opposition is prepared to go that is selfish in its outlook. The adverse vote in his case is a thrust at the whole idea of regulation.

Congress has its own troubles. It is not qualified to deal with questions that properly come before the Interstate Commerce Commission. By attempting to do so

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by pressure as in the case of Mr. Esch it breaks down confidence in the commission as a government agency that should be free from any possible taint of bias, political or otherwise. The commission was created by Congress mainly to regulate rates because experience and reason showed that a small body of men especially qualified and devoting all their time to the matter could be expected to function competently. That the commission has done. True, it may make mistakes. Mr. Esch may have been wrong in his changed stand on the coal freight case. But his courage in changing his vote after a review of additional evidence is to be commended in principle rather than condemned. The judicial character of the commission's work demands that it be as inviolate from pressure from any source as is the United States Supreme Court. But that apparently is not so. By its handling of the Esch case, Congress has indeed visited upon itself a terrible indictment.

Horse-Trading Methods Have No Place in Modern Business

MANUFACTURERS and purchasers are equally responsible for unsound practices in the buying and selling of industrial products. Purchasers are tempted to beat down price levels. Manufacturers are accused of cutting prices in their eagerness to obtain orders in the scramble of competition. The result is that a large portion of the business thus transacted is in utter disregard of sound business and economic principles. Some of the more flagrant practices encountered in the utility industries were outlined in an article by Earl Whitehorne on page 524 of last week's issue of ELECTRIC RAILWAY JOURNAL.

As Mr. Whitehorne points out, the time must come when the purchasing agent will no longer be valued for his penny-squeezing ability, but for his skill and intelligence in selecting material on the basis of its quality and performance. Likewise, manufacturers have the responsibility of developing greater sincerity in selling. Their bids must be final, for only such bids protect both the buyer and the seller by banishing the unseen menace of deceit. Any other purchasing or selling standard is unsound. It stifles healthy competition and encourages horse-trading methods in the conduct of business. Under the modern business code both parties should profit from a buying and selling transaction. If a manufacturer is forced or tricked into taking an order at a loss, it is the industry which ultimately pays the difference with interest—if the manufacturer is to stay in business. A bid is the written word of the manufacturer and it should not be subject to revision. But when a manufacturer loses an order under such conditions it is good for the industry in general that he know a little more about the reasons why he loses than at present. There seems to be no single good reason for the air of secrecy which is sometimes thrown around the business of buying and selling equipment or supplies.

True, not all manufacturers dicker after their price is once given. There are some who have the courage of their convictions and hold fast to the price which they know is right. There are also some purchasers who do not haggle. They pick the products that are acceptable and the low bidder gets the order. On the other hand the number who disregard modern ethics of business is appalling and their tactics would take volumes to explain. It is not good for industry that such conditions exist and it is not safe for industry that they continue. Is it not time for American business to put an end to blind bartering and wit matching as factors in the buying and selling of industrial products?

An Enticing Annual Report

CONSIDERED as a statement of stewardship under service-at-cost the report of President Draper of the Cincinnati Street Railway for the year ended Dec. 31, 1927, is a very interesting document. It shows that there was an increase of 7,224,704 revenue passengers in 1927 over 1926. Expressed in other terms, this is an increase of 7.5 per cent. This, however, is only one of the many things of interest in the report. It appears that the present rate of fare of 8⅓ cents for tickets and 10 cents cash is almost exactly the right figure to provide for all the requirements for the proper operation of the company. This, of course, is a happy thing for the company and for the public which it serves. The public has a right to know about the affairs of the company and it does know under what Mr. Draper has set down. It knows the bad along with the good. It knows, for instance, that the loss on the buses was $152,426, but it also knows that this loss is being cut down and that further improvement is promised.

Mr. Draper has explained that it is the policy of the company to put the track in condition before ordering new cars. But more than that. He goes on record to the effect that the expenditure of additional money on obsolete equipment should be abandoned in favor of the purchase of new rolling stock. He says unequivocally that as yet it would appear that mass transportation, particularly in large cities, can best be handled by the familiar form of street cars improved and developed to meet special needs, but he says "there has now been developed a new motor coach unit of greater carrying capacity which must be reckoned with and which may cause street railway operators to change their opinion as to the availability of the motor coach for use in city transportation." Thus there is presented the opinion of the head of the property about the value of the new electric railway equipment balanced against the view that he holds about the bus.

So the significant references might be expanded. One other, however, does deserve consideration. To say the least it is unusual. It takes into account public recognition on the president's part of the work of the newspapermen who have been so thoroughly interested in the efforts to improve the system, and it expresses a full measure of gratitude to the employees for their many acts of co-operation in selling the service and to all citizens generally who have helped by their praise and advice and criticism—and even by their complaints.

Never is the report fulsome. It might be advanced that all these and many more are things often spread before the public in similar documents. That is true, but it is the way the things have been made known that counts. The report would probably not be appraised 100 per cent from the standpoint of accounting. But it is a human document. Consciously or unconsciously the report reflects a journalist's keen interpretation of news values. It is, of course, too much to say that it is to be regretted that more newspapermen are not presidents of railways, but it is not too much to say that it would be better if more journalists had a hand in the preparation of annual reports.

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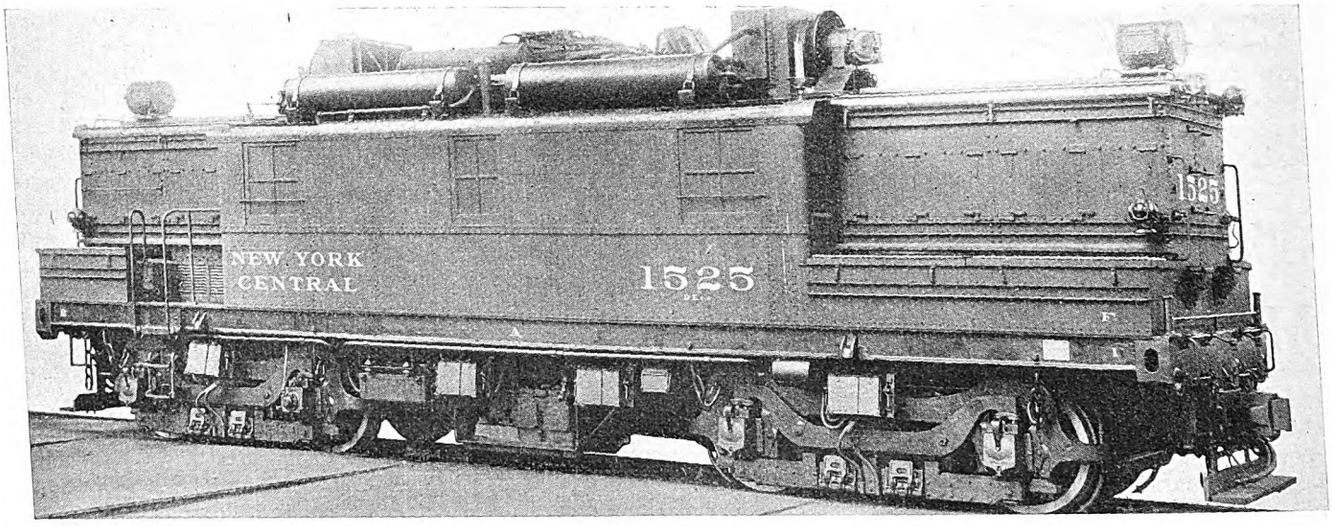
Combination Switching Locomotive

Meets Unusual Requirements

Locomotive of New York Central uses either a battery charged by an oil engine-generator, or external power from overhead or third rail



Combination switching locomotive designed for different characters of service in New York City yards

TESTS were conducted recently by the New York Central Railroad of a new battery-oil-electric locomotive, designed for switching service in the New York City terminals and yards. It is primarily intended for use in the freight yards on the west side which are not electrified and where part of the time the locomotives are required to operate through city streets. Switching service requires that a locomotive respond quickly to applications of power, which in turn means that a relatively large amount of power must be available for short periods, even though the average energy requirement over an eight-hour shift is small. In order to secure this fast action from this locomotive it is equipped with a storage battery of relatively large capacity which can easily supply the high momentary currents required for switching service.

Since the locomotive will be used mainly in yards not electrified, the engine generator set, consisting of a 300-hp. oil engine connected direct to a 200-kw. generator is arranged for charging the battery. This engine is capable of supplying ample power to keep the battery fully charged for all switching service. The generator is so designed that if it is run at the same time power is being supplied to the traction motors it will divide the load with the storage battery under periods of heavy output without overloading the engine, and will return automatically to charging the battery as soon as the load has decreased. The voltage at light load is so proportioned that there is no danger of overcharging the battery.

As the generator capacity is more than enough to supply the average energy requirement of the locomotive over an eight-hour shift, it will not have to be run all the time. This is especially advantageous in connection with work in the lower west side. At places where switching locomotives have to go inside of buildings the locomotive can be operated from the battery alone.

It should be noted that the engine is run at constant speed under the control of the governor, and this permits the maximum fuel economy to be obtained.

The storage battery consists of 218 cells, the maximum number so far used for locomotive service. This number is made possible by grounding the mid-point.

As the locomotive will be called on at times to operate over tracks which are electrified, third-rail shoes are provided and also an overhead collector. This permits the engine and battery to be disconnected from the traction motors when running in electrified districts. As the west side electrification is extended this feature will become more and more important. The third-rail shoes are of the folding type to permit operation in city streets.

The mechanical portion was built and the locomotive equipped by the American Locomotive Company at its Schenectady plant. The storage battery was supplied by the Electric Storage Battery Company and all other electrical equipment by the General Electric Company. The oil engine was furnished by the Ingersoll-Rand Company.

The locomotive was designed by the New York Central Railroad's electrical engineering department working with the General Electric Company, the Electric Storage Battery Company and the Ingersoll-Rand Company.

Locomotive is Swivel Truck Type

The locomotive is of the swivel truck type. The cab has three sections, the batteries being carried in the end sections and the oil engine in the central section.

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The running gear consists of two four-wheel swivel equalized trucks. The truck frames are of the Commonwealth cast steel type with transoms and pedestals cast integral. These are carried on semi-elliptic springs to the equalizers which in turn are carried on the journal boxes through quiver springs. The transom is a hollow box casting which serves as a duct for the motor ventilation. Truck center plates are carried on the transom and the air for ventilation is conducted through the center of these plates into the transom and from there distributed to the two motors carried on the truck. Wheels are solid rolled steel with 44-in. diameter. The axle diameters are 8 in. at the motor bearings, and 9 in. at the gear fit; with 8x14-in. collarless journals.

The cab platform is a Commonwealth steel casting. The cab itself is of structural material riveted to the platform. The storage batteries are arranged in three tiers convenient of access from the outside. The central section of the cab has in addition to the power plant and the control apparatus, two small operating compartments for the enginemen. Good vision along the track is obtained from the engineer's seat as the battery section does not project sufficiently to interfere.

Doors give access to each operating compartment from the outside and to the power plant compartment from the operating compartments. There is a hatch in the roof of the central compartment directly above the oil engine to permit its removal.

Electrical Equipment Designed for Both Internal and External Power

The locomotive is equipped with four GE-286, 600-volt d.c. single-geared commutating pole traction motors. Each motor is geared to the driving axle through a 72-tooth gear and seventeen-tooth pinion. These motors and the gear ratio are the same as used on the New York Central Class Q electric switching locomotives. The continuous rating of the motor is 330 hp. at 600 volts and the one hour rating 415 hp. at 600 volts. At this rating of the motors the locomotive will develop a tractive effort of 34,000 lb. It will develop a tractive effort of 60,000 lb. with 900 amperes per motor. The operating characteristics of the locomotive and the tractive efforts available at various speed are shown in the accompanying group of curves.

Weights, Dimensions and Battery Characteristics of the Locomotive

Weights

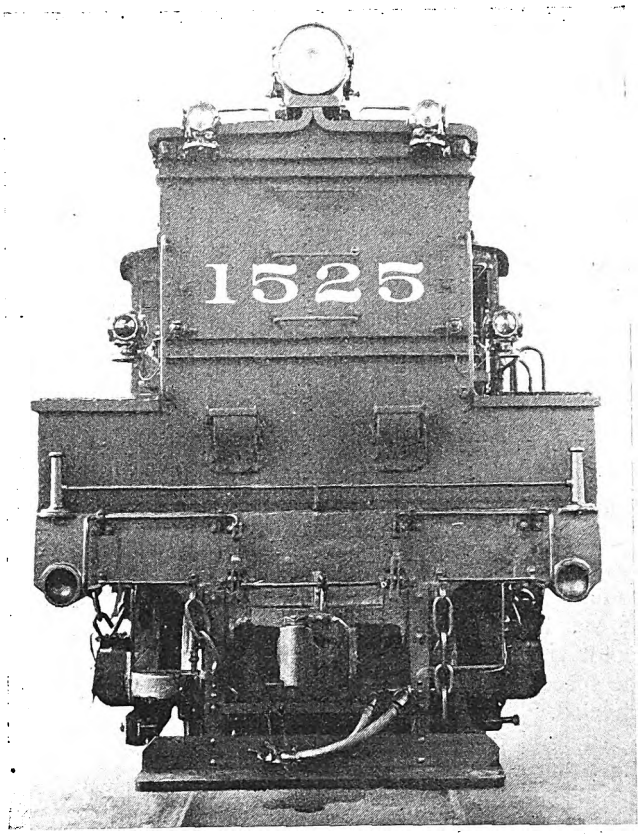
Locomotive complete	257,000 lb.
Mechanical equipment	110,000 lb.
Battery	34,300 lb.
Motors	36,400 lb.
Engine and generator	28,800 lb.
Radiators and fans	2,700 lb.
Control	18,800 lb.
Air compressor and brakes	4,800 lb.
Miscellaneous	21,200 lb.

Dimensions

Length over coupler pulling faces	46 ft. 8 in.
Wheelbase	34 ft. 1 in.
Rigid wheelbase	8 ft. 3 in.
Height	14 ft. 8 in.
Width	10 ft. 2 in.
Tractive effort one-hour rating of motors	34,000 lb.
Speed at one-hour rating	18 m.p.h. on external power 8 m.p.h. on internal power
Maximum speed	40 m.p.h.

Battery Characteristics

Ampere-hour capacity at six-hour rate	680
Average volts at six-hour rate	432
Kilowatt-hour capacity at six-hour rate	294
Maximum discharge rate in amperes	3,000
Maximum kilowatt discharge rate	180
Approximate weight of battery, pounds	34,300



The battery sections are narrow enough to permit an unobstructed view by the engineer

Two motor blower sets furnish air for ventilation of the traction motors. Air for the air brakes is supplied by one CP-26-C4 compressor having a displacement of 120 cu.ft. of air per minute when running at 600 volts.

The control is type PCL, non-automatic with individual electro-pneumatic contactors. It is arranged for operation from either end of the locomotive. It is also arranged to permit the following methods of operation:

1. Internal power: (a) From storage battery alone. (b) from storage battery and engine-generator together.
2. External power: (a) From third rail. (b) From overhead.

The control is arranged to connect the traction motors automatically to internal power should the external power fail at any time (which may be due to running off the end of the third rail) and to restore the connection automatically to external power when the controller is shut off after external power is again available. Indicating lights show whether operation is from internal or external power.

Resistance steps are used for accelerating the locomotive both with internal and external power. The controller steps and motor groupings are as follows:

Ten resistance steps, motors connected four in series.

One running position, motors connected four in series.

Six resistance steps, motors connected two in parallel. Two such groups in series.

One running position, motors connected two in parallel. Two such groups in series.

Seven resistance steps, motors connected four in parallel.

One running position, motors connected four in parallel.

The locomotive is protected against short circuits by a type JR high-speed circuit breaker. The individual mo-

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tors are protected against overloads by overload relays which trip out the high-speed circuit breaker.

Storage Battery Has 680 Amp.-Hr. Capacity

The storage battery consists of 218 cells of MVA-41 Exide-ironclad battery. The ampere-hour capacity of the battery is 680 and the kilowatt-hour capacity 294 at the six-hour rate of discharge. All cells are connected in series for connection to the generator and traction motors but the mid-point is grounded to reduce the maximum potential to ground.

The control, lights, etc., are connected between each terminal of the battery and ground and arranged to equalize so far as possible any unbalanced loads on the two halves of the battery. The control is always connected to the battery even when running on third rail.

The locomotive has a complete metering equipment to assist in studying its utility for service and determining what, if any, modifications should be made in the equipment for future locomotives of this type. Ammeters and voltmeters at each operating position indicate the current of one traction motor and the voltage on the traction motor circuits. A speed recorder indicates and records the speed in miles per hour and registers the total miles traveled.

An ampere-hour meter indicates the state of charge of the battery. The zero point of the scale indicates full charge and the pointer moves forward or backward to indicate the ampere hours drawn from or supplied to the battery. An integrating ampere-hour meter connected in the battery circuit has two sets of dials, one of which indicates the total ampere-hours of discharge and the other the total ampere-hours of charge. One integrating watt-hour meter indicates the total energy passing through the traction motor circuits while another indicates the total energy delivered from the engine-generator set.

Oil Engine Is Constant-Speed Type; Has Direct Fuel Injection

A 300-hp. oil engine direct connected to a generator is provided for charging the battery. The generator is built with a drooping characteristic to match the voltage characteristics of the battery and to furnish power to the traction motors in parallel with the battery under various conditions without overloading the engine, or overcharging the battery. The engine generator set is started by running the generator as a motor from the battery.

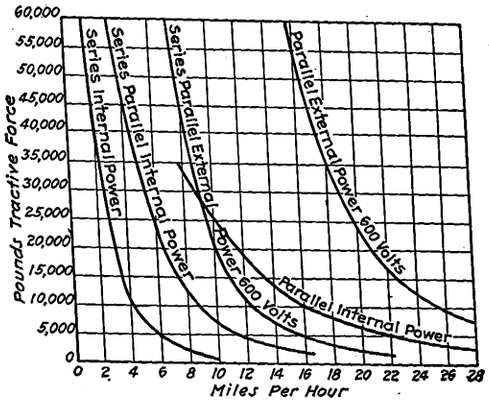
The engine is of the vertical, six-cylinder, four-cycle, single-acting, constant-speed type having direct fuel oil injection. The cylinders have 10 in. diameter and 12-in. stroke. Cylinders, cylinder heads, and combustion chambers are completely water jacketed.

Fuel oil is injected by two opposed spray nozzles in each combustion chamber, to which oil is delivered under pressure by an injection pump driven from the main shaft. No compressed air is used for fuel injection. Ignition is produced by the heat of compression only. One fuel injection pump serves all cylinders. The fuel oil distribution is obtained by a distributor timed to admit oil to the spray nozzles of each cylinder in their proper firing order. The storage tanks have a capacity of 200 gal. of fuel oil and are sufficient to operate the engine at full load for about ten hours.

The lubricating system is entirely enclosed and of the forced feed type. Lubricating oil is pumped to the moving parts of the engine by a gear-driven pump in the crankcase. Oil in contact with the cylinder walls is passed through a filter and returned to the crank case oil reservoir.

A closed cooling water system is used on the engine. The water is circulated by a centrifugal pump driven from the crankshaft. Radiators for cooling the engine circulating water are on the roof. These radiators are made in two sections, each ventilated by a motor-driven fan.

The engine is the same type as that used on a large number of oil-electric locomotives, with the exception that on this locomotive it is run at constant speed under the control of the governor.



Tractive efforts at various speeds, operating from internal or external power

The accompanying table gives the approximate weights and dimensions of the completed locomotive.

Combating the Would-Be Good Samaritan

NEARLY every electric railway company is losing considerable revenue because automobile owners insist on picking up not only their friends for short trips, but also total strangers who could just as well ride to their destinations on a near-by car line. The loss of this patronage, in the aggregate, is a considerable amount. One of the companies which has attempted to combat this evil is that at Little Rock, Ark., and the means followed by the Arkansas Power & Light Company have an interest for others who are trying to reduce losses of this character.

One method used is to carry occasionally in its advertising space in the daily papers accounts of injuries or losses suffered by automobile owners who followed this practice. Such an advertisement the early part of this year cited the case of a St. Louis professor who was atttacked by two young men he had picked up and carried in his car, as well as of a suit brought in a local court against the automobile owner by such a free passenger for $500 damages for an alleged sprained wrist he claimed to have sustained while riding in the Good Samaritan's automobile. Still another case was mentioned where a local man had to pay $5,000 damages to an automobile guest who claimed to have been injured in an accident while taking a social ride in his host's car.

In the advertising which has been carried on this subject the company has made no definite appeal to the public to discontinue the practice on the ground that the street railway is being deprived of just revenue. It is the belief of the company that the public is not particularly interested in this phase of the problem.

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Fast Schedules Bring Car Riders

By E. J. McIlraith
Staff Engineer Chicago Surface Lines,
Chicago, Ill.

The author, speaking before the meeting of the Illinois Electric Railway Association this month, showed clearly that fast schedules are within the ability of almost any electric railway, and without expenditures or complications

RARELY is attention paid to schedules and schedule-making. The title of this paper really calls for a discussion of fast schedules, or, in fact, consideration of speed, and not of the job of scheduling. We must assume in the beginning that schedules as written can be maintained on the street. A schedule that is not reasonably observed or that cannot be operated is, of course, undesirable. So we really are considering the advantages of fast operation or of quick transportation.

STREET cars need not apologize for being on the street, and operators should develop a recognition that each street car is as important as from 40 to 60 individual automobiles. Trainmen should be encouraged to operate safely at higher speeds. . . . Trainmen should be ready to avoid accidents but should not let automobiles assume superior rights.

What is fast operation of street cars? Nearly all citizens today are automobile drivers. Those few who do not own automobiles or drive them, ride in them often enough so that practically everyone thinks in terms of automobile speeds, and it is speeds of the open road they remember. The word speed always seems to mean something over the legal speed limit. It is from 35 m.p.h. up, that represents the popular idea of speed today, and movement of less than 20 m.p.h. is a drag.

Comparative Car and Auto Speeds

People are not accustomed to thinking of trips about town being made at an average speed of 15 m.p.h. from start to final stop, but if you ask a driver how fast he makes a given trip in town his likely answer would be "about 25 m.p.h." The average top speed while moving is what stands out in a driver's mind. So it sounds rather a contrast to mention average speed of a street car which in most systems would be an average of about 10 m.p.h. from terminal to terminal. The Chicago Surface Lines feels it has reason to be proud of its average speed between terminals, including time used at all intermediate stops, which is 11.2 m.p.h., and is higher than the speed of any other city system of which we know.

While such speeds sound low to the average citizen, who thinks in terms of his running speed not including slow-downs or stops, it is really unusual in driving in large cities for automobiles to average more than 15 m.p.h. between origin and destination. As congestion grows automobile speeds suffer seriously. Not much further increase for the street car can be expected. A vehicle making seven stops per mile, each of seven seconds' duration, cannot average as much as 15 m.p.h. even if on a private right-of-way. No matter how large motors are used the limitations of starting and stopping keep the average speed below 15 m.p.h. Of course with smaller motors a lower speed results. Increasing the number of stops per mile has an enormous influence, and increasing the length of stop is also a serious source of delay. The sense of greater speed is given to the passengers because between stops the street car may run as fast as 30 or 35 m.p.h.

Operation as fast as possible is an absolute necessity to get business in these days of impatience and of speeding automobiles. Saving in time without recklessness is the thing we must drive at. The customers must be rushed through the trip without being made conscious of any danger, but rather with a feeling of comfort and security. The street railway must establish in the minds of the people it wishes to serve the opinion that its service is regular and dependable and moves with the best possible speed and evident efficiency.

The train crew, whether one-man or two-man, must give the impression of prompt, efficient, alert attention to the job of moving the car safely and speedily over the street. This does not mean giving the passenger a sense of impatience and haste. The careful, efficient trainman who makes it most convenient for passengers to get on or off, who accelerates his car as rapidly as possible but smoothly, who brings the car to rest rapidly but skillfully, inspires confidence, and the passenger can be at the door ready to get off the moment the door opens instead of remaining clinging to something for safety.

It is not reckless haste that develops maximum speed, but competent, careful attention on the ways of eliminating waste of fractions of a second. Cars need not accelerate or brake at rates uncomfortable to passengers.

The big loss at present in braking efficiency is due to the slowness of getting braking under way. Many cars require two seconds for the braking pressure to build up in the cylinders and the brakes to get in contact with the wheels. In two seconds a car at 25 m.p.h. will move 75 feet.

Automobile brakes begin to function almost instantly, and no distance is lost between the time a man decides to brake and the time brakes are applied. Then, since automobile passengers are seated, the rate of braking can be more rapid than could be tolerated in a street car.

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Further, the friction between rubber tires and pavement is better than the friction between the steel wheels and steel rails.

Improvement in braking will not come from increasing the rate of braking, but must come from reducing the wastage of time in getting the brakes applied. The present braking mechanism is not well suited to modern car operation.

The acceleration of cars can probably best be speeded up by automatic control. Of course, this is expensive, adds to maintenance costs and increases the chance of trouble. Thorough training of motormen will serve the same purpose. Motors of sufficient size are needed, but even with the best equipment the speed of a car will not be satisfactory unless the crew is alert, active and competent in saving moments of needless delay.

Few managements are today pressing the trainmen and the supervisory force to get this actual speed-up of the lines. The usual city crew gives the impression of leisure and indifference. There has been altogether too little attention paid to getting higher speed because most managements have accepted the idea that accident prevention demands slow speed and timidity. In many cities the motormen are actually afraid to move with certainty and as if they had a right to use the street. They are taught to hold back until all other traffic has gotten out of the way. Street cars need not apologize for being on the street, and operators should develop a recognition that each street car is as important as from 40 to 60 individual automobiles. Trainmen should be encouraged to operate safely at higher speeds. True accident prevention should build better operating principles into the minds of the trainmen, but not at the sacrifice of all their rights to move. Trainmen should be ready to avoid accidents, but should not let the automobiles assume superior rights. Analysis of accident causes does not show that fast operation properly handled creates accidents.

The training of the motorman and of the conductor, and the use of care to get them working in sympathy with a sound, well-planned viewpoint is a major portion of the problem of obtaining higher speed and lower accident costs.

If in the city that has the most intense use of streets, an average of 11.2 m.p.h. can be maintained for street cars, then in the smaller cities higher average speed should be possible because of relief from traffic interference and because of a smaller number of stops per mile. When speed is increased either the same number of cars will give a closer headway, or a smaller number of cars will maintain the same headway.

Increasing the speed by reducing wastes of time will certainly produce more business. It is the increased speed without the sacrifice of personal comfort for the passenger that is largely responsible for the growing business of the Chicago Surface Lines. In most large cities the street railway business is not growing. Perhaps a major part of the reason is because too little attention is given to increasing the rate of speed. Some cities are using more and more trains with longer headways. Perhaps the slower operation of trains and the longer headway has something to do with the decrease in the number of passengers obtained.

USUALLY remarkably good improvement in speed may be obtained with no other change than training of the entire organization from the manager down so as to have each one working actively to discover ways and means of eliminating waste of time and carelessness.

Many little things can become serious in producing low speed of operation. Here are a few that are within the control of the company without cost for changes in equipment:

Motorman accelerates slowly or brakes slowly.
Motorman stops car in the wrong place.
Doors opened slowly after the car has come to a complete rest.
Car equipped with interlocked door control.
Motorman coasts too much.
Brakes slack or braking equipment slow to operate.
Stops too close together.
Overhead wiring poorly set and requires slow speed to keep trolley wheel on the wire.
Car crew permitted to buy lunch, to stop for drink of water, to get transfers or change, or to visit carhouse at other points than terminals.
Track special work including curves in such condition as to require slow operation.
Switches operate hard.
Crew required to operate slowly over special work of all kinds when slow speed should only be necessary past facing switch points.
Low joints or broken rails.
Defective circuit breaker or circuit breaker set for too low current.
Improper setting of traffic lights or careless control by traffic officer.
Lack of safety zones at loading points.
Slow loading at heavy transfer points.

Of course many other small operating factors must be constantly watched, and should be continually improved upon.

A company need not wait to get new equipment, or to widen the doors, or to change the motors, or to make any other major and expensive change in order to improve its operating conditions. Usually remarkably good improvement in speed may be obtained with no other change than training and supervision of the operating force. This means training of the entire organization from the manager down so as to have each one working actively to discover ways and means of eliminating wastes of time and carelessness.

Most visitors to Chicago are looking for some big item that is responsible for the higher speed. They seem disappointed when informed that it is produced merely because of careful attention to the details. This attention to details is a measure of effectiveness of the management. If speed could be purchased by buying something which when installed would produce this speed all properties would probably have it.

All railways can be improved. We cannot ever expect to reach perfection; we can drive towards it, and should approach as nearly to it as can be accomplished with the resources under our control. Financial and political limitations are severe on all properties. Managements are not always able to accomplish what they most earnestly wish, but this does not justify failure to do the best possible with the given circumstances.

We should never be content that we have reached the ultimate limit of accomplishment, but we can often be content that we are making the most sincere effort towards that accomplishment.

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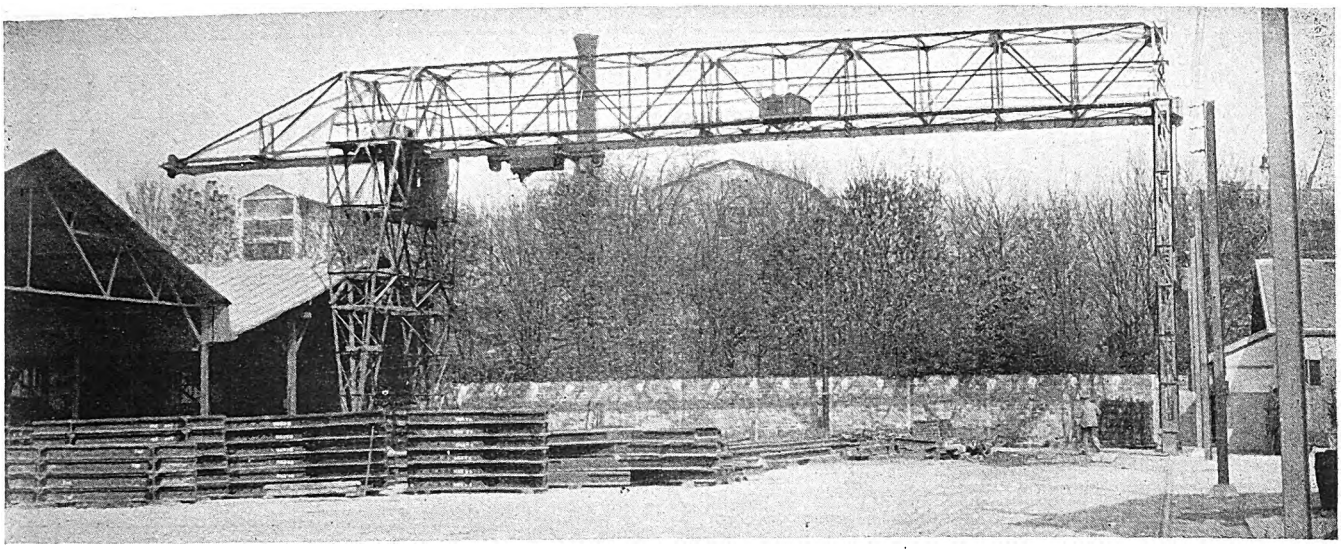


The track yards at Paris are equipped with traveling cranes and other modern machinery

European Track Construction

in Paved Streets

Points of resemblance and points of difference as compared with American construction are given. Extensive use is made of alloy steels in special track work. Paris methods are given in detail

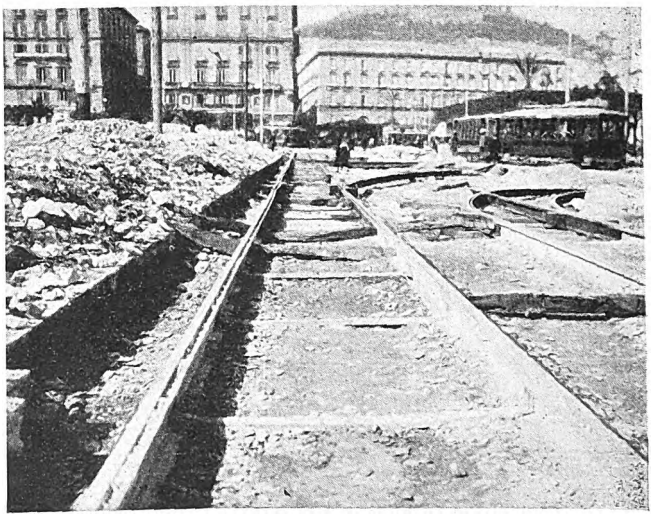
By Henry W. Blake
Senior Editor *Electric Railway Journal*

IN MANY ways European electric railway track construction is similar to that in America. Some track in paved streets is laid on wooden ties, and some is laid on metal ties or chairs embedded in concrete. The single-web girder rail, in distinction to the duplex rail with two webs, is now standard in Europe as in America. In straight track the usual rail length is 18 m., practically the same length as our 60-ft. rail. Rails as long as 24 m. (79 ft.) have been laid, but their use has not been continued owing to the inconvenience of handling them on the streets.

The three standard rail heights recommended at the International Electric Railway Convention in Paris in 1924 were 7.1, 6.3, and 5.7 in. (180, 160 and 145 mm.). These rails are illustrated on page 536, but have not yet been formally adopted by the Association. As will be noted, the width of the base equals the height in each case.

Manganese steel rail is generally used in special track work, although a number of the companies are experimenting with other alloy steels, such as chrome steel and nickel steel. Electrically operated track switches are used extensively.

The gage situation in Europe is practically the same as in the United States, though perhaps there is rather a larger proportion of narrow gage track. The two gages most generally used are 1,435 to 1,445 mm., which are practically the same as our 4 ft. 8½ in. standard gage, or a 1 meter (39½ in.). The latest tabulation available on gage is a report presented at the 1926 convention of



Track construction in downtown Naples. The timbers shown are simply to protect the fresh concrete and will be taken away after that has set

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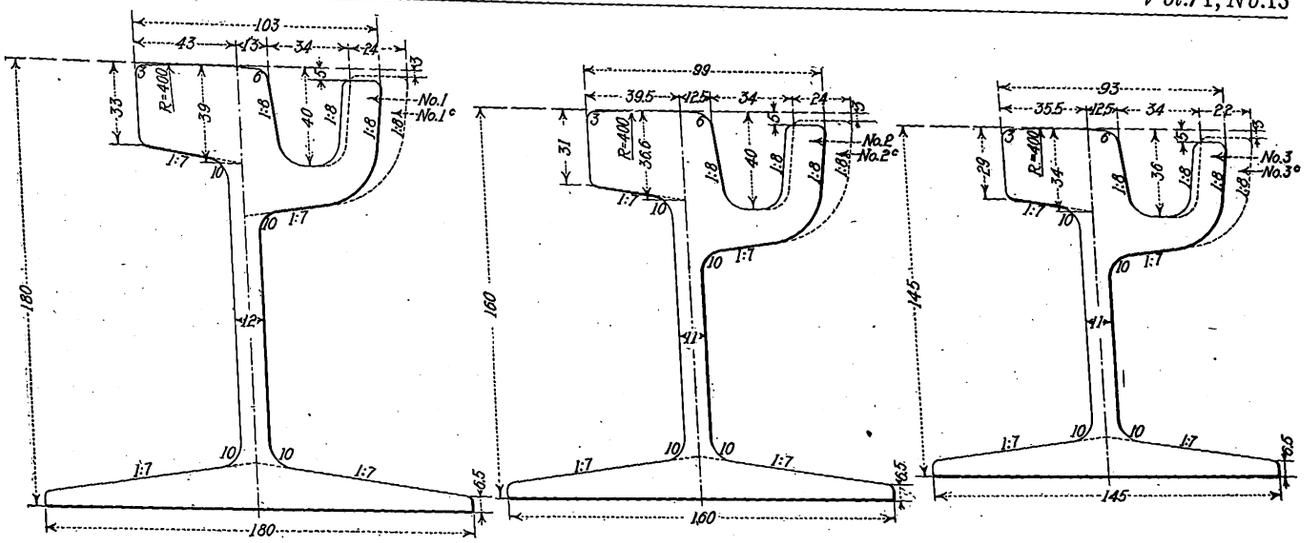


Sections of standard rails recommended at Paris convention

the International Street Railway Association. It showed that of 31 companies, mostly city lines, replying to a questionnaire, sixteen had standard gage, twelve a meter gage and three odd gages. A more extensive statement was given in a report at the 1910 convention of the same association. Although this report is now some eighteen years old, gages naturally are not changed often, so that it may be assumed that practically the same condition prevails today. At that meeting, 105 railway companies, mostly street railways, reported on gage as follows:

TABLE I—TRACK GAGES USED BY 103 EUROPEAN STREET RAILWAYS

Number of Roads	Gage of Track MM.	Gage of Track In.	Number of Roads	Gage of Track MM.	Gage of Track In.
1	891	35.0	31	1,435	56.5
1	915	36.0	7	1,440	56.7
48	1,000	39.4	4	1,445	56.9
1	1,050	41.3	1	1,450	57.1
3	1,100	43.3	1	1,453	57.2
1	1,345	53.0	2	1,458	57.4
1	1,416	55.7	2	1,524	60.0
1	1,430	56.3			

The two lines using the 1,524 mm. gage (5 ft.) were those in Moscow and St. Petersburg (now Leningrad).

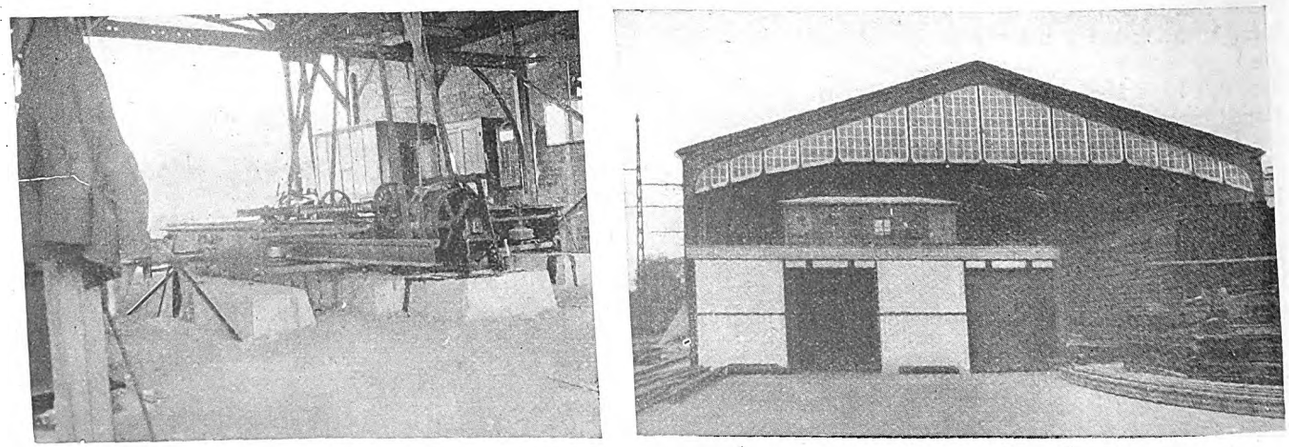
Points of Difference Almost as Many

Having considered the points of resemblance between European and American electric railway track construction let us consider the points of difference. They are almost as many as the points of resemblance just referred to.

In the first place, the track construction in paved streets in the larger cities in Europe, at least in those visited by the writer during a recent trip, seemed on the whole to be more substantially built than that usual on similar properties in this country. This was especially noticeable in view of the much smaller and lighter cars operated.

Where wood ties are used, there is a tendency to employ the most durable kind. Oak is not uncommon, and wooden ties, when installed, are usually treated with a preservative. Some track is laid on steel ties and some on chairs embedded in concrete, with the rails kept to gage by tie rods. In the newer sections the installation of tracks on reservations in the center of the street is not uncommon. There is considerable construction of this kind in Berlin and Paris.

Thermit joints are used more extensively in straight track than is electric welding. Of the 36 companies that replied to a questionnaire on the subject of rail joints at the 1924 convention of the International Street Railway Association all but one were using thermit, although it was not standard on all of those so reporting. Bolted joints are also used quite extensively.



Rail-bending machines form part of the usual equipment of a track yard in Europe. The view at the left shows the rail bender at the Paris yards—The right-hand view shows the shelter housing the rail bender in the track yards of the Hamburg Street Railway. This shelter is directly in front of the company's large track storage house

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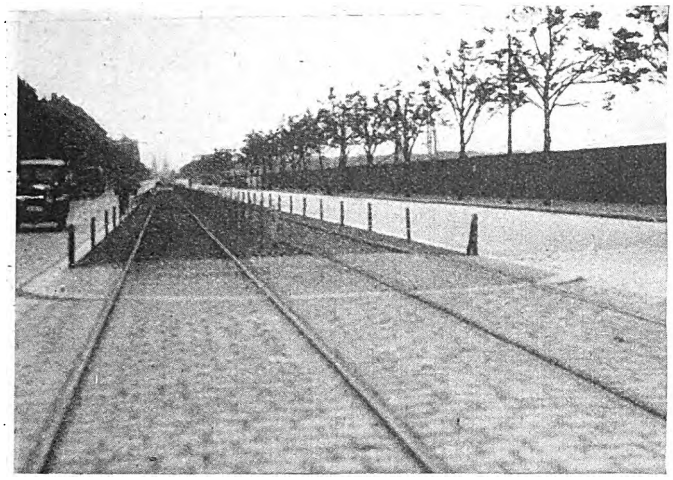
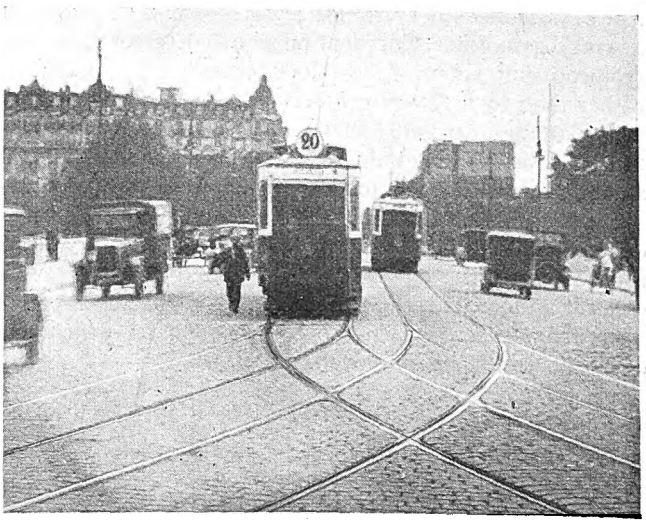


Track is often laid on reservations. The view at the left is from Berlin; that at the right from Dortmund

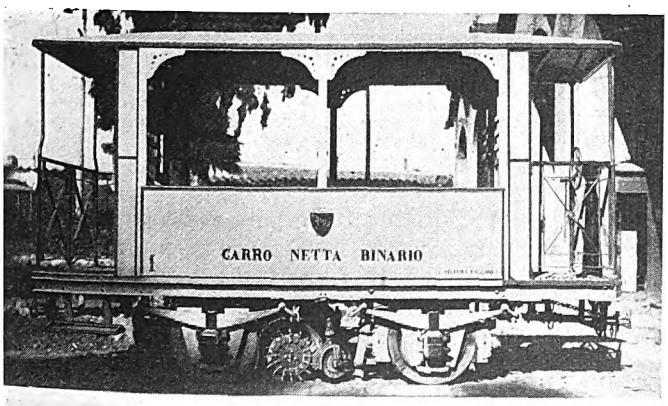
The groove in the rail is narrower than is customary in the United States, as will be seen from the sections reproduced. In fact, the groove in the rail is so narrow that it is not self-cleaning through the action of the car wheels, like most of the American grooved sections. Instead it has to be kept clean by track men who remove the dirt by an especially shaped shovel which they push before them, or by a digger which is carried on a car. Some companies have cars especially equipped for the purpose of keeping the head of the rail clean. Such a car, used on the Rome Municipal Tramways, is illustrated. It not only scrapes the dirt out of the groove in the rail and brushes it aside but it flushes the head of the rail with water from a reservoir carried on the car.

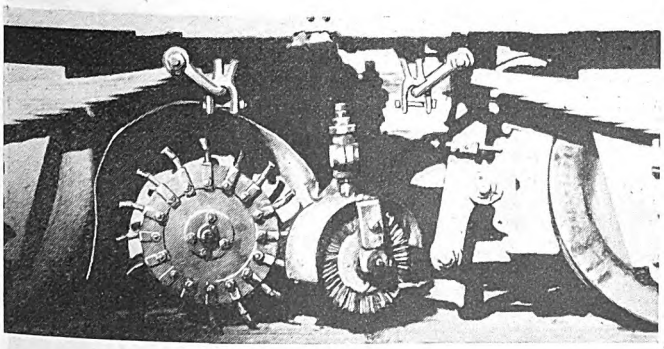
The continued use of a narrow groove on European tramways seems to be largely the fault of the city authorities. When narrow-tired horse-drawn vehicles were used, such a narrow groove may have been necessary to some extent. With automobiles now so general, there seems to be no reason against the use of a flaring groove.

Alloy rail for places of great wear is used more generally than here, as on curves of short radius. More attention is given to the drainage of track, particularly of the track groove. It is almost universal to use groove

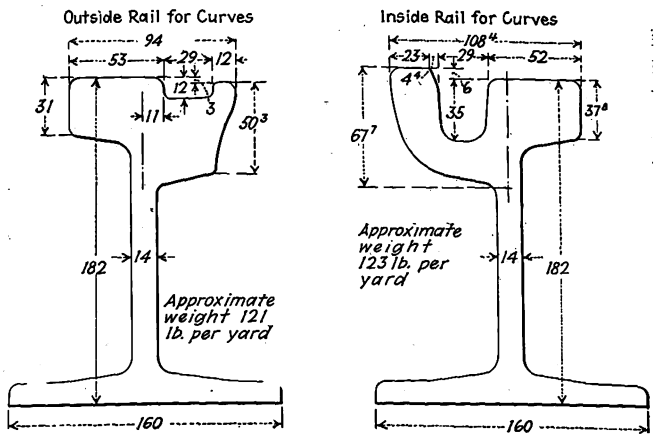


Paris is noted for its excellent special trackwork construction in paved streets





A work car cleans out the track groove and brushes the dirt away on the Rome Municipal Tramways. It also flushes the track. The upper view shows the complete car, the lower view shows the digging tool and rotary brush on a large scale



The outside rails on Paris curves up to 90 ft. radius use a shallow groove

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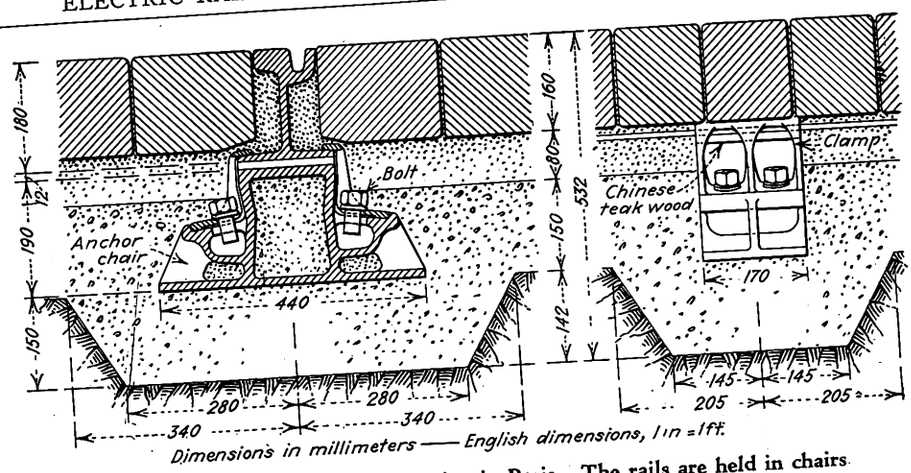
drainage. The maintenance of track as a whole is better in Europe than in America. This is a noticeable factor in reducing the noise of car operation.

At least as much attention is given in Europe to the use of track machinery in the construction and rehabilitation of track. Thus, a great many of the larger electric railway companies have power rail-bending machines, which are built in a variety of patterns in Germany and England. With the English bending machine used in Rome, two men can bend a rail in fifteen minutes. Rails can be bent on this machine to a radius of 40½ ft. The use of rail machinery is not always extended, however, to track grinding. Corrugation is often removed by the reciprocating action of a block operated by two men rather than by a rotary grinder.



Section of standard track construction in Paris. The rails are held in chairs embedded in concrete

An attempt to give details of the varieties of street railway track in Europe would require as much space as a similar article on track construction in this country. Instead an account will be given of the methods of track construction on the Paris overhead trolley lines. Within the center of the city these lines use the underground conduit system with the rails on yokes. The accompanying particulars relate to the construction on which the overhead trolley is employed.

Track Construction in Paris

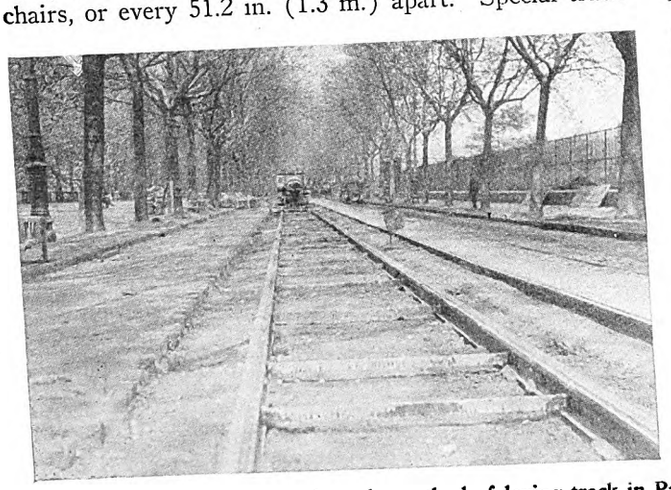
The standard rail of the Paris surface lines is 7.1 in. (180 mm.) high, weighs 104 lb. to the yard (52 kg. to the meter) and rests on cast iron chairs embedded in concrete. These chairs weigh 54½ lb. (24.8 kg.) each and are spaced 51.2 in. (1.3 m.) apart except at the joints where they are closer together. Between the base of the rail and the top of the chair is a flat piece of Chinese teakwood ½ in. (12 mm.) thick, to give resiliency to the track. The chair has a base 17 3/16 in. wide, or at right angles to the rail and 6 9/16 in. in the direction of the rail. Its shape is such that it is held firmly into the concrete to which it transmits its load. It holds the rail by two clamps with lock nuts on each side. No ties are used, but tie rods are installed midway between the chairs, or every 51.2 in. (1.3 m.) apart. Special trackwork is supported on chairs like straight track. These chairs are of the same height and similar in design to those used elsewhere but of a special shape to fit the base of the switch, mate or other part supported.

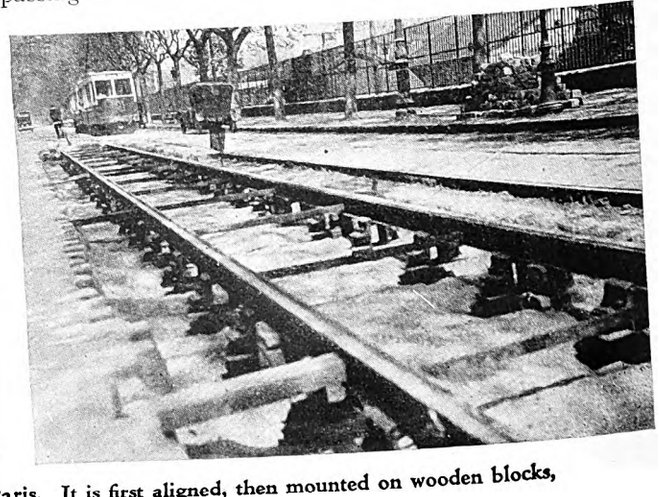
Manganese rail is used for the inside rail of all curves of less than 93 ft. (30 m.) radius. It is purchased in lengths of 5 m., 7 m., or 10 m. and is bent to shape in the company's track yards. A feature of curve construction in Paris is the use of a shallow groove for the outside rail of sharp radius curves. Its purpose is to allow the outside wheels of all cars to run on their flanges while passing around the curve so as to reduce grinding be-

TABLE II—LIST OF MATERIAL FOR 100 M. (328 FT.) OF SINGLE TRACK ON CHAIRS IN PARIS

Number in Wood Paving	Number in Stone Block Paving	Designation	Material	Unit Weight Kilograms	Unit Weight Pounds
200m.	200m.	Rail for straight track.	Rolled steel..	52.000*	104.0†
80	40	Tie rods.....	Rolled steel..	11.400	25.1
960	800	Bolt.....	Soft steel....	0.500	1.1
960	800	Lock nut.....	Spring steel..	0.070	0.15
160	160	Chair.....	Cast iron....	20.000	54.6
320	320	Clamp.....	Cast steel....	2.000	4.4
160	160	Wooden plate.....	Teak.....	0.270	0.59
1	1	Cross bond between rails.....	Copper.....	1.965	4.3
1	1	Cross bond between tracks.....	Copper.....	1.300	2.9
		For bolted joints			
11	11	Outside plate.....	Rolled steel..	45	99
11	11	Inside plate.....	Rolled steel..	a pair	a pair
90	90	Bolt.....	Soft steel....	0.670	1.47
22	22	Rail bond.....	Copper.....	1.500	3.3
		For welded joints			
11	11	Portion of thermit....	.....	.....	.....

* Kilograms per meter. † Pounds per yard.





These two views show the method of laying track in Paris. It is first aligned, then mounted on wooden blocks, then the concrete is poured

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tween the wheel flange and rail groove. Otherwise, the grinding would be considerable as most Paris cars are mounted on four 31½-in. wheels with a wheelbase of 11 ft. 10 in. This long wheelbase was adopted to reduce car nosing.

Besides its use of curves, manganese rail is standard for practically all crossings, switches and other special trackwork, and the throats of all such frogs are flange bearing. This practice undoubtedly has contributed greatly to noise reduction.

Other alloy steels, such as chrome steel and nickel steel, are also being tested for this purpose. The experience at the time of the visit of the writer to the property last summer was that manganese steel was more satisfactory, except that the other alloy rails had the advantage that thermit welds could be made to them more easily.

It will be noticed from all the Paris rail sections published that the head of the rail is absolutely flat. The treads of the wheels are also flat so that they have a bearing surface over the entire head of the rail. This design was adopted partly for the purpose of reducing rail corrugation and partly to reduce car nosing, which is thought to be greater where coned wheels are used.

Several photo engravings accompanying this article show the method of building track in Paris. It is not constructed from the bottom up but from the top down. After the trench has been dug, the track is laid in place with the chairs and tie rods attached. The track is then aligned and raised to position on wooden blocks. The final operation is to pour the concrete and then to lay the paving.

The cost of this construction without crossings or other special trackwork is approximately 300,000 fr. per kilometer ($19,200 per mile) of single track.

Novel Color Advertising Featured

MUCH of the advertising literature of the Pittsburgh Railways, Pittsburgh, Pa., is unusual, particularly with respect to the use of color and also the advantages derived from seasonal subjects. The text matter of one campaign was confined mainly to accident prevention, the weekly pass sale and a series of sixteen traffic talks as issued by the Better Traffic Committee. The first talk, which was released coincident with the opening of the public schools, warned Pittsburgh citizens of the no-parking rules, at the same time reminding them of the city's narrow streets and that there are about 120,000 automobiles in the community, with parking space for only about 5,000 cars. This talk was followed by a humorously illustrated reminder of how business is retarded by too much parking. Some of the other talks, which were issued weekly, are reproduced on this page.

The colored autumn leaf poster used in previous years was also presented, with an element of timeliness by calling attention to an accident on Sept. 8 which resulted from the street and track having become dangerous due to their leafy coating. Another effective use of multi-

IT'S THE CAREFUL DRIVER WHO IS WRECK-LESS

Some examples of publicity with which the Pittsburgh Railways is striving to put across the message of safety and service

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color may be seen in the accompanying illustration where a comical bird is employed to put across the economy resulting from the use of the weekly pass. Perhaps the most interesting of the color ads is one which is a reproduction of the old-time school slate, which not only

Types of posters in color used by the Pittsburgh Railways

stresses the Sunday pass selling argument but maintains humor and brings back memories to the older residents of the city.

A very effective poster in black and white gives a list of the number of accidents per carhouse in terms of car-miles operated, settlement and verdict, cost per hundred car-miles and accidents per 10,000 miles operated. The poster shows an auto caught by a street car and a telegraph pole on a dangerous curve. Referring again to the use of color, there was an interesting poster done in orange and red illustrated by a grotesque figure in black standing before a microphone. This was used to put over the radio show held at Duquesne Garden from Oct. 3 to 8. Another very effective poster showed a green cab and car drawn up side by side, the motorman and chauffeur grinning at each other. Underneath the text is as follows:

To Our Friends—the Motormen and Conductors: The traffic problem is our mutual one. The public safety on our streets and avenues is of constant and immediate concern to us all. By co-operation much can be done to solve this vital and important question. Green Cab is ready and willing to consider any way to help. We want to know how Green Cab men and the railway's men can work together for the public welfare. Suggestions from motormen and conductors on this matter will be welcomed by us.

This poster is signed, "Green Cab," below which is the slogan, "Let's all help the taxicab boys."

Although concerned with the distribution of larger posters, the Pittsburgh Railways has not neglected the little window pasters, some of which put over various problems in a few words; for instance:

Our present streets should be used for moving vehicles only. The parked car congests.

School opens this week. Please be careful of kiddies in the streets.

If every one would obey signals streets will be safer and all of us happier.

In addition to these forms of advertising the company still continues its policy of exhaustive publicity through the medium of the *Transit Guest,* the make-up of which is familiar to most of the readers of ELECTRIC RAILWAY JOURNAL.

Use of Maps Improves Service

STREET railway and interurban lines can add to their service to the public and increase the number of car riders, by a display of system maps in all cars and in terminals, according to an article in the Public Utilities Advertising Association *Bulletin* for February. Nearly all cities carry a transient population daily and house a portion of inhabitants who are familiar with not more than a fraction of the routes of their railway system. A better knowledge of the entire system, localities reached, points of general interest and educational institutions easy of access by trolley will increase car riders.

Wide adoption of one-man car operation has made it less convenient and desirable to interrupt the car operator. A complete map attached to the car window for ready reference will help patrons to answer many of their own questions by referring to the map. Such maps naturally should be designed to display street names clearly, designate car routes by number and bring out interesting points, of a nature to attract the public, in a graphic manner.

The use of car window maps is not altogether new. The Hudson Tunnel trains, joining New York City and New Jersey, carried maps for many years, attached to the center door of each car. Today each of the thousands of cars in the New York subways carries a map of the entire system. They have proved of widespread reference use.

In addition to car window maps, some companies distribute system maps in folded form and spread them widely in the thought that familiarity with the system is the first step in attracting traffic.

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Manufacture Transportation That Will Sell

By E. G. Buckland
Vice-President and General Counsel
New York, New Haven & Hartford Railroad

Nations rise and fall as their transportation is good or bad. The only thing to do is to produce transportation of a kind that the people will buy at a price that will pay, said the author, speaking before the New England Street Railway Club at its Springfield meeting March 22

MANUFACTURING of transportation is no different than manufacturing of any other commodity necessary to the prosperity of a community. It may be that transportation is in a measure more essential to the prosperity of a community than any other one article which industry may make in that community. But the economics which govern it are identical. In the case of a street railway, it is the manufacture of passenger-miles that will sell. You cannot manufacture any commodity economically with obsolete, worn-out, extravagant machinery. Therefore, the only thing to do, where you find that more power is being used in moving a car than should be used, is to look to the bonding of your tracks, to look to the character of the construction of your tracks, to look to the weight of your cars, to see that your transmission lines are right, to see that your generating station is right. That is common sense, applied to any other industry, and it is common sense when applied to railroading.

Now, the New Haven Railroad happened to be very largely interested in street railways. And the job which was up to us to work out was to see if we could produce a kind of transportation that people would buy at a price at which we could sell it. There was nothing more complicated than that. There is, however, one thing which enters into that question of transportation which perhaps does not occur to the layman, but certainly is in the minds of most of you as representatives of street railways. And that is, the kind of transportation that people will buy.

Four Principal Means of Transportation

I think we can say without fear of successful contradiction, that of the four principal kinds of transportation, that by water has its place as perhaps the cheapest kind of transportation to perform. The cheapest method of transporting masses of property overland is by the standard steam railroad. Now we have motor trucks and we have all sorts of other kinds of vehicles operating on the highways. All told they do not carry 5 per cent of the traffic. I wish sometimes that they would be required to carry the same degree of low-class traffic that we have to, but they apparently can pick and choose, and therefore take only the best. But in the matter of tonnage they do not carry more than 5 per cent of the traffic. I think, therefore, we can say safely that water transportation between ports is the cheapest, but that overland transportation by rail is most economical and will prevail.

What is the place of the street railway? At the inception of our negotiations with the cities of Worcester and Springfield, Mayor O'Hara and Mayor Parker were good enough to appoint in each of their cities experts to study, along with our representatives, the characteristics of the street railway transportation carried on in these two communities. And it is curious how closely together those reports were in their recommendations. And it is also interesting that the reports were unanimous in both cities and in both places. They came to the conclusion that in cities of the character and size of Springfield and of Worcester, where large numbers of people had to be handled in peak hours in the densely traveled portions of the cities, there was no other means of transportation so economical of space and so satisfactory, as to speed and facility, as the street railway. When we come to operation between cities we get into a twilight zone. As the density of the traffic decreases the profitable or economic character of the street railway car likewise decreases. When, added to that, by reason of the magnificent highways which the state of Massachusetts has constructed, a means of speedy communication is afforded, we have found that we can do better by substituting passenger motor buses from the perimeter of the densely-settled portions of the community, operating express from the center of the city to that perimeter and locally beyond that.

Now, that is simply a common sense co-ordination of traffic, which we believe will work and which has the advantage, I believe, of giving to people the kind of transportation which they wish to use. And it is difficult to sell to a man a thing which he does not want.

While I am on that subject, the question has been frequently asked: If you agree that the street railway has its place, as you have stated, that the passenger motor bus has its place, that the railroad and the steamboat have their places as stated, why not the motor truck? Why should you stop arbitrarily and not carry property over the highway, just as you do carry passengers over the highway?

The answer is that we are stopped by artificial statutory enactment in the interstate commerce act. Sections 2 and 3 of this act forbid unjust or unreasonable discrimination between persons or places, and the Interstate

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Commerce Commission has several times decided that a carrier subject to that act has no right to make a different rate in a locality, or to two persons in that locality engaged in the same kind of business. I am measuring my language here pretty carefully. The railroad has no right to make a different rate to one man than to another located in the same community, and doing the same kind of business.

If the railroad were to engage in the motor truck business, it would speedily find itself in this position, of continuing to give free delivery on a siding to an industry which had for a long time been established on that railroad siding, and charging an industry located a mile or so off the railroad for that transportation. And so long as it was engaged in motor trucking, there is nothing that the railroad could do to escape the imputation and the prohibition of unjust and unreasonable prejudice in charging the man located off its line for the motor truck haul.

Now, gentlemen, a few years ago we made an intensive study of the cost of trucking to and from our stations, and yards along our line, and we found that the amount which was paid was equal to the entire revenue which the company received for the carrying of the freight. If we were compelled to absorb motor truck charges we would probably go broke in 60 days. And that is the whole reason why you do not find the degree of willingness on the part of common carriers to engage in motor trucking that you find to engage in the carriage of passengers.

I am tempted at this point, because my subject is a pretty broad one—"The Co-ordination of Transportation in New England"—to say a few words to you who represent the producers of transportation, with respect to the character of the business in which you are engaged. I do not know whether you have ever really realized the importance of transportation in civilization. The great Francis Bacon once wrote this sentence: "There be but three things which make a country great and prosperous; a fertile soil, busy workshops, and easy conveyances for men and things from one place to another."

Whether he wrote Shakespeare or not, he uttered a great truth in that statement. There has never been a nation in the history of civilization that has risen to power that did not carry with it adequate means of transportation. I think we are entitled to accept the origin of transportation in Mesopotamia and in Egypt, which was the caravan route between the Red Sea, the Arabian Sea, and the Mediterranean. It is characteristic that this transportation followed the lines of transportation to Phoenicia, which controlled the Mediterranean. It was the envy of Israelites by reason of the magnificence of its commerce, that had spread to Carthage, which was a Phoenician outlying point, and remained in control of Carthage until Rome, in the three Punic Wars, wrested the control, and of the million population of Carthage only a few thousand were left. It was the outstanding characteristic of the Roman Empire, stretching from Jerusalem to the walls of Antioch, with a great stream of transportation which made it possible for the Roman citizen to go the entire length of the Roman Empire with the products of the Roman territory. Later, Venice came to the fore, when she controlled the transportation of the seas, and traded with Constantinople, Greece, Syria and Egypt. Her prosperity increased and far surpassed that of the first Venice. Until she lost her transportation power the Roman Empire had prospered. Spain succeeded, and if she had been as willing to colonize as she was to conquer might have maintained her prestige today. But she ran against England, who was destined to colonize in conquering, and the Armada destroyed Spain's power because it took from her the means of transportation and gave it to the British Empire, which has maintained it ever since.

Are you interested in the solution of traffic problems?

Then read the

DETROIT TRAFFIC SURVEY

digest, the first section of which will appear in next week's issue.

Here in the United States we have grown up with transportation. The thirteen original states, the real fringe along the Atlantic seaboard, measured the extent to which the sailing ship, and the rowboat, and the ox wagon went, and it so happened that almost at the beginning of these United States of ours occurred the beginning of new methods of transportation. We became a nation in 1787. Within twenty years the steamboat was invented; within twenty more years the steam locomotive was invented; within 25 more years the telegraph was invented; in twenty more years the telephone was invented; all means of conveying persons and property in commerce, and the transmission of intelligence in commerce.

We, here in the United States, have grown hand in hand with the development in our transportation; in the intermingling of people, in the exchange of ideas, in the exchange of property, all of which are essentials to the progress of a nation. If you do not believe it in modern times, just compare two countries, the United States and Russia. They are not very different in area; Russia is somewhat larger. They are not very different in the breadth of latitude which they occupy. We have 262,000 miles of railroad; Russia has 25,000 miles of railroad. Can anyone doubt that if 100 years ago, when Peter the Great was teaching the greatness to which Russia was destined, he had educated his people and built 260,000 miles of railroads, ramifying through that great empire, that Russia today would have a great asset for national prosperity, instead of being a blot upon the nations of the world?

So you who are engaged in this great industry of transportation need never apologize for it. It is one on which I believe the prosperity of the world depends, and I am in good company when I predict that the peace of the world may depend on it; for it was only the day before yesterday when that splendid Lone Eagle, who winged his way alone from New York to Paris, and afterward as the Ambassador of Good Will to the countries about the Caribbean, said that the differences which existed between those countries existed because it took days and weeks to go through the jungles and over the mountains, but that by air that distance could be traversed in two or three or four hours, and these people be brought into contact, each with the other, so that these

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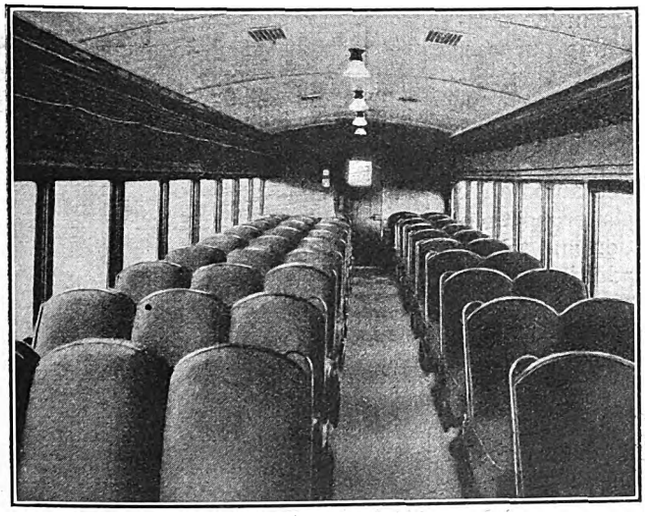
jungles of doubt and mountains of ignorance might be levelled, and be brought to a common understanding.

It is that which gives us as transportation men the vision which Tennyson gave us so many years ago in Locksley Hall, when he spoke of the time when "the war drum throbb'd no longer, and the battle flags were furl'd in the Parliament of Man, and the Federation of the World."

Winnipeg Company Uses Gas-Electric Car



The interior of the gas-electric car is roomy and comfortable

RAPIDLY increasing traffic on the Winnipeg River Railway due to pulp, wood and mining activity in central Manitoba made necessary recently the installation of a Mack model AS gas-electric car by the Winnipeg Electric Company.

The car is 52 ft. long, 10 ft. wide and over 12 ft. high. It weighs 30 tons and carries 59 passengers. The car is of aluminum construction throughout, contains a parlor car section, smoking compartment, express room and the usual conveniences found on standard main-line trains. It has a rating of 120 hp. From the viewpoints of comfort and utility, the car has proved highly satisfactory. Well-cushioned spring seats absorb all road shocks.

Witness Blank Tells of Bonus

ACCIDENT PREVENTION BONUS

The conductor and motorman of this car are paid a bonus for safe operation, which they lose if involved in a preventable accident.

The management and employees take pride in an exceptional record for safe operation—and solicit your cooperation.

Your name and address on this card will assist the company in giving fair treatment to all concerned.

Name .....

Residence .....

Telephone Number .....

City .....

Business Address .....

Telephone Number .....

City .....

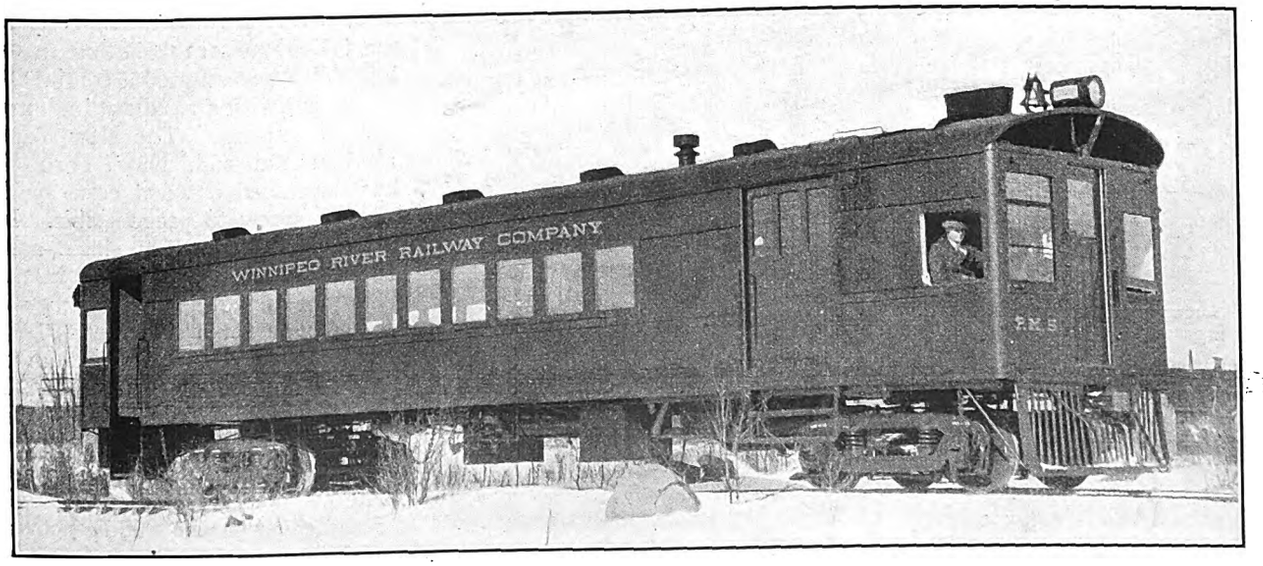
DATE ..... **THANK YOU**

Brooklyn witness card tells of bonus plan

SINCE the introduction of the bonus system for excellence of accident records, conductors and motormen of the Brooklyn City Railroad, Brooklyn, N. Y., have been turning in the names of more witnesses than they did previously. In order to assist them still more, a new form of witness card has been made out which tells the witness of the participation of motormen and conductors in the bonus for safe operation. It is believed that with the use of this card, the accident records will continue to improve.

More Light for Chicago Readers

ELECTRIC lamps with clear glass which have been standard in the cars of the Chicago Surface Lines, Chicago, Ill., rated at 23 watts, are being replaced by 36-watt lamps, with inside frosting. This change was determined upon after an extensive investigation. These new lights will provide 40 per cent more illumination, making it much easier for passengers to read newspapers. Additional energy required for these lights will amount to about $25,000 a year.



This gas-electric car is handling passenger traffic on an outlying line of the Winnipeg Electric Company's system

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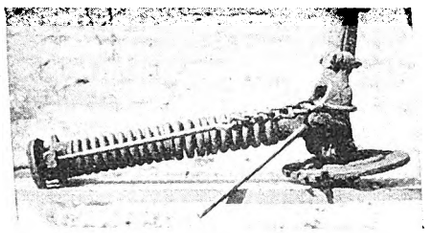
Maintenance Methods *and* Devices

Emergency Trolley Tension Rod



This trolley base tension rod is a time saver when the regular rod breaks

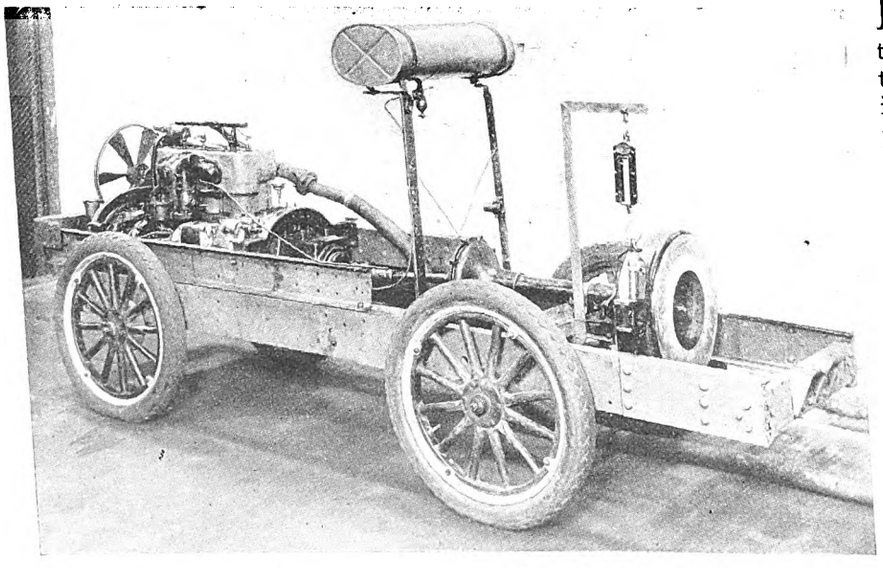
PROPER trolley pole pressure is easily obtained in the event of a broken rod with the trolley base tension rod shown in the illustration. It was developed by one of the trouble men of the Cincinnati Street Railway, Cincinnati, Ohio. This rod may be attached to the trolley base without driving out the pin that holds the end of the broken rod in place. As a result this tension rod has been found a very effective time saver for emergency jobs of the nature described.

Portable Dynamometer Set for "Running-In" Motors

IT IS BELIEVED by the bus maintenance department of the Milwaukee Electric Railway & Light Company, Milwaukee, Wis., that the bearings of automotive engines which have had their periodic or emergency overhauling completed, are best run in with a portable prony brake dynamometer.

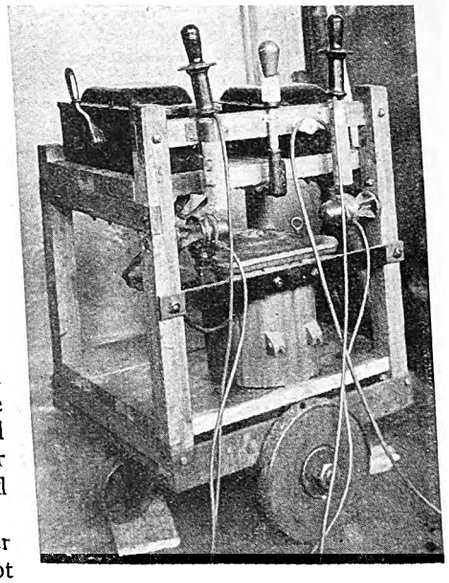
The truck assembly of dynamometer equipment shown in the accompanying illustration was made in the company's shop to answer this purpose. It consists essentially of a deep channel side frame bolted together with end pieces of almost equal depth to form a rigid chassis. This is mounted on ordinary light-weight automotive type axles, with wheels proportionately of light construction and taking 30x3½-in. tires. An additional steel frame is mounted at one end of the chassis with cross members so spaced as to permit the mounting of either four or six-cylinder motors as used with the bus equipment.

It has been found that proper "running-in" of motor bearings is not insured simply by operating such a motor at an idling speed over a period of twelve to eighteen hours. The prony brake is used, therefore, to load the engine progressively over a period of twelve hours until during the last one to one and one-half hours or so, it is carrying as nearly normal full load as can be approximated. The first two hours of the "running-in" process is at no load, the next eight hours a load of about 33 per cent of normal full load is held, and the finish is with the engine operating at its rated horsepower.



This portable prony brake dynamometer was made in the Milwaukee Electric Railway & Light Company's own shops to solve the problem of properly "running-in" bus motors

High Tension Test Outfit



SINCE publication of the article by R. S. Beers on a simple high-potential testing outfit in the JOURNAL for March 24, page 505, a photograph of the actual device has been received. This is reproduced herewith. The basis of the outfit is a standard 110/2,200-volt lighting transformer. The auxiliary equipment and the testing leads are also shown.

Wood Commutator Cover with Added Features

FAILURE to latch properly often caused the malleable iron commutator covers furnished originally with the GE-80 motors to be lost in service. This necessitated a continual replacement with a resultant high maintenance expense. The New York & Harlem Railroad, New York City, has developed a wood cover with a locking screw to prevent this. It is made of oak, oval in shape and is 19½ in. long, 9 in. wide and 1 in. thick. One-half of the thickness of the wood is cut away for a distance of $1\frac{5}{16}$ in. from the edge. This leaves an oval boss $16\frac{7}{8}$ in. long by $6\frac{3}{8}$ in. wide. The boss fits into the commutator hole of the motor frame and prevents shifting of the cover. A ⅛x4-in. steel plate installed across the entire width of the cover at the middle acts as a reinforcement as well as a footing for the holding screw. The holding

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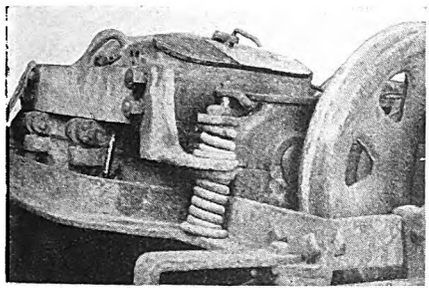


Wooden commutator cover takes place of lost ones

screw support is a malleable casting and is bolted to the top half of the motor shell. This casting projects over the plate for about 3 in., and the end is drilled and tapped with ½-in. machine threads.

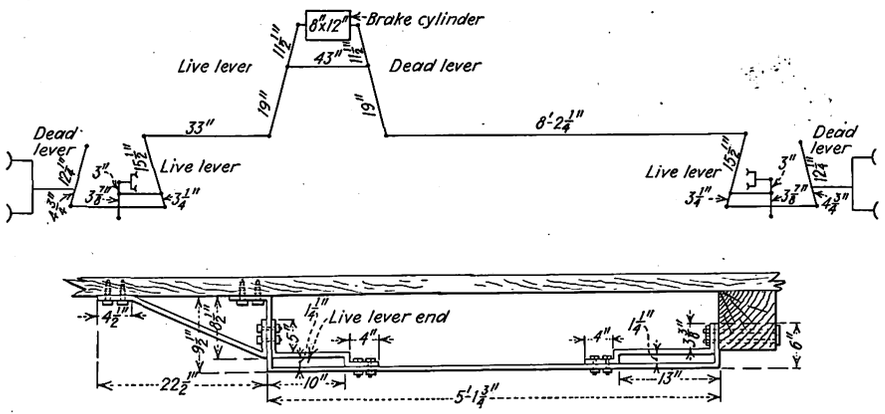
The holding screw is made from ½-in. round bar. It is bent at a right angle with a short end of 2½ in. and a long side of 4½ in. The short end is threaded for installation in the support and the long side is used as the handle. This cover is light, and since the locking handle is within easy reach of the workman no difficulty has been experienced in keeping it on at all times.

Portable Vacuum Cleaner for Car Seats

PLUSH and cane seats in the cars of the Atlantic City & Shore Railroad, Atlantic City, N. J., are cleaned at regular intervals by means of an Electro-Lux vacuum cleaner. This is a small portable equipment operating on 110 volts alternating current. Convenient outlets at this voltage are located at intervals through the car shops. The process takes about 4½ hours per car, including removal of dust and dirt from the floor around the seat supports, and from the arm rests and window sills, as well as from the seats themselves. A thorough cleaning is given to each car once every two weeks.

Safety Stop for Brake Cylinder Levers

SAFETY and continuity of service being considered of importance on the New York & Queens County Railway, Woodside, N. Y., nothing is overlooked that will tend to improve these factors. To guard against a total loss of the braking power if one of the pull rods breaks led to the design of a stop which would assure one-half of the braking effort. This was accomplished in the following manner: A flat bar ½ in. x 3 in. x 66¾ in. is installed in such a position that it supports the ends of the brake cylinder live and dead lever in a horizontal position. One end of this carrier is fastened to a cross sill by ½-in. through bolts and the other end is secured to the center sill by ½-in. lagscrews. A piece of ½-in. x 3-in. iron is bolted to the carrier over each lever so that it forms a slot 10 in. long for the live lever and 13 in. long for the dead lever. These slots allow free movement of the levers under normal operating conditions, and with a broken pull rod act as a stop for the loose lever. This permits the proper functioning of the complete braking equipment fastened to the other lever.



Arrangement of safety stops for brake levers

Twenty Things to Avoid in Maintaining Cable Leads

1. *Cutting of wire strands when removing cable insulation.*
2. *Making a terminal connection with ends of strands twisted.*
3. *Removal of too little insulation so that only one setscrew takes hold of the cable.*
4. *Terminal and connector setscrews not locked with jam nuts and lock washers.*
5. *Soldering of cable ends by inexperienced men.*
6. *Poor cleaning of conductors preparatory to soldering.*
7. *Solder that is too cold.*
8. *Soldering acid that is too weak.*
9. *Rough soldered joints with poor insulation.*
10. *Solder spattered over face of commutator and necks at armature connections.*
11. *Acid flux spilled on armature windings.*
12. *Poor insulation of field coil terminals after making cable connections.*
13. *Iron setscrews dropped in motor frame and left there.*
14. *Poorly supported leads anchored inside motor frame.*
15. *Cable for motor leads and wiring around frame that is too stiff.*
16. *Reversed field coils from wrong cable connections.*
17. *Motor leads brought out of frame by non-uniform methods.*
18. *Insecure cleating to hold leads to motor frame and car body.*
19. *Leads arranged so they will rub on motor or car parts.*
20. *Knuckle joint connectors placed in the swinging loop.*

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New Equipment Available

Light-Weight Calculator

LESS than 7 lb. is the weight of a calculating machine announced by the Burroughs Adding Machine Company, Detroit, Mich. While small and compact it is equipped with full-size keys, a standard keyboard, visible adding dials and operates the same as the larger models. The machine is but 6½ in. wide and 11¼ in. long. It has an accumulating capacity

Small compact computing machine

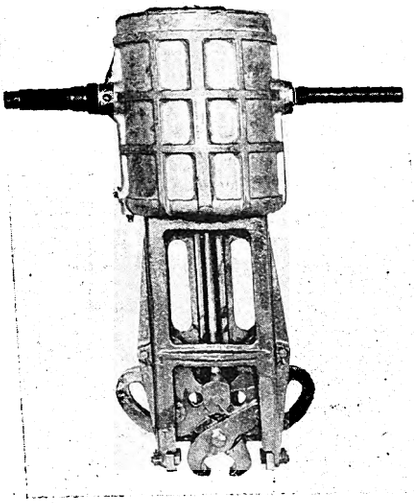
of 9,999.99 for addition and multiplication. Subtraction and division are facilitated by the proper complementary figures on all keytops.

The mechanism of the new calculator is adjusted to high-speed work. It was brought out primarily to meet the requirements of railways and public utilities for a low-priced machine for revenue accounting work, and for checking invoices and computing payrolls.

Air-Operated Spike Puller

SPIKE pulling is facilitated by a tool developed for the purpose by Ingersoll-Rand, New York, N. Y. It is claimed that with it one man can pull eight to ten spikes per minute. The machine is light, so that it can be moved quickly by hand from tie to tie. It is said to consume on the average only 3 cu.ft. of air per spike.

To pull a spike the throttle is turned to admit air on top of the plunger. As the plunger moves down a link arrangement opens the jaws on the lower end. The machine is then set with the jaws around the spike and the foot-rest on the lower flange of the rail. Air is admitted by rotating the throttle and the plunger rises. The pull from the



Air-operated spike puller

plunger moves the links to close the jaws under the head of the spike and clamp it firmly. As soon as the jaws clamp a strong upward pull draws out the spike.

Hydraulic Jack Used for Pressing In Bushings

HEREWITH is shown a Blackhawk hydraulic jack of 7-ton capacity installed so as to act as a horizontal press. All hydraulic jacks of the Blackhawk Manufacturing Company, Milwaukee, Wis., operate horizontally providing the pump side is down. To help speed up production a spring is fastened to the base of the jack and to the side of the ram. When the release valve is opened this spring pulls the head of the jack off the finished job, and allows removal of the piece and the placing of a new shaft and collar.

Method of using hydraulic jack as a horizontal press

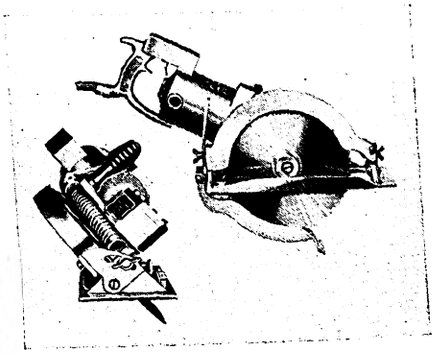
Manganese Steel Drilled Successfully

IT HAS always been considered impracticable to drill or machine high manganese steel. With the advent of a new cobalt steel, however, the Morse Twist Drill & Machine Company, New Bedford, Mass., announces that it has been able successfully to drill railroad frogs with a chemical content of 1.08 carbon, 10.04 manganese, and with a Brinell hardness of 207-217, using a drill of special structure to withstand extreme torque and point pressure.

On one grind nine holes each 1½ in. deep were drilled through the railroad frog. The company announces that it is now prepared to make drills for this work upon specification.

Portable Electric Hand Saw

BEVEL sawing, at any angle up to 60 deg., in addition to vertical sawing is announced as a feature of a new hand saw produced by the Wodack Electric Tool Corporation, Chicago, Ill. The new type B portable electric hand saw has a tilting



New type portable electric hand saw

base which can be set and locked at any angle within the 60 deg. range, by means of a slide and locknut.

Another new feature is that of the width gage for vertical sawing, which can be set for any dimension up to 6 in. With it various widths of strips can be sawed without the necessity of marking.

Like other Wodack saws the type B has a built-in General Electric universal motor which operates on both alternating and direct current. Each saw is furnished complete with a one 11 in. and one 9 in. blade.

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Association Activities

Utilities Problems Discussed at Baltimore Meeting

Beneficial results to be accomplished formed the theme of the principal speakers at the sixth annual convention of the Maryland Utilities Association held in Baltimore, Md., last week

WITH ADDRESSES by nationally known experts in their particular fields, the Maryland Utilities Association held its sixth annual convention at the Emerson Hotel, Baltimore, Md., Friday, March 23, 1928. In order to promote liberal discussion of the various problems, the morning session was divided into four groups, electric, transportation, gas and water. In the transportation group Dean J. Locke, staff engineer United Railways & Electric Company of Baltimore, told of traffic conditions and various schemes of traffic control used in Chicago, Cleveland, Detroit, Pittsburgh and Baltimore. An abstract of his paper is published elsewhere in this issue.

In the discussion following Mr. Locke's paper, C. D. Gaither, police commissioner of Baltimore, told of some of the problems that were confronting the police department and of various remedies that were being tried to solve them. Carl W. Stocks, editor *Bus Transportation*, spoke briefly of the desirability for uniformity in traffic regulation, and Clarence W. Squier, associate editor ELECTRIC RAILWAY JOURNAL, spoke of the reduction in accidents that could be expected from improved traffic control and the advantages of safety zones and wide left turns in speeding up the movement of traffic in city streets.

The electric group discussed various committee reports and listened to a paper by Earl Whitehorne, commercial editor of *Electrical World*, on developing domestic loads. The gas group heard about care and maintenance of the gas meter by A. M. Wolfe, assistant manager Maryland Meter Works, and the water group had a general discussion on their problems.

The afternoon joint session was taken up largely by three addresses by prominent officials of the American Electric Railway Association, the American Gas Association and the National Electric Light Association. In comparing electric railways with other public utilities, L. S. Storrs, managing director American Electric Railway Association, commented on the size of the electric railway industry and by various comparisons showed its real importance and that, in fact, it must be considered as one of the greatest factors affecting the growth and prosperity of any community. Without transportation, he said, development would lag badly. An abstract of Mr. Storrs' address is given below.

Major Alexander Forward, managing director American Gas Association, prophesied the ultimate elimination of smoke and spoke of some of the things that he believes could be expected in the future for gas producers. He gave some statistics to show the trend toward consolidation of industry. Interstate power was discussed by Major H. S. Bennion, director of engineering National Electric Light Association.

In the business session of the association, the following officers were elected: President, H. T. Connolly, general manager Washington, Baltimore & Annapolis Railroad, Baltimore, Md.; vice-president, H. A. Brooks, Potomac Electric Power Company, Washington, D. C.; treasurer, R. E. Town, Potomac Edison Company, Hagerstown, Md.; secretary, David Kinnear, United Railways & Electric Company of Baltimore. The directors chosen were Adrian Hughes, Jr., L. G. Smith, C. H. Leatham, Frank Meyers, Frank Mitchell, and G. W. Woolford.

The evening session included a banquet and addresses by Albert C. Ritchie, Governor of Maryland, and William F. Broening, Mayor of Baltimore.

Electric Railways Are Not Looking for Charity*

By LUCIUS S. STORRS
Managing Director American Electric Railway Association

IN RECENT years the electric railway branch of the public utility business has been regarded almost as a "poor relation." With $5,500,000,000 invested in it, with 300,000 men on its payrolls, and with its service to nearly 16,000,000,000 of passengers per annum, it still is a great enterprise. But lately the growth of the power and light business has been so spectacular, and the troubles of the electric railways due to the competition of the private automobile and the unregulated bus have been so prominently before the public, that the vitally necessary service which the electric railways are rendering to the public, and which they will continue to render, has been somewhat obscured.

But the electric railways are not "poor relations." They are by no means clamoring for charity. They *are* asking for better understanding, for better appreciation of the fact that they are rendering a service that cannot, by any stretch of imagination, be dispensed with; they *are* seeking the full co-operation of the public in the rendering of that service.

Electric railways *do* render an essential, absolutely necessary service. The reason why electric railway service is irreplaceable is that it is the most economical means of transporting the masses of the people. Nothing yet has been devised that is so efficient and inexpensive in carrying large numbers of people from their homes to the factories, to the shopping centers, to the theaters and other places where people must gather in large bodies.

The principal field for the electric railway is in the medium and large-size cities. It is inconceivable that a city like Baltimore could continue to be an attractive, prosperous metropolitan city without such excellent service as the local street railway gives the public.

Too often the question of rate of fare occupies the public mind, when the real problem is quality of service. Where can you buy for 5 cents anything that you could have bought for that sum ten or fifteen years ago, except possibly a postage stamp? Yet the 5-cent fare has been a political fetish in some of our large cities, notably in New York, where the inadequate revenues of the electric railways have prevented the development of the kind of service which the people really want, but which their political overseers have prevented them from getting.

It is gradually sinking into the public mind that something cannot be gotten from a street railway company for nothing any more than something can be taken from a grocery store without payment. You may force your public utility to continue to give you service at less than a fair rate of return, but

**Abstract of an address delivered before the Maryland Utilities Association, Baltimore, Md., March 23, 1928.*

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rest assured that that company cannot continue forever to give service under such a handicap and remain a sound business organization. Sooner or later the day of reckoning comes, and then you have receiverships, with the lopping off of non-paying lines, destruction of values, disruption of the business of the community and greater expense and inconvenience to the public.

Fares Should Give a Reasonable Rate of Return

If I had any plea to make, more than another, it would be for recognition of the right of the electric railways to earn a rate of return that would permit them to render the public the high quality of service which the public wants. The granting of that plea would insure the continuance of this necessary service with ever-increasing improvement. It would insure as ready a flow of capital into the electric railway industry—publicly regulated and controlled—as flows into private business enterprises, many of them by no means essential and all of them free from public regulation.

Granting of that plea would put quality and adequacy of service over everything else. It would make the rate of fare a matter of secondary importance, which it rightfully should be.

The first essential of any public service is *adequacy,* and as the service is publicly controlled it is within the power of the regulatory authorities to insist that it shall be adequate. But a company not earning its operating expenses, or at best a mere pittance above them, is in no position to give the public the kind of service it most earnestly wants to give and which the public desires and ought to have.

In some parts of the country, notably in Ohio, the service-at-cost franchise has solved the problem of adequacy of service and reasonable rate of return. This kind of franchise provides that a specified rate of return on the value of the property shall be counted as part of the cost of providing the service. The rate of fare fluctuates according to the condition of the operating surplus of the company. You probably are familiar with the franchises in Cincinnati and Cleveland, in which those large cities recognize a fair return on the value of the properties as a proper element of the cost of service.

I am not here advocating any particular kind of franchise, I cite these instances merely in support of my statement that the public is coming to recognize more fully the importance of permitting its street railway companies to charge rates of fare that will assure the investors a reasonable return on their money invested in the public service. The same result may be obtained under any franchise, provided the regulatory bodies, the public and the companies have mutual understanding of their obligations to each other, mutual confidence and respect and a common ideal—the provision and support of a truly adequate public transportation service.

Traffic and Traffic Control in Various Large Cities*

By Dean J. Locke,
Staff Engineer United Railways & Electric Company of Baltimore

OUR highway systems, designed for the most part many years ago to meet the then existing traffic conditions, are inadequate today. It is the purpose of this paper to describe briefly the traffic in a number of cities visited and make a comparison with Baltimore.

The visitor to Chicago is quickly impressed with the absence of congestion in street and pedestrian traffic within the downtown Loop district. Most of the streets are either 38 or 48 ft. between the curbs. Blocks are laid out in a rectangular pattern, and average 400 ft. north and south, and 320 ft. east and west.

The co-ordinated traffic light system now in use in the Loop district of Chicago has three objects in view: (1) to release traffic officers for better use in the promotion of safety and reduction of ordinance violations; (2) to speed up traffic, and (3) to increase the capacity of the streets. The system was a success from the start. It nearly doubled the speed of street cars and motor vehicles through the controlled district and increased the street capacity by from 25 to 50 per cent. Regulations on parking that became effective two years later, further materially increased street capacities. Records of the Police Department indicate a reduction of 23 per cent in the number of personal injuries from automobile accidents as a result of the signal control.

At the entrance of the controlled area the signals are set to admit traffic part of the time, and part of the time to permit traffic on the cross streets. This breaks the lines of vehicles into groups or platoons separated by an interval of time. As each group moves along the street toward the succeeding street intersection, the signals at that intersection are made to give an indication in their favor just as they arrive. The interval between the changes in lights at successive intersections is timed to permit steady movement under average conditions. The travel on cross streets flows in the interval between these groups and in a similar manner.

When the system was planned the data indicated that a 90-second cycle would be necessary. In practice traffic movements have been so facilitated that for normal weekdays six different lengths of cycle are now employed during the different periods of the day, ranging between 50 and 70 seconds. On Saturdays seven different cycle lengths are employed, as the traffic at times is materially different from that on other weekdays.

Shortly after the signals were placed in operation, parking within 50 ft. of the downtown signal lights was prohibited to promote better vision at the street intersection, to facilitate the loading of street cars and to minimize delays at congested street corners. At each stopping place at the near side of each intersection a car safety zone has been established. Free wheel vehicles are required to use the lane between the curb and the loading zone.

All left turns are prohibited at all intersections within the Loop except at the boundaries of the section.

On Jan. 10, 1928, parking in the Chicago Loop section was prohibited by ordinance during business hours. This "No Parking" ordinance affects an area of approximately 1 mile square. Within the past few days opponents of the plan have succeeded in securing an amendment to the ordinance permitting ten-minute parking of passenger automobiles within the Loop district.

With the parking ban as first instituted vehicles move with a saving in time of more than 20 per cent during the evening rush hours and of more than 30 per cent during the middle of the day. Pedestrians move more freely with a greater sense of security. Street car schedules are much more regular and save 15 per cent of passenger time. Cabs, buses, private and commercial cars operate as before, and passenger vehicles can stop to receive and discharge passengers as they always have done. All of these benefits have been obtained without limiting the use of the street to traffic in any way. It simply means that vehicles cannot block the streets by using them for storage.

Cleveland's Natural Advantages

Cleveland has about 225 traffic lights installed at the present time. The great majority of these are at isolated corners in outlying sections and work independently although controlled by the master timers of the groups to be described. There are, however, three groups of signals, working on the co-ordinated control plan, which handle traffic on heavy arteries in a most efficient manner.

The first group is that on Euclid Avenue between Public Square and Eighteenth Street, where, in the shopping district for a distance of about 4,000 ft. nine signals have been installed with control centered in a tower at Ninth Street, the busiest intersection.

The second group is that on Carnegie Avenue between 30th Street and Sterns Road, where 21 signals provide co-ordinated control of free-wheel vehicles for a distance of more than 3 miles. Carnegie Avenue is a main artery of travel. Traffic consists almost entirely of passenger cars and buses; slow-moving trucks are diverted to parallel streets. Cross traffic at the different in-

**Abstract of a paper presented before the Maryland Utilities Association, Baltimore, Md., March 23, 1928.*

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Essential Features to Successful Solution of Traffic Problems

1. Without genuine co-operation and unselfish contributions by the various interests involved, including the city administrators, the police, business organizations, transportation companies and the general public, the present-day traffic problems cannot be solved as they should be.

2. The immediate problem, apart from that of city planning, is concerned with means of securing the maximum efficiency in the use of existing streets and other traffic facilities.

3. Traffic control devices have passed the experimental stage, but they should be installed only after very careful engineering investigation and study into all the facts and conditions surrounding their use and when a definite need for them has been established. There is real danger that the widespread installation of signals at isolated intersections will result in great delay to traffic which will not be compensated for by added safety.

4. Automatic traffic control devices, when installed under proper conditions and operated properly, increase materially the capacity of streets, the speeds of vehicle operation and the safety of individuals using the streets.

5. Parking is the principal and least justifiable cause of street congestion. It is the crux of the traffic problem in most cities, including Baltimore. Parked cars cut our street widths in two, strangle business and delay all who use the streets, while only a few car owners are benefited.

6. Materially greater provision should be made for off-street storage of motor cars in the business district.

7. Where free wheel vehicles and street cars are in conflict, separate lanes of travel should be provided to permit the fluid movement of traffic. To this end, car stops generally throughout the business district should be provided with clearly defined safety or loading zones. Where street widths are too narrow to permit of clear free-wheel vehicle lanes opposite such zones, curbs should be recessed, where physically possible.

8. Boulevard stops, when carefully located, are a material aid to the relief of traffic congestion and to the promotion of safety.

tersections varies from a volume approximately equal to that on Carnegie Avenue, to a very small amount. The width of Carnegie Avenue permits four lanes of traffic. In the morning rush hour three lanes are occupied by inbound traffic and one by outbound, while in the evening rush hour three lanes are occupied by outbound traffic and one by inbound. The system is so adjusted with a cycle of 84 seconds that traffic at a speed of 25 m.p.h. can move in both directions without interruption. Motorists may now cover the controlled section in an average time of ten minutes, where formerly with manually operated semaphore control, 21 minutes were required.

The third installation is on Euclid Avenue in East Cleveland, where for a distance of more than 3 miles, sixteen intersections are co-ordinate-controlled from City Hall. There the roadway is 68 ft. in width. The 61-second cycle permits of an average vehicle speed through the section of about 24 m.p.h. and an average car speed of about 12 m.p.h., including stops. Elevated car loading platforms are used at each car stop.

The streets adjacent to the boundaries of the Loop district in Detroit are rectangular in pattern with widths of about 60 ft. between building lines. In the center, however, streets are in radial and circular pattern, with Grand Circus Park as a center. Some of the radial streets, including Woodward Avenue, are as much as 120 ft. wide. The street plan makes the control of traffic difficult.

Traffic on the principal streets is controlled by some 125 automatic signals, mounted in a variety of ways, hence somewhat confusing to users of the streets.

Practical Benefits in Doubt

The signals operate on a fixed 56-second cycle split equally between green and red. They are controlled from one timing mechanism. The light aspects are staggered to provide progressive movement of vehicles at about 20 m.p.h. With this arrangement the aspects down any one street at any given time are individually or in groups alternately green and red. While this plan when installed penalized traffic on the main thoroughfares while giving an unduly long interval to minor cross streets, it was supposed to speed up both motor and street car traffic some 60 per cent and to reduce the accidents very materially. There has, however, been some controversy as to its practical benefits and I understand that it is proposed to rearrange the signal timing mechanism to provide for co-ordinated control, as in Chicago and Cleveland. A trial installation of this type has been in successful operation for some time on Cass Avenue between Temple and Antoinette Streets.

Pittsburgh's Tough Problem

Undoubtedly Pittsburgh has one of the toughest traffic problems to solve of any large city in the United States. The business center, termed "the Triangle," lies in the fork of two rivers, and is surrounded by hills and precipices. The blocks are irregular and narrow. Practically two-thirds of the blocks are under 300 ft. in length. About half of them accommodate but two lanes of traffic. Most of the three-lane streets, comprising 40 per cent of the blocks, are one-way streets and have been such for a number of years.

At the present time traffic control in the Triangle is by officers using semaphore signals. Congestion is so great that vehicular speeds are very low and street capacities are decidedly limited. That these conditions are not worse is due in considerable measure to a no-parking ordinance which prohibits parking on a vast majority of the downtown streets either for 24 hours a day or between 8 a.m. and 6 p.m.

A solution of Pittsburgh's traffic problem is in sight, however, as the result of the untiring efforts of the Mayor's better traffic committee, which, appointed early in 1925, has made a comprehensive study of the problem and recently has submitted a report recommending: (1) The immediate installation of a "flexible co-ordinated" electric traffic control system in the central business district; (2) that steps be taken to bring about obedience to signals by pedestrian traffic as well as by the vehicular traffic; (3) that immediate consideration be given to the elimination of many of the left-hand turns; (4) that immediate consideration be given to the prohibition of horse-drawn traffic from certain major streets during the peak hours, with the setting up of certain suitable by-pass streets for this type of traffic.

It is proposed to install electric signals at some 100 downtown intersections at a cost of several hundred thousand dollars. These signals would be master-controlled at some convenient centralized point and would provide a means of increasing street capacities and the safety of movement. The studies made indicate a possible time saving for both motor vehicles and street cars in traversing the proposed signalized area of from 30 to 40 per cent.

Here in Baltimore we have a serious traffic problem. Within the central business district 66 per cent of the roadways are less than 40 ft. in width and 50 per cent of the blocks are less than 300 ft. long.

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At all but a few intersections downtown traffic control is by officers using semaphores or lights. No parking is permitted between 7:30 and 9:30 a.m. and between 4:30 and 6 p.m. on a limited number of streets, while two-hour parking is permitted generally between 9:30 a.m. and 4:30 p.m.

Outside the business district traffic is controlled at some 135 intersections by automatic lights, most of which are controlled individually. The exceptions are small groups on North Avenue, Mount Royal Avenue, the Fallsway and St. Paul Street, which are synchronously operated, and a group of twelve lights on Cathedral Street, which recently have been connected with a more modern co-ordinated type of control. The Cathedral Street group permits continuous flow of automobile traffic for a distance of 4,200 ft. at 22 m.p.h. The length of cycle is 63 seconds. Plans have been made for the use of co-ordinated control on North Avenue, a heavy crosstown street on Lincoln Highway, and on St. Paul Street, a heavy radial artery. Co-ordinated electric signal traffic control is also planned for some sixteen intersections on Baltimore and Howard Streets in the central business district. Boulevard stops are little used. Street car stopping places on the railway system as a whole average ten per mile during rush hours with the rush-hour stop plan, and twelve per mile during non-rush hours.

The features most essential to the successful solution of our traffic problems are given on page 549.

Modern Equipment Interests New Englanders

IMPROVING electric railway service through the use of up-to-date equipment was the principal subject of discussion at a meeting of the New England Street Railway Club held at Springfield, Mass., March 12. At the afternoon session W. L. Harwood, engineer of power and equipment of the Springfield Street Railway and the Worcester Consolidated Street Railway, told about the results achieved with the Springfield experimental car. An abstract of Mr. Harwood's paper appears elsewhere in this issue. He illustrated his talk with lantern slides showing details of the equipment. The advantages of the treadle door over the older type of door operating mechanism were outlined by J. H. Vander Veer, sales engineer National Pneumatic Company. His talk was accompanied by motion pictures showing operations of treadle doors on electric railway cars in many cities.

Commenting on the necessity for giving up-to-date service, Lucius S. Storrs, managing director, American Electric Railway Association, pointed out that the number of people who ride on the electric railways during the course of a year is greater than the number of postage stamps sold in the United States. Improvements being made to the local transportation systems in many cities, he said, are indisputable evidence that the public transportation industry is on the road to recovery. Charles Gordon, editor of ELECTRIC RAILWAY JOURNAL, mentioned the recent developments in car design as one of the most significant things in the field of local transportation today. W. C. Slade, vice-president, United Electric Railways of Providence, said that electric railways have been marking time during recent years because they have been undecided whether to buy more cars or to buy buses. Developments in car design fostered by the Springfield and Worcester companies will mean much, he said, to the future of the industry.

Improvements to the Springfield and Worcester Street Railway system were not made for idealist reasons, according to E. G. Buckland, vice-president New York, New Haven & Hartford Railroad. Mr. Buckland's remarks are given elsewhere in this issue.

More than 500 men, a record-breaking number for the New England Street Railway Club, attended the banquet in the evening. Howard F. Fitch, vice-president of the club, presided at the banquet and made brief remarks welcoming the men to the dinner and convention. He deviated from the regular program to introduce Clark V. Wood, president of the Springfield and Worcester railways, and the man in charge of arrangements for the record-breaking meeting. Mr. Wood welcomed the huge crowd and thanked everyone, from the officials to the track repair crews, for their presence and their interest.

Mayor Fordis C. Parker, of Springfield, welcomed the members of the club to the city. He spoke with gratitude of the efforts of the Springfield Street Railway to maintain the highest grade of service. He said that the expenditure of more than $800,000 by the company last year was evidence of the attempts being made to render the best possible service. He thanked Mr. Wood for his endeavors and experiments that had given the city a type of street car that is being copied in other communities.

The city of Worcester was represented by Mayor M. S. O'Hara, who congratulated the officials of the New York, New Haven & Hartford Railroad for their courage in buying a railway that was on its "last legs" and putting it on a sound basis again. He told how the old cars had been painted and repaired, and the service improved more than 100 per cent. He said that it was a satisfaction to have responsible persons running the buses in the city. He was proud of the fact, he said, that powerful interests would spend money on the railway property to provide better service for the residents.

Capt. Ralph Earle, president Worcester Polytechnic Institute, gave an interesting talk on the duties and accomplishments of the United States navy during peace times. Robert Burlen, of Boston, concluded with what he termed "A Message" to the effect that humor is necessary to play the game of life.

Energy Consumption Low on Springfield Experimental Car*

BY W. L. HARWOOD

Engineer of Power and Equipment Springfield Street Railway, Springfield, Mass.

SEVERAL years of thought and experimenting by the Springfield Street Railway have resulted in the Springfield experimental car.

It would be too long a story to tell of the development of the various pieces of equipment which finally went into the completed car, but after some delays and some interesting experiences, the car was finally completed shortly before midnight, April 13, 1927, and on Thursday, April 14, at 10:30 a.m., made a scheduled exhibition run with some 40 prominent persons. The run was successful beyond expectations. Between that time and May 13 this car made many demonstration runs for the benefit of men connected with the industry from many parts of the country. On May 13, 1927, it was put into regular service on one of the heaviest city lines and has to date made some 12,000 miles.

We have been operating the experimental car on one of our heaviest city lines, the State Street Line. This line operates on State Street with a maximum grade of 6.5 per cent, with some 1,300 ft. averaging over 5 per cent. The line loops through Dwight Street and returns via Main Street. The round trip is 7.1 miles and the actual running time varies from 48 minutes during the lighter periods of the day to 58 minutes during the rush hours, making the schedule speed from 7.3 m.p.h. to 8.9 m.p.h. Some tests taken last May showed 5.8 equivalent stops per mile at times of non-congestion and 13.5 stops per mile during congested periods. The car has made some 12,000 miles in this service, having been out of service for about a month, in order to go to Cleveland, and has carried some 75,000 revenue passengers (transfer passengers

*Abstract of a paper read at a meeting of the New England Street Railway Club, held at Springfield, Mass., March 22.

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not included). During this service, the car has performed very satisfactorily and has developed no major defects. When first put into service, the press named it "The Noiseless Car," due to its quiet operation. There are no gear or brake noises, the only noise being the trolley wheel on the wire and flange noise of the wheels on the rail. The low unsprung weight, combined with the long springs and rubber shock-insulators, allows the car to pass over special work with a rather pleasant click, quite different from the noise made by the conventional car. Tests made by the A.E.R.A. committee on noise reduction also show it to be more quiet in operation than our other cars.

The light weight and roller bearings allow the car to accelerate very smoothly and rapidly. Under test, rates as high as 2.2 m.p.h.p.s. have been noted, and in actual service rates average around 1.5 m.p.h.p.s.

Braking rates as high as 4.35 m.p.h.p.s. have been noted, and in revenue service the braking rates run around 2 m.p.h.p.s. While these are high braking rates, the effect on the passengers is not uncomfortable, as the rate is uniform without objectionable changing or jerky operation. This is partly due to the special material of which the brakeshoe is made, having a fairly constant coefficient of friction with varying loads, and there is no seizing action as the car comes to rest. In emergency, full brake chamber pressure can be obtained in less than $\frac{3}{8}$ second, and in service, in something less than $1\frac{1}{8}$ second which, combined with the rapid rate of retardation, makes possible stops in the shortest distance.

To get an accurate comparison of the power required by the experimental car as compared with a modern light-weight car, we equipped both the experimental car (No. 554) and one of our 50 new light-weight double-truck safety cars (No. 565), with watt-hour meters. Both cars are operated regularly on the State Street line. The results are as follows:

	Kilowatt-Hours per Car-Mile
For the month of December, 1927, the total amount of energy required, including heat, lights, air compressor, etc., for No. 554 was	3.19
And for No. 565 was	3.65
For the month of January, 1928, the energy used by No. 554 was	3.27
And by No. 565 was	3.88

That is, in December, 1927, the light-weight double-truck safety car No. 565 used 14.4 per cent more energy than the experimental car, and in January, 1928, 18.7 per cent more energy.

A special energy test of 8.7 miles, with one car following the other, making the same stops as traffic required, and measuring energy for motors only, showed an energy consumption as follows:

Car No. 554, kilowatt-hours per car-mile	1.61
Car No. 565, kilowatt-hours per car-mile	2.18
Car No. 554, kilowatt-hours per ton-mile	0.127
Car No. 565, kilowatt-hours per ton-mile	0.119

In this test the light-weight double-truck safety car No. 565 took 35.4 per cent more energy than the experimental car.

Another test of 9.5 miles over another route at rather higher speed, with fewer stops, showed the following:

Car No. 554, kilowatt-hours per car-mile	1.58
Car No. 565, kilowatt-hours per car-mile	2.11
Car No. 554, kilowatt-hours per ton-mile	0.125
Car No. 565, kilowatt-hours per ton-mile	0.116

In this case the light-weight double-truck safety car used 33.5 per cent more energy than the experimental car.

The weight of car No. 565 is 36,500 lb. against 25,300 lb. for experimental car No. 554—car No. 565 is 44 per cent heavier.

There have been no worn-out parts or replacements in the 12,000 miles of service. A thorough inspection made recently showed no wear in the bearings and the worm gear and work shaft were in perfect condition. It is too early to predict what the life of bearings and drive will be, but there is every indication of long life. Brakelinings show wear of only $\frac{1}{8}$ in. for 10,000 miles of service, which would indicate that we will obtain about 20,000 miles per set in our heavy city service. Based on 12,000 miles of operation, there is every indication of low maintenance.

New Business Can Be Developed With Advertising and Publicity*

By E. E. Soules

Manager Department of Publicity Illinois Traction System, Peoria, Ill.

FROM an industry that was largely non-advertising ten years ago there is today being spent better than $6,000,000 each year for city and interurban transportation advertising. How and why the industry has brought advertising into its operating program is of interest; what have been the results and what results may be expected is the present-day concern.

The modern railway manager uses advertising continually to keep his public informed about the affairs of his company. He has learned that it does not pay to wait until there is trouble and then rush into print and expect the public to join in the mourning. He knows that the public is not interested in the troubles of the advertiser, and that they would rather hear of success than failure; but he also believes that the public is notably fair, and that if it can be made to see that the community is directly affected by the failure or success of the transportation system it may be depended upon for support.

Ask a progressive city railway operator for concrete figures on the result of his advertising. If reports for comparative periods show increased riding he will state that in his judgment advertising, plus good service, and perhaps plus changed conditions, have all had a part in the improved reports. If reports do not show increased riding or earnings he will tell you that without advertising the story would have been worse.

Recent years have produced but few examples of increased riding on city properties. An outstanding exception with which we are all more or less familiar is the city of Chicago, where the surface and elevated lines have shown consistent increases. It is significant that both of the operating companies in Chicago have within recent years established advertising departments that have effectively used the display columns of the newspapers. It is not contended, even by the advertising man, that advertising alone has been responsible for the upward turn in Chicago. Increasing difficulties for the motorist who now finds street congestion almost unsolvable has also tended to put passengers back on the rail cars; while speeding up of schedules and rerouting of basic lines is keeping passengers on the cars. But advertising and publicity have played an important part by first telling the story of things to be done and things accomplished, then selling the public on the advisibility of doing the things planned, and finally selling them again on the use of new and improved services.

**Abstract of a paper presented before the Illinois Electric Railways Association, Springfield, Ill., March 14-15, 1928.*

Newspaper the Basic Medium

There is such a variety of operating conditions that no standardization of advertising methods has been developed by city railways. Following well-proved advertising practises the newspaper is the basic advertising medium. On the average about 65 per cent of transportation advertising appropriations is expended in the columns of the daily and weekly newspaper. The street railway and bus operator has a decided advantage in having a medium of advertising without cost in the car card space in his own cars and buses, and dashboard space on the outside of his cars, but its real value is not appreciated by many operators. In recent years city transportation advertisers have come to more generous use of outdoor advertising, principally in the form of painted bulletins. The radio, the motion picture and other novelty forms of advertising are included in the plans of a few companies.

High-pressure sales methods are not entirely lacking in city transportation advertising. In recent months we find a representative company in the midwest city offering reduced bus fares on certain "express" lines during off-peak hours of the day. In another instance we find free rides advertised for the day on which a new bus route is opened. We find other companies co-operating with retail stores on special shopping days by offering free rides during certain hours.

The advertising activities of electric interurban railways, which at first were secondary to the publicity work, have

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steadily grown. Companies were to a great extent impelled to adopt active selling and advertising policies by the keen competition offered in the transportation field, by the growth in popularity of the private automobile, the interurban type of motor bus and the increased hard road mileage. Because the interurban railways have been employing strenuous merchandise and advertising tactics over a longer period of time, there are available more examples of developing new business in this field than in that of the city operating company.

There are sufficient examples of developing new business with advertising in the interurban field to convince the doubtful operator that advertising, when coupled with sound merchandising principles and a saleable service, does produce results. Here again the first attribute to success in terms of increased business is a service that permits the electric carrier to compete on a service basis with other carriers. In every instance where the company has been able to secure and hold new customers it will be found that the quality of the service has warranted the merchandising and advertising that is used to sell it.

Selling Improved Service

In the passenger field many improvements designed for the special comfort of passengers, such as standard parlor, sleeping and dining cars, luxurious modernized coaches, faster schedules and smoother roadway, have been made by the electric railways. In the freight field there has been intensive solicitation for local freight and express, and many of the larger companies have redesigned and rebuilt motive power and equipment to place them in position to handle through freight in car lots with interchange of equipment and rates with other carriers. Advertising and publicity has had much to do with acquainting the traveling and shipping public with these developments.

Today we find electric railways not only using the pages of local publications for their freight traffic advertising story, but also the columns of traffic magazines with national circulation. In these pages the shipper of freight in San Francisco, in New York, in New Orleans is told that certain electric railways solicit freight shipments in carload lots to and from any point in the United States. The Illinois Traction System was the first electric railway to place its advertising regularly in a traffic magazine of national circulation. It began to tell this story only after it was capable of giving a valuable freight service to the national shipper, and now finds it profitable to maintain representatives in most of the larger cities for the solicitation of through freight business.

Taking an illustration from the remarkable story of the Chicago, South Shore & South Bend Railroad, we find an electric railway which through rehabilitation of its physical properties and reorganization and modernizing of its traffic and sales policies, almost doubled its gross revenues in less than two years. Advertising played an important part in this noteworthy transportation achievement, as it has also done in the rejuvenation of the Chicago, Aurora & Elgin Railroad.

There was a time when "doorbell ringing" was considered an undignified type of solicitation, but the advertiser of today appreciates the value of personal solicitation and the modern electric railway is making good use of this form of approach. The employee sales campaigns of some of the most progressive railway organizations have proved their worth as business producers for both the passenger and freight departments. The Chicago, North Shore & Milwaukee Railroad was a pioneer in this method, and it has also been used to good advantage by the East St. Louis & Suburban Railway in introducing new motor bus routes.

Many electric railways are acting as ticket agents for athletic events and theatrical attractions, reserving seats and selling combination tickets that include transportation and seat accommodations.

The direct mail medium of advertising is given an important place in the advertising plan of the modern electric railway. Lists of memberships of lodges, civic clubs, social organizations, school classes and various kinds of societies are usually available and the personalized letter announcing a special service or innovation is an effective and dignified method of approach, providing it is not repeated too frequently.

Outdoor advertising is a valuable medium in territories where population is dense and circulation is heavy. This has been demonstrated to the satisfaction of companies like the Chicago, North Shore & Milwaukee Railroad, the Chicago Rapid Transit Company, the Chicago, South Shore and South Bend Railroad and the Chicago, Aurora & Elgin, which have the advantage of telling their story to a tremendous outdoor circulation through the use of painted bulletins and lithographed posters.

Exhibits at expositions, public speaking activities, use of the radio, motion picture and other novelty advertising will be found in the advertising plans of many companies and are used with various degrees of success. Results from this form of media, however, are not easily checked and they are of value principally for general publicity purposes.

COMING MEETINGS OF *Electric Railway and Allied Associations*

April 6 — Metropolitan Section, A.E.R.A., 33 W. 39th Street, New York, N. Y.

April 25-27 — American Welding Society, annual meeting, 33 West 39th Street, New York, N. Y.

April 26-28—Missouri Association of Public Utilities, Jefferson City, Mo.

May 2-5 — Southwestern Public Service Association, Dallas, Texas.

May 6-12—Union Internationale de Tramways, de Chemins de Fer d'Interet Local et de Transports Publics Automobiles, biennial meeting, Rome, Italy.

May 9-10—Central Electric Railway Master Mechanics' Association, Erie, Pa.

June 6-8—Canadian Electric Railway Association, annual convention and exhibits, Toronto, Canada.

June 20-27 — American Railway Association, Div. 5—Mechanical (including former activities of the Master Car Builders' Association and the American Railway Master Mechanics' Association), annual convention and exhibit, Atlantic City, N. J.

June 21-22 — American Railway Association, Motor Transport Division, Atlantic City, N. J.

June 28-29—Central Electric Railway Association, Cedar Point, Ohio.

July 8-12—Public Utilities Advertising Association and International Advertising Exposition, Detroit, Mich.

July 25-27—Electric Railway Association of Equipment Men, Southern Properties, Cincinnati, Ohio.

July 27-28—Central Electric Railway Accountants' Association, Detroit, Mich.

Aug. 16-17 — Wisconsin Utilities Ass'n, Transportation Section, Sheboygan, Wis.

SEPT. 22-28, 1928

American Electric Railway Association, 47th annual convention and exhibit, Cleveland, Ohio.

American Association News

Entertainment

PLAN early and well, was the motive of C. S. MacCalla, chairman of the entertainment committee, in calling the meeting held on March 26 at association headquarters in New York. Last year's results were discussed and plans were developed for the coming convention to be held during September in Cleveland.

With the addition of a theater seating 5,000 and a smaller ballroom now being completed on the auditorium property it was planned to have all social events on the "pier," as the verbiage goes after so many years at Atlantic City.

The meeting was headed by C. S. MacCalla, chairman, and attended by J. C. McQuiston of East Pittsburgh, vice-chairman; Ralph Emerson, Cleveland; Joe Stewart, Jr., Cincinnati; S. J. Cotsworth, Philadelphia, and John A. Dewhurst, L. S. Storrs, J. W. Welsh and A. A. Hale, all of New York.

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News of the Industry

Short Railroad in Michigan Does Trick

An interurban railway line boasting of only 8 miles has reversed the usual order of things by threatening to run a bus line out of business. It is the United Suburban Railway "the shortest railroad with the longest list of stockholders in the United States" that has turned the trick. Started in July, 1927, with 700 stockholders, the line runs from Grand Rapids, Mich., southwest to the village of Jenison, Mich. A bus line has covered the same route for the past few years but offered its equipment and franchise to the railroad this month for $57,000. The stockholders see little value in purchasing the line.

In 1926 the Grand Rapids, Holland & Chicago Railroad succumbed to the competition of the bus lines. With the passing of this road the residents of the territory between Grand Rapids and Jenison had no means of transportation. The bus line service did not satisfy and finally the commuters decided to own their own service.

Five cars were ordered from New York City and on July 17, 1927, using the defunct road, the first trips were made. Later it was found necessary to lease an additional car from the Grand Rapids Railroad, and early this year two more new cars were ordered from the East.

At the first annual meeting of the stockholders the books showed a profit of $2,950 for seven months of operation. Each succeeding month has shown an improvement. December, with its heavy holiday traffic, was expected to top the list, but its high mark was exceeded by January, which in turn was surpassed by February.

Hope is held out that the initial cash dividend would be paid next year. However, the 700 stockholders who reside along the right-of-way feel that they are receiving substantial dividends through increased property values since the resumption of operations.

Toronto Men Want New Agreement

Features of a new agreement shortly to be submitted by the employees of the Toronto Transportation Commission, Toronto, Ont., are a clause to give all employees two weeks' annual vacation with pay, and an increased schedule of wages for the maintenance department. With the exception of a proposed increase to maintenance men and the request for two weeks' vacation with pay, the new agreement differs little from the present, which expires March 31. The employees take the position that since they are in the employ of the city they are as much entitled to a vacation without any penalty as are other city employees.

The agreement will be for two years. It will probably not be dealt with before General Manager Harvey's return from England.

Talk of Lackawanna Electrification Revived

Representatives of 23 North Jersey civic organizations on March 27 told J. M. Davis, president of the Delaware, Lackawanna & Western Railroad, that they would use their influence to increase commutation fares if his company would electrify its lines to commuting communities. The project of electrifying these lines has been talked of for twenty years, but this was the first time that spokesmen for the public involved have come forward to aid the project. Mr. Davis said he would give the suggestions that have been made serious consideration.

It is proposed to operate trains electrically on 75 miles of road. These would include the lines from Hoboken to Montclair, Dover and Bernardsville. The cost would be about $13,000,000 if the railroad bought power from outside interests or $17,000,000 if it constructed its own generating plant.

Mr. Mitten and Amalgamated Negotiate

Conditions in Philadelphia and Buffalo to remain as at present so far as organization activities are concerned. Two-thirds secret vote will fix policy on any new lines

ANNOUNCEMENT was made on March 28 that Mitten Management, Inc., had reached an agreement with the Amalgamated Association for union labor co-operation where Mitten Management in the future may acquire or operate any transportation system, providing two-thirds of the employees of the system by secret vote agree.

Mitten Management, Inc., of which Thomas E. Mitten is the head, manages the operation of the Philadelphia Rapid Transit Company system and the operation of the International Railway system at Buffalo, but these companies are not affected by the agreement.

The agreement was reached after a series of conferences in Atlantic City among Thomas E. Mitten and his son, Dr. A. A. Mitten, chairman of the boards of the Philadelphia Rapid Transit Company and the International Railway, and W. D. Mahon, president of the Amalgamated Association; his son, O. L. Mahon; L. D. Bland, treasurer, and P. J. Shea, vice-president of the Amalgamated. The conference was arranged by W. Jett Lauck, a labor economist and former secretary of the War Labor Board.

The full memorandum of the union-management agreement, dated March 25, follows:

Mitten Management reiterates its desire to deal with organized labor whenever and wherever any union organization will undertake to co-operate for increased economic efficiency and where two-thirds of the employees, by secret ballot, may so elect.

Mahon and associates, speaking for the Amalgamated Association of Street and Electric Railway Employees of America, being also desirous of co-operating in economic accomplishment and of aiding their membership to a 50-50 participation in the rewards rightfully paid to men and management, in addition to the present wages paid, have now come to an understanding with Mitten Management, Inc., by which the following procedure will hereafter govern both parties:

The P. R. T. Co-operative Plan of 1926 shall be made effective with the union covering such system, or departments of a system, as the union may designate, after two-thirds of such employees shall have so determined by secret ballot, it being fully understood that the right to organize is a fundamental right of labor which should not and cannot be permanently abridged or denied, but it is now understood and agreed that the activities of the Amalgamated in this respect shall be restricted to properties that are to be acquired or operated by Mitten Management in the future.

So far as Philadelphia and Buffalo are concerned, conditions there are to remain as at present in so far as organization activities are concerned, it being desirable that the situation on these properties shall remain as at present in order that the standard of economic excellence of these companies now being operated by Mitten Management be the standard by which union performance in co-operating with Mitten Management on other properties shall be measured. When co-operation between the Amalgamated and Mitten Management has developed to a point where the results are equal to those obtained on these properties, the matter of union-management agreements on these properties may be discussed and be made the basis of further agreement.

Working agreements including standards of work and compensation to be matter of local arrangement and ratification. Collective consideration to be upon the basis of group representation through branch, departmental and general committees, with recourse to arbitration in case of failure of agreement. Before arbitration shall be re-

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sorted to, however, the matter under discussion shall be submitted to two representatives of the International Association and two representatives of Mitten Management for review and attempted settlement. Failing agreement one arbitrator for employee and one arbitrator for employer shall be chosen, these to select a third. If these two arbitrators are unable to agree upon the third arbitrator then the Public Service Commission shall act as the third arbitrator.

Contract shall run during delivery of co-operative effectiveness, which is understood to mean that degree of assistance in securing the result on the property in question as secured by Mitten Management on the properties operated by them at this date. Non-performance by either party to be settled through arbitration. Contract may be terminated by vote—secret ballot—of two-thirds of the employees represented by the organization. Operating company and union each to supply, at their own cost, their representatives on the 50-50 collective consideration committees, also each its own secretary. Operating company and union to share equally in the office and operating expenses as mutually decided. Operating company to, where two-thirds of the employees so vote, collect by check-off system and pay to organization such amounts as the organization may from time to time decide. All the employees of the departments involved to be so assessed. Funeral, disability, old age and all other benefits to be undertaken by the union, for which operating company will pay union $1 per month per man.

In addition to the usual results of collective consideration, it is the further object of this arrangement to secure for all interested parties the advantages of collective effort and accomplishment. To the owners this will mean a fair return on their property; to the public an adequate and efficient system of transportation; and to employees, in addition to wages sufficient for the necessities of life, comfort and savings, an opportunity to participate in increased earnings made possible by their increased effort and productive efficiencies. Mitten Management and Amalgamated Association are agreed that the same 50-50 participation shall be effective between "management and union" as now exists between "management and men," and the sense of this agreement is that both shall supply the same degree of co-operation and both similarly shall participate in the results secured therefrom.

It is explained that T. E. Mitten and W. D. Mahon have been seeking industrial peace for more than 30 years. Each has always had great respect and admiration for the other. Yet more than half the time each has been obliged to fight the other by the force of the powers to which Mr. Mahon owned his leadership as president of the Amalgamated and Mr. Mitten his position representing capital.

Twenty years ago Mr. Mitten endeavored to secure co-operation as between capital and labor, but "neither the force let by Mr. Mahon nor the capital represented by Mr. Mitten could be brought each to trust the other at Chicago, and Mr. Mitten came East in 1911 to try his 50-50 plan as between labor and capital in Philadelphia where it was fully intended by Mr. Mitten and Mr. Mahon that the union and company would co-operate."

The P. R. T. co-operative plan of 1911 was signed and all looked well, but insurgents in the forces of organized labor caused it to fail in polling the agreed two-thirds vote. Then came sniping by labor at Mr. Mitten, who for the past fifteen years "has been forced to fight off organized labor and against conservative capital to protect his 50-50 plan, which is now generally admitted to have proved beneficial alike to employees, owners and public." In conclusion an official statement said:

"All's well that ends well" and "everything happens for the best" are old and trite sayings. These have proved true here. Capital has now capitulated, and had Mr. Mitten and had Mr. Mahon worked together from 1911 forward as planned, their very association would have encouraged radical labor and reactionary capital to such opposition as would have made impossible the wonderful results secured by Mr. Mitten and the men of Philadelphia and Buffalo. These two cities, independently operated, can be now used as a measuring stick for results to be obtained wherever Mitten Management and organized labor can be combined.

This resolution, dealing with the Mitten-Mahon agreement, was adopted by the employee committee men of P. R. T., on March 27.

Whereas Mitten Management has made a formal agreement with the Amalgamated Association covering future relations; and

Whereas the basis of this agreement is the policy of men and management co-operation and fair dealing which has since 1911 guided the activities of men and management on P.R.T. system; and

Whereas this agreement in no way affects the present relationship between P.R.T. employees and Mitten Management under the co-operative plan, but on the contrary makes the men of P.R.T. system, with independent operation, the pattern of co-operative efficiency by which future Union-Management accomplishment will be measured: Therefore be it

Resolved, that the joint convention of employee and employer committees of the Philadelphia Rapid Transit Company obligate themselves jointly to maintain such a continuing degree of excellence in co-operative efficiency as will well justify the confidence thus expressed in us. And be it further

Resolved, that we indorse this agreement and extend to Mitten Management our congratulations on this accomplishment which, after many years of misunderstanding, indicates the acceptance by organized labor in the street railway industry of the fundamental principles of the Mitten plan.

Uniform Franchise Expiration Sought

An application has been filed with the City Council by the Spokane, Coeur d'Alene & Palouse Railway, Spokane, Wash., the Great Northern subsidiary owning and operating the former Inland electric railway system, asking that its franchise on Main Avenue, between Washington and Wall, be extended until 1930 in keeping with the expiration dates of other franchises held on that street. The company is not operating electric cars over this part of its line, but has leased the trackage to the Spokane United Railways. It has three franchises on Main Avenue, and wants a common date of expiration for all of them.

Progress on Merriam-Shawnee Line

Officials of the old Hocker Line, christened the Kansas City, Merriam & Shawnee Railroad, are planning to rush its opening. Work of putting back that part which was torn up after the line was sold last winter is expected to start immediately.

The new line has been granted a charter and has applied to the Public Service Commission to operate from Eighth Avenue and Southwest Boulevard in Kansas City, Kan., through Merriam and Shawnee to Rose Hill. The reorganized company may be able to resume service about Easter.

Fare Increase in Los Angeles Denied

Holding the 5-cent fare of the Los Angeles Railway, Los Angeles, Cal., to be "not unreasonable" the California State Railroad Commission in a decision made public on March 26 unanimously denied the company's application for an increase from the present 5-cent fare to a 7-cent fare or four rides for 25 cents. Application for the increase was made to the commission on Nov. 17, 1926. A valuation of the properties made by the commission was declared to amount to $42,000,000. This was used as a rate base. The figure includes undepreciated cost of properties with land at present values; also an allowance of $750,000 for materials and supplies on hand and of $250,000 for work in progress.

In its decision the commission declared the net earnings for 1927 to be $2,070,261 or 4.9 per cent on the rate base of $42,000,000. The commission held that this return had been earned in spite of the fact that the company had made no effort to take advantage of possible economies pointed out by the commission at previous hearings on the question.

Commissioner Carr in a separate but concurring opinion declared that this was the second time that the Los Angeles Railway Corporation had applied to the commission for permission to depart from the 5-cent fare and enter upon what he termed "the unchartered sea of multi-coin fares," this referring to the proposal to issue tokens at the rate of four rides for 25 cents. He pointed out that on May 31, 1921, the commission issued an order permitting the company to charge a 6-cent fare with ten tokens or tickets for 50 cents, under certain conditions which the company did not accept. He added that during the period 1921-1927 under the 5-cent fare, the company realized average net earnings of 6.6 per cent. The fluctuations, the commissioner continued, indicate the danger of attempting to arrive at a satisfactory conclusion as to rates based upon the experience of as short a period as one or two years. He said he believed there was no convencing evidence that the present cycle of low earnings was permanent.

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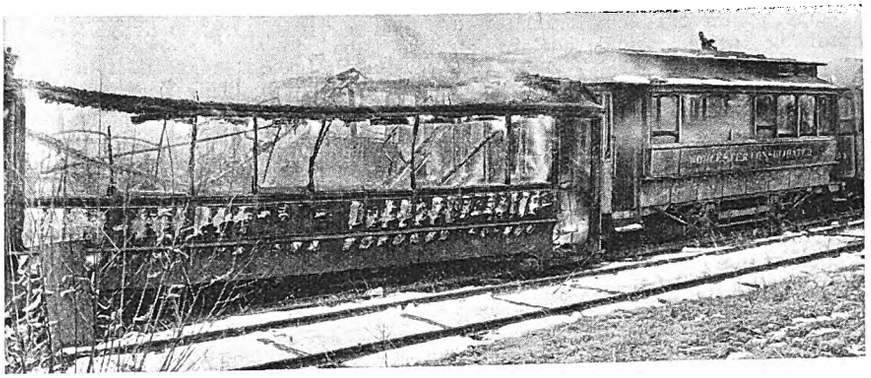
Graveyard Fires in Worcester and Springfield

Under the plan of the New York, New Haven & Hartford Railroad for the thorough rehabilitation of the railway properties in both Worcester and Springfield, Mass., a group of 130 cars was burned recently in Worcester. This group is part of 189 cars burned during the last two weeks. The grand total of cars in Worcester sold for scrap and to be burned is 375. In addition 128 obsolete cars formerly operated in Springfield are to be fed to the flames.

As has been noted before in the ELECTRIC RAILWAY JOURNAL, the program of burning old equipment is part of the process of putting the Springfield and the Worcester properties in first-class operating condition by the purchase of new cars, reconstruction of track, building of a new carhouse and garage in Worcester and the elimination of all facilities that cannot be rehabilitated and put into efficient operating condition.

The final chapter that made possible the program now being carried out at Worcester and Springfield was written early in January, 1927, when the Public Utilities Commission of Massachusetts approved the acquisition of stock of the New England Investment & Security Company by the New York, New Haven & Hartford Railroad. The commission at that time approved the acquisition of $300,000 of first mortgage bonds of the Springfield Street Railway, authorized the issue of shares of preferred stock of the New England Investment & Security Company and authorized the acquisition of outstanding shares of the common stock of the New England Company.

Almost immediately thereafter the New Haven Railroad entered upon the program of rehabilitation calling for the expenditure of many millions of dollars on these properties that is now fast being brought to completion. Included in that program has been the realignment of the systems in both cities with the lopping off of many railway branches operated in territory sparsely settled and the substitution of bus lines for them with subsequent co-ordination of both railway and bus lines on a scale perhaps never before attempted in cities situated similarly to the two very thriving industrial communities of Massachusetts served respectively by the Worcester Consolidated Street Railway and the Springfield Street Railway.



A hook-up with the past unloosed

Would Appeal Frankfort Ordinances

An appeal from two city ordinances at Frankfort, Ind., was taken on Feb. 23 by the Terre Haute, Indianapolis & Eastern Traction Company in petitions filed with the Indiana Public Service Commission, protesting against the speed limit of 4 m.p.h., that has been fixed by the City Council in Frankfort and other regulations pertaining to track repairs. The railway was recently ordered to pave between its tracks and because of failure to do this, the Council, it is said, passed the speed regulation as a retaliatory measure.

Interborough Not to Appeal Decision in Labor Suit

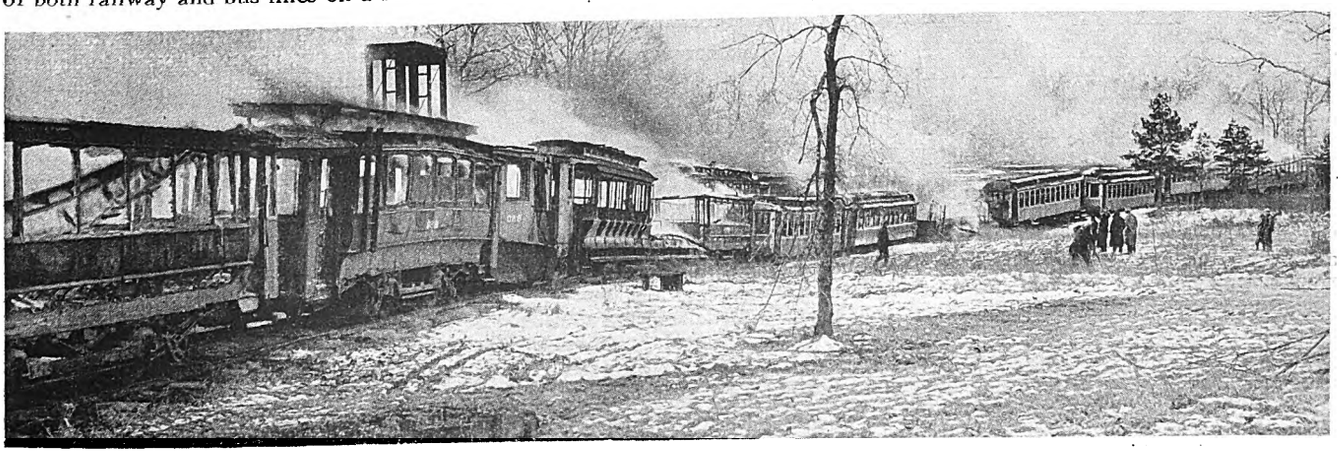
James L. Quackenbush, general counsel for the Interborough Rapid Transit Company, New York, on March 23 notified Nathan D. Perlman, counsel for the Amalgamated and other labor bodies, by letter that he had decided not to appeal from the decision of Supreme Court Justice Wasservogel denying the company the restraining orders sought. The Interborough has dismissed most of its employees who joined the union and the labor organizations failed to carry out strike threats.

Terminable Permit Bills Signed by New York Governor

Governor Smith, of New York, has approved the two Thayer bills, the one amending the transportation corporations law, to provide for terminable permits for stage, omnibus and motor vehicle lines, as chapter 717 of the laws of 1928, and the other amending the railroad law, to accomplish the same purpose for street surface railroads, as chapter 733 of the laws of 1928. The bills provide that every city, town or village, in addition to other powers now conferred on them by law, shall have power to grant to street railways and to bus corporations a terminable permit to occupy and use its streets.

Every such municipality shall have power to enter into an agreement for the purchase of and to acquire by purchase all or any part of the property, plant and equipment of such a corporation actually used and useful for the convenience of the public, operating under terminable permit, and upon purchase thereof to operate, or to contract with any person, firm or corporation for the operation thereof. Power is also granted to the municipality to amend any existing license, grant, franchise or permit, or any of the conditions thereof, whether granted by municipal authority or directly or indirectly by the state or otherwise, or any consent of local authorities, or any of the terms, provisions or conditions thereof, relating to construction or operation.

Every terminable permit and every amendment to any existing license, grant, franchise, permit or consent in-



One horseman fire visits Worcester

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corporating therein the terms of a terminable permit, shall contain an irrevocable option for the purchase by the city, town or village, either directly or through its nominee or nominees, of all or any part of the property of the transportation corporation.

All terminable permits and amendments thereto are to be subject to the approval of the Public Service Commission or the Transit Commission.

It has been hinted that the immediate effect of the bill will be to further a proposal to reorganize the surface transportation of Brooklyn in order to overcome the city's objection to inclusion of surface railway lines in a comprehensive unification plan.

Wage Hearing in Fort Wayne

A hearing was held in the Allen County Courthouse, Fort Wayne, Ind., on Feb. 27 before Commissioner Harvey Harmon at which operators and officials of the Indiana Service Corporation presented their arguments on the employees' petition for an increase in wages. The men, who had asked the Public Service Commission for a hearing, contended that the wage scale at present was inadequate and the company stated that business conditions and a general falling off of electric railway revenues made it impossible at the present time to grant the requested increase. Following the taking of testimony from the men and the company the commissioner said that a later date would be set for oral arguments before the full commission.

Crash on Long Island Injures More than a Score

A twelve-car train of the Long Island Railroad left the rails in the Sunnyside Yards in Long Island City on March 28 at 8:15 a.m., bringing serious injury to four, lesser hurts to 30 more, and ripped up 600 ft. of roadway, bringing commuters to their offices late and demoralizing traffic on the road throughout the day. Four investigations are under way as to the cause of the wreck. The derailed train was made up of sections coming from Speonk and from Long Beach combined at Jamaica.

New York City to Try to Recover Subways

The Board of Estimate of New York voted on March 29 to sue the Interborough Rapid Transit Company for the return of the city-owned subways as the city's answer to the Interborough's attempt to raise the fare to 7 cents. The counter suit was not started, however, because a federal court decision which former Comptroller Charles L. Craig, the city's new special counsel, is awaiting was put off until April 2, at which time a hearing before the Federal Statutory Court, scheduled for March 29, will also be held.

$75 for Best Design in St. Louis

Miss Florence Boeffer, St. Louis, Mo., a student in the Fine Arts School of Washington University, submitted the design which will be used by the St. Louis Public Service Company to mark all its street cars and insignia. She won the first prize of $75 in the contest conducted by the company among the students of Washington University. Miss Roberta Shine won the second prize of $50, while the third prize of $25 went to Fred Dreher. More than sixty students participated and some submitted as many as fifteen designs.

Prize winning design

The design is suitable for use on cars and motor buses, on badges of conductors, motormen and chauffeurs and on caps and uniform buttons as well as for stationery and other printed matter.

Still Dallying with Boston "L" Legislation

There are no clear-cut lines yet for the form that the Boston Elevated Railway legislation may take this year, although the matter has been before the Massachusetts Legislature almost daily since its opening. Opinion sways with the wind. From present indications it seems likely there will be no Elevated legislation, though Governor Fuller has stated more than once that he will keep the Legislature in session all summer, if necessary, to straighten out the Elevated situation.

It is quite clear that no public control bill can get through the house and no public ownership bill can get through the senate. Both branches are opposed to returning the road to the stockholders. On the other hand, the Committee on Metropolitan Affairs and Street Railways has voted, fifteen to fourteen, to report a bill for public ownership, but some of the members who voted with the majority are known to have done so merely to break the deadlock and are not in favor of public ownership.

Matthew C. Brush, president of the American International Corporation, New York, and former president of the Boston Elevated Railway, was in Boston during the week ended March 24 and delivered a bristling address before the Boston Chamber of Commerce, in the course of which he rejected as useless all the propositions that have been raised before the Legislature this year. Among other things he said:

You have an impossible situation over the Elevated Railway problem. You haven't suggested a solution up to 12:30 p.m. today. I have no suggestion to make. But I do advise you not to rush into a solution until you are dead sure you are right. A hurry-up job is worse than none at all.

The statement in the interview attributed to Mr. Brush to the effect that the road could be run profitably on a 6-cent fare has since been denied.

New Franchise Sought in Wichita, Kan.

The Wichita Transportation Company, controlling both street cars and buses in Wichita, Kan., has asked the city commission for a new franchise. In return, the corporation promised the highest efficiency possible in transportation and the directors pledged themselves to fight with the commission for a return of "home rule" over buses to Wichita.

Robert C. Foulston, attorney for the carriers, explained at the start that his board of directors had decided that it was best that control over both street cars and buses be vested in the city.

The terms of the franchise were then discussed. The new franchise would run for twenty years. The carrier would have the right to supplement and extend its lines by automotive equipment as it became necessary and the commission would have the right to demand such extensions as it deemed necessary. The City Commission, by right of the ordinance, could fix the bus and car fares, but should not deny the company the right to earn 8 per cent, with any excess over that amount to be applied to the reduction of fares.

At the start, both bus and car fares would be 8 cents for one fare, 15 cents for two, 35 cents for five and $1.50 for 24 fares, with the universal transfer system in force.

There would be co-ordination between cars and buses with competitive elements eliminated. The city would retain the right to purchase the transportation system any time that it desired, providing a fair price was paid for the properties. Mr. Foulston was unable to state the value of the system, but he gave the combined property account at about $3,000,000. As to the financial condition of the company now, it was said that there are $1,490,000 in first mortgage bonds, $300,000 in 7 per cent preferred stock and $500,000 of preferred stock in the Wichita Transportation Company, recently floated to buy the independents, build a garage and add new equipment. There was a floating indebtedness which he could not describe as to amount.

Mr. Foulston stated that only one year remains for Howard Wheeler, R. C. Clevenger, R. B. Campbell and associates to finance the local transportation system which they plan to take over from the Illinois Power & Light Corporation. The franchise is considered necessary if this financing is to be consummated. He said there will be 20,000 shares in the new system. A total of 4,000 shares will be held by the Illinois Power & Light Corporation and 16,000 will be in the hands of the local cap-

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italists. They must refinance the 16,000 shares by next March 1 to get the properties.

Mayor A. J. Coombs has indicated that an early answer may be expected from the city.

Valuation Figures in Madison Vary

In connection with the valuation news about the Madison Railways contained in the article in the JOURNAL for Feb. 11, page 252, it should be explained that the Railroad Commission of Wisconsin, in a late hearing, valued the property on the basis of reproduction new at $1,559,089 and less depreciation at $1,268,096 whereas the expert engineers of the company in valuation proceedings valued the property in detail with each item clearly set forth at $2,188,501 and less depreciation at $1,960,216.

It is understood that the company considers the valuation placed upon its property by the Railroad Commission engineers very much less than any court of equity would approve. In the meantime it has accepted in good faith the ruling of the commission with reference to fares in the hope that the outcome will be mutually satisfactory to the company, the city, and the commission.

Another Move in Baltimore Fare Case

The People's Corporation at Baltimore, Md., has asked the courts to set aside the Public Service Commission's decision granting the United Railways a 9-cent cash fare with three tokens for a quarter and return to the old 8-cent rate with two tokens for 15 cents.

The appeal from the commission's February ruling was filed in Circuit Court No. 2 by Linwood L. Clark, counsel for the People's Corporation. The People's Corporation, according to Mr. Clark, is composed of numerous civic organizations having a combined membership of 300,000.

Counsel for the United already has carried to the same court its appeal for a straight 10-cent fare which the company asked in its petition to the commission last August.

Need of Increased Fare for St. Louis Stressed

Unless the fare increase sought by the St. Louis Public Service Company, St. Louis, Mo., is granted by the Missouri Public Service Commission it will be impossible to maintain the railway system on the present 80 per cent efficiency basis according to a brief of the company filed with the commission on March 9. The company seeks a straight 8-cent fare for adults, this rate to be based upon a property valuation of $75,000,000. This fare would net the company approximately $2,000,000 which is only 6 per cent on the valuation claimed. Refusal of the increase requested would, the brief says, "drive the company into a pecuniary decrepitude which would result in another receivership, and the property and equipment would fall into a condition of disrepair which could only be corrected after the lapse of many years and the expenditure of many millions."

The city in its brief contends the valuation of the company's properties should not exceed $53,000,000. This is only $1,000,000 greater than the tentative valuation fixed by the commission pending the completion of the rate case. It was the contention of the company that the reproduction value of its property would be $98,573,000. The rate case has been before the commission since June, 1926.

Grand Rapids Solicits Suggestions

Employees of the Grand Rapids Railroad, Grand Rapids, Mich., are asked through the columns of *The Token*, the official paper of the company, to submit their ideas on the betterment of service and working conditions for their own benefit and the benefit of patrons. The men are asked to drop suggestions in the suggestion box in the carhouse, shop or general office and not to let an idea slip away, go undeveloped or unknown where it might do the company and others much good. In the February issue of the paper awards are announced for such suggestions as coat hooks on cars for operators' overcoats, blanks for operators' use in caring for mistakes of passengers in farebox errors, and many others.

Wages in Memphis Unchanged

Wages on the Memphis Street Railway, Memphis, Tenn., shall remain unchanged the board of arbitration decided on March 23. Declaring the present scale a satisfactory one the board denied the union's demand for a 9½-cent increase and the company's demand for a 7½-cent decrease. For one-man car operators the men sought an increase in the differential from 5 cents to 20 cents. This finding becomes effective on April 1. A. B. Galloway, representative of the union, dissented from the majority report, signed by W. A. Ransom, chairman and neutral member, and Frank N. Fisher, company member.

Back of the proceedings just ended are many months of almost continuous negotiation by both union and employers for changes in the wage scales. In the spring of 1926 an arbitration board granted the men an increase in hourly wages of 2½ cents. That scale which is continued, provides 47.5 cents an hour for men who have worked with the railway for less than two years, 52.5 cents an hour after the second year, and a top wage of 57.5 cents an hour for three-year or more men.

T. H. Tutwiler, president and general manager of the railway, says the company will make a new contract "upon a reasonable and satisfactory basis."

Hearing on Chicago "L" Increase on April 28

Consideration by the Illinois Commerce Commission of the Chicago Rapid Transit Company's application for an increase in fares, which began in Chicago on March 15 with the presentation of evidence by the company, has been postponed until April 28. The company is asking to have the $1.25 weekly pass and the three-for-a-quarter ticket rate abolished, leaving only a straight 10-cent cash fare.

H. J. Dunbaugh, attorney for the Rapid Transit Lines, explained that the company is receiving a return of about 3½ per cent on its investment, while the commission itself has held that a return of 7½ per cent would be fair. The proposed increase will bring the company's return up to only 6 per cent.

Mr. Dunbaugh recalled that in 1919 the Illinois Commerce Commission found the value of the Rapid Transit Lines properties to be $86,250,000. However, since that time, he contended the value had increased nearly $10,000,000. Harley Johnson, general manager, testified that wage increases since 1922 had totaled $1,251,339.

In deferring the hearings until after the April primaries, David H. Jackson, chairman of the commission, has allowed the city more time in which to prepare its testimony.

Right-of-Way of Chicago & Southern Becomes Highway

The Will County board of supervisors has just concluded negotiations for the purchase of the right-of-way from the Kankakee County line north to Monee, a distance of 6½ miles, formerly used by the Chicago & Southern Traction Company. Paralleling this strip must come an additional 40 ft., being purchased from land owners. This will supply the 90 ft. necessary for the construction of the new super-highway by the state of Illinois between Kankakee and Chicago, the first stretch of 4 miles, extending from Kankakee to the north, being under construction by the state. The railway suspended 2 years ago.

Dispute Ends Amicably in Winnipeg

A dispute in Winnipeg, Man., Canada, over the dismissal of a conductor of the Winnipeg Electric Company has been settled without the threatened strike. Through the efforts of two members of the Conciliation Department and Hon. Peter Heenan, minister of labor, and A. W. McLimont, president of the company, negotiations were opened and the men's committee agreed to have the conductor reinstated in some capacity other than that of conductor. The company maintained that since it was misconduct on the part of an employee it was therefore a matter of discipline and required no board of conciliation. Conciliation proceedings were set up under the industrial disputes act by the Canadian Government.

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No Date Set for Public Utility Hearings

The Federal Trade Commission states that the date for beginning public hearings in connection with inquiry into public utilities has not been definitely decided. Commissioner McCulloch, who authorized the statement, said every effort was being made to speed the day when the session will be started.

Commissioner McCulloch's interpretation of the Senate resolution is that while the Senate prescribed an investigation of a public nature, "it intended that we make preliminary inquiry and collect facts upon which to base our evidence for introduction at the hearings. Thus the whole inquiry falls naturally under two headings, general investigation and public hearings."

He added that he was anxious to begin the public hearings in the utilities investigation at the earliest possible moment, but that so far the commission had not reached the stage where it was ready to proceed.

The preliminary inquiry now in process has generally to do with business and financial facts on the one side and the question of alleged propaganda and influencing of elections on the other.

A. G. Mott Defends Zone Fare for Key System

Defending his 5-cent zone fare plan, which the Key System Transit Company, Oakland, Cal., is opposing, A. G. Mott, chief engineer of the California Railroad Commission, occupied the stand the entire day at the rate hearing before Commissioner Clyde Seavey on March 21 in San Francisco. Operation of street cars under his plan, Mr. Mott declared, would increase the company's annual revenue anywhere from $134,000 to $834,000. The engineer further asserted that a rate increase would result in a decrease in patronage that would bring about curtailment in service followed by a further patronage decrease. He estimated that a rate increase from 5 to 6 cents would bring a 20 per cent patronage loss, an increase to 7 cents a 40 per cent loss, and an increase to 10 cents a 73 per cent loss.

The cross-examination of Engineer Mott was resumed on March 24. This rate hearing has been going on intermittently for three months and is now nearing the end. Key System officials contend that operation of the Mott 5-cent zone plan would force the road into bankruptcy. The company wants a 10-cent fare with $1 weekly passes.

Illmo Limited in Operation

The Illinois Traction System has added two parlor-car trains to its fleet between St. Louis and Peoria. The new trains are known as the Illmo Limited. The trains are dispatched from St. Louis and Peoria, Ill., at 10 a.m. daily, making the run in five hours.

Recent Bus Developments

Detroit Operation Raises Storm

Purchase of additional vehicles must await special report. Inquiry into results of present operation

THE Detroit Street Railway Commission has ordered a complete survey of the department's bus system under supervision of William B. Mayo, chief engineer of the Ford Motor Company and consulting engineer of the department. Until this survey, which will study the department's methods of bus cost accounting, the commission decided to defer considering purchase of additional buses.

Commissioner Barlum called the meeting to order at which this decision was made. Commissioner John J. Gorman is reported to have then said:

I hope my criticism won't be taken as a reflection on the manager, but I haven't had a good reason presented to me why these additional buses should be purchased. Likewise I have heard no description of where they are to be used. I have made an investigation and I find that the department has a lot to learn about bus operation.

We should know costs. Our statement shows that it costs 24 cents a mile to operate buses, while, as a matter of fact, the cost is nearer 34 cents a mile. There are many things, such as cost of supervision, pro rata share of overhead on shop equipment and other similar items, that are not charged against bus operation. We have no definite figures.

Isn't this going too fast? As our finances are nothing to brag about, wouldn't it be wise to hire outside aid to investigate the department's bus situation? The Woodward Avenue line lost $80,000 a year. Out of 43 lines, only fifteen show a profit under the department's own figures. Obviously we need buses, but we should postpone buying more until we investigate.

"I'm told our shop methods are lax. We don't know definite costs. We are groping in the dark about the operating costs of the eleven or twelve different type buses. I haven't talked with any one in the department who has practical experience in operating buses.

General Manager Smith, of the department is said to have replied:

The double-deck buses, purchased eighteen months ago, I had nothing to do with. They are obsolete now and we can't forecast what type of bus is to come three years hence. I don't think we can defer enlarging our system. The new buses will be used on Chalmers and Livernois Avenues, the two fastest growing lines in Detroit. Our bus traffic has grown from a few thousand to upward of 37,000,000 passengers last year. You can bring in a staff of reputable engineers and if they don't tell you that the buses are operated economically, I'll resign. There has been a lot of misinformation and not enough real information handed around.

After Mayor Lodge intervened, Mr. Smith continued to answer questions of both commissioners with the statement that "bus costs might be a shade more than is shown in the auditor's figures," and Mr. Barlum retorted: "If we don't get costs of bus operation, we had better get new auditors." Mr. Smith also stated that cost figures on each type of bus are being segregated now.

The Mayor is quoted as follows:

Shortly after election, I studied the audits of Mr. Hauser and Price-Waterhouse and came to the conclusion that, if possible, I would have an entirely neutral firm take the two audits and reconcile them. Ralph Stone, of the Detroit Trust Company, consented to do this and his report will be ready about May 1. There was no use for me to do this and I wanted some one in whom the public had confidence. Until May, we won't be in any position to talk about accounting.

As to bus operation, I don't believe the D. S. R. general manager wants to do anything unnecessary and I am glad that Mr. Gorman has raised his questions. I should like to have the survey made for me and also for Mr. Smith. And Mr. Smith, I should like to have you consider carefully the question of turning the D. S. R. purchasing department over to the city purchasing department.

Sale of Louisville Franchise Set

Mayor Harrison of Louisville, Ky., affixed his signature to the bus franchise ordinance he sponsored and which had passed the Board of Aldermen on March 20. The ordinance was passed without a dissenting vote. John Chandler, attorney for the jitney bus operators, and George C. Burton, representing labor interests, opposed the measure. On March 22 the Board of Public Works announced that the bus franchise provided for in the new ordinance would be sold at public auction on April 2. The sale is regarded as a matter of form since the ordinance was drawn with a view to the acquisition of the franchise by the Louisville Railway.

Shore Line Operating Offices Removed to Hammond, Ind.

J. C. Johnson, general manager of the Shore Line Motor Coach Company, a subsidiary of the Chicago, South Shore & South Bend Railroad, and a large mechanical and operating personnel were removed recently from Michigan City and are now housed in the company's new garage and office building in Hammond, Ind. Removal of the company's headquarters from Michigan City to the more central point on the system was effected because of the sale last December of the Shore Line routes from Chicago to Detroit and from Benton Harbor north to Muskegon, Mich., to the Motor Transit Corporation of Chicago. The service between Chicago and Benton Harbor is still maintained, however. A small staff and office is still retained in Michigan City to handle the Benton Harbor division.

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Operators in Cleveland Rewarded for Safety Records

Morse W. Rew, superintendent of the motor coach department of the Cleveland Railway, Cleveland, Ohio, at a dinner at the Winton Hotel in that city on March 16 made the first awards of this kind to 98 men who had operated three months without a chargeable accident. As chairman of the evening Mr. Rew introduced Judge Skeel, president of the Cleveland Safety Council, who talked to the coach drivers on the part that safety plays in safe driving. Earl J. Harrington, superintendent of accident prevention division, also talked briefly on the relationship of accident prevention to operation of coaches.

An outstanding fact was that eight of the drivers operated during the period of three months without any accident, either chargeable or non-chargeable. Should these men continue this record for one year, they will receive a certificate symbolic of their good operating record.

As a means of promoting safe operation a committee of coach drivers recommended to the management on Nov. 1, 1927, that awards be made to the coach drivers who operate without chargeable accidents. The recommendation was approved, and awards were arranged upon the following basis:

Bronze safety pins for those drivers who operate three months without chargeable accidents.

Silver safety pins for those drivers who operate six months without chargeable accidents.

Gold safety pins for those drivers who operate one year without chargeable accidents.

It was in accordance with this plan that the first awards were made on March 16.

Buses to St. Louis Zoo

The St. Louis Public Service Company, St. Louis, Mo., has been granted permission to operate buses on Sundays and holidays along Kingshighway from Manchester to Oakland Avenue. The buses will replace the one-man street cars heretofore used on this stretch during the Summer months when the Taylor Avenue division runs direct to Forest Park Highlands amusement park and the Zoo in Forest Park.

New Move in St. Paul Following Voters' Action

Voters at St. Paul, Minn., will have submitted to them for action at the election on May 1 a proposed charter amendment authorizing the city to engage in bus transportation. The draft of the amendment was voted unanimously for submission March 22 by members of the City Council. For passage the amendment must receive a favorable vote of 60 per cent of the ballots cast at the election. This action follows refusal of the voters at the last election to adopt an amendment allowing the City Council to vote expense relief suggested by the Minnesota Railroad & Warehouse Commission to enable the St. Paul City Railway to come nearer the 7½ per cent return on its valuation authorized by the commission. This included cost of paving between tracks where the streets are already paved. The company has before the commission application for an increased rate of fare, now 8 cents or six tokens for 40 cents.

New Interstate Bus Bill Introduced

Measure now before House represents legislation regarded as not too restrictive yet sufficiently protective

CONGRESSMAN PARKER, chairman of the House committee on interstate and foreign commerce, introduced on March 24 H.R. 12380 as a substitute for his bill H.R. 5640 and, with the consent of Mr. Denison, as a substitute for H.R. 19. This bill was introduced at the request of a legislative subcommittee of the bus division of the American Automobile Association which, under the instructions of the bus board and bus division legislative committee, has since Dec. 2, 1927, been negotiating with all the interests concerned in an attempt to get a bill satisfactory to everybody which would stand a good chance of passage at this session.

In the opinion of the bus board and legislative committee, H.R. 12380 represents more perfectly the viewpoint of the bus operators in the bus division than did the Denison bill, and, at the same time, it has the approval of the American Electric Railway Association, the American Association of Railway Executives, and, informally, pending an official meeting of its legislative committee, the approval of the National Association of Railroad and Utilities Commissioners. The bill also includes several recommendations which were made by the National Automobile Chamber of Commerce at meetings between representatives of that organization and the bus board in Washington on Nov. 11 and Dec. 2.

The chief changes in H.R. 12380 over Mr. Denison's bill are as follows:

1. The two classifications have been omitted and the term "motor carrier" redrafted to take care of this change.

2. The "grandfather" clause has been changed from March 3, 1925, to one year prior to the opening day of the legislative session at which the act is passed.

3. The provision for a suspension of rates during the time when hearings are being held on a protested rate has been omitted. The regulating agencies, under the terms of the act as now written, are without authority to suspend a rate pending the outcome of a controversey.

4. The different matters which under the old bill the board or commission was required to take into consideration before granting a certificate of convenience and necessity have been cut down to a statement that, among other pertinent matters, the board or commission shall give reasonable consideration to the public convenience of and necessity for the transportation proposed and to existing available transportation agencies and service.

These represent the major changes. The only other change to be noted is that the excess phraseology in the bill has been eliminated and where the Denison bill ran to 25 pages, H.R. 12380 runs to only 20 pages. In drafting the bill every effort was made to follow to the closest degree possible the recommendations which were made to the Interstate Commerce Commission at the time of the oral argument on the examiner's tentative report in docket No. 18,300, held at the commission's office on Feb. 10.

No definite information as to hearings on interstate legislation is forthcoming as yet except that whatever hearings are held will be on H.H. 12380 and will not involve anything directly or indirectly connected with motor truck transportation. In an informal statement made to representatives of the bus division on March 28, Mr. Parker said that he would do everything he possibly could to have the committee take early action and he thought that hearings might be held the first or second week in April. At least a week's notice of the date which the committee would set for hearings has been assured. An official statement says:

The bill as it now stands is simple in form and covers all the fundamentals of regulation. Everybody participating in the conferences at which the bill was drafted was agreed that the bus should be given every opportunity to develop along sound, healthful lines and, except for those provisions necessary for the protection of a certificate, no attempt was made by anybody to insert anything which could be construed as being at all restrictive.

Governor Signs New Jersey Bus Bill

Governor Moore of New Jersey has approved Senator Wolber's bill, senate 204, authorizing the substitution of buses for trolley cars, and extending the Public Utility Commission's control over corporations operating both railways and buses as one system. Under the terms of the bill it is announced many improvements in the transportation system of the Public Service are planned. One of the immediate changes is in West Hudson and Bergen County, where the Hackensack-Newark railway line, is to be turned into a bus line from Hackensack to Rutherford, while from Rutherford the present railway line is to be continued. There is already a de luxe bus line from Hackensack to Newark.

Consolidation Rumors in Albany

An unconfirmed rumor is afloat in Albany, N. Y., that plans are being negotiated for a consolidation of all existing bus lines radiating out of Albany. It is said that a bus corporation operating in the northern and central portion of the state and a railroad controlled corporation are both seeking to promote such a consolidation.

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Financial *and* Corporate

Canadian Park Property Passes to Electric Railway

The Canadian National Electric Railways has taken over the ownership of Eldorado Park served by the Toronto-Guelph line of the railway. Its former owners were a group of business men in Brampton and vicinity. The amount involved in the transfer has not been made known. It is stated that the park will be placed under the same management as the railway company's Lakeside Park at Port Dalhousie.

Eldorado Park has an area of 128 acres, and is looked upon as the choicest picnic property in the vicinity of Toronto. It is located upon the upper reaches of the Credit River, where nature has been generous in making that part of the country a delightful beauty spot. The most direct route to the park is over the railway's own line, but it is only a short distance from the Provincial highway running through Brampton.

The railway has under way a program of improvements to the park facilities, in order to bring it up to the same standard as the park at Port Dalhousie.

Mayor of Philadelphia Would Act to Condemn "Underliers"

Mayor Mackey of Philadelphia intends to start action on the McChord plan to untangle the city's transit problems by condemning Philadelphia Rapid Transit Company "underliers." Only a short time ago General Atterbury in a letter to the Mayor explained that elimination of the subsidiary companies would remove obstacles now in the way of developing the Pennsylvania Railroad terminal west of the Schuylkill.

Mr. Mackey says that he may ask the Public Service Commission to determine the value of the "underliers" in time to submit the question of their purchase to the voters in November. The McChord plan, he explains, calls for increasing the city's indebtedness to $136,000,000, but not for any increased charge against the city borrowing capacity.

St. Joseph and Benton Harbor in Sale Proposal

A proposal is under consideration by local business men to purchase and expand the railway in the twin cities of Benton Harbor and St. Joseph, Mich., now run by the Benton Harbor-St. Joseph Railway & Light Company. A committee of six has been named by the Benton Harbor Chamber of Commerce to analyze the proposal and report its recommendations.

The question came up recently when it was revealed that the American Gas & Electric Company, which owns the outstanding capital stock of the local company, contemplated the sale of the system. The American Gas & Electric Company is interested principally in gas and electric properties.

Receivership Case in Binghamton Still in Courts

Federal Judge Frank Cooper has received briefs in Albany on the motion entered by attorneys for the Chatham-Phenix National Bank & Trust Company, New York, in which permission was requested to foreclose and sell under a mortgage held against the Binghamton Railway, Binghamton, N. Y.

The Chatham-Phenix is trustee under the first mortgage of $500,000 by the railway. That company asks for extension of the present federal receivership of William H. Riley. It wants the proceeds of the receivership to be allocated so that $100,000 in interest overdue and accruing on the mortgage may be paid.

A brief has been filed in opposition on behalf of the Traders Trust Company, Binghamton, trustee under the general consolidated mortgage of 1901, under which the receivership now stands.

Another hearing is scheduled to be held on April 5 before Special Master Roy C. McHenry, who will report to Judge Cooper.

Cincinnati Street Railway Doing Well

More passengers being carried. Surplus of $172,765 from railway operation, but loss on coaches. Interesting comment by President Draper

OPERATION of the Cincinnati Street Railway, Cincinnati, Ohio, for the year resulted in an increase in the number of passengers carried and a slight increase in the actual surplus over all expenses, taxes and charges. The surplus would have been greater had it not been that a larger amount than had been anticipated or required to be accrued into the special depreciation reserve fund, was expended to take care of track reconstruction. Part of this was charged as an operating expense. Walter A. Draper, president of the company, said:

The test of the successful operation of the Cincinnati street railway under the service-at-cost plan is the amount of money that is paid into or withdrawn from the fare control fund. In the last two months of 1925, following the date when the new franchise went into effect there was paid into the fare control fund in the way of surplus earnings $6,775. In the year 1926 the amount was $14,064, while in the year 1927 the amount was $20,339. The initial amount paid into the fare control fund when the new operations started was $400,000, provided from the sale of securities, which has been increased to $441,177 by the amount added in the 26 months of operation.

These small additions in themselves indicate, under the service-at-cost plan, that the rate of fare is almost exactly the right figure to provide for all of the requirements for the proper operation of the property. A total deficiency in an equal sum for the period mentioned would indicate the same thing. The fare control fund is provided as a reservoir into which small surpluses and out of which small deficits shall be paid so as to avoid too frequent changes in the rate of fare. It will be recalled that if the surplus should increase the fare control fund to $600,000 fares would be reduced, and, likewise, if deficits should be paid out of the fare control fund so as to reduce it to $200,000 fares would have to be raised. The rate of return to stockholders is fixed under this plan. Instead of the piling up of a large surplus as a proof of sound financial condition, the fare control fund and possible increases or decreases in the rate of fare provide the stability and protection that a corporation must have in order to have good credit and realize successful operation.

Two Full Years Under New Operation

The Cincinnati Street Railway has completed two full years of operation under the new plan and at the rate of fare that went into effect on Nov. 1, 1925, of 8⅓ cents for tickets and 10 cents cash. It is possible therefore to present a statement showing the results of operation for the two years that are fairly comparable, being on the basis of the same corporate and financial structure and the same conditions of operation with two exceptions; first, the property of The Cincinnati & Hamilton Traction Company was operated under lease as part of the system to April 1, 1926, at which date it was purchased and made an integral part of the property; and second, the company began the operation of motor coaches in April, 1926, having no operations of that character prior to that date.

The results of operation of Cincinnati Street Railway including cars and coaches follow:

	1927	1926
Operating revenue	$8,700,257	$8,065,296
Operating expenses	6,332,429	5,846,221
Net operating revenue	$2,367,827	$2,219,074
Taxes	771,369	708,831
Operating income	$1,596,458	$1,510,242
Non-operating income	48,021	37,220
Gross income	$1,644,480	$1,547,463
Rental, interest, sinking fund and return on capital	1,624,140	1,533,399
Balance	$20,339	$14,064
Fare control found previous balance, including initial $400,000	420,837	406,733
Total in fare control fund.	$441,177	$420,797

A separation of this statement between cars and motor coaches would

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STATEMENT OF PASSENGERS CARRIED BY CINCINNATI STREET RAILWAY

	1927	1926	1925	1924	1923	1922	1921
Revenue Passengers:							
Cars	94,006,310	89,493,159	90,629,875	100,839,343	108,625,599	107,528,666	106,527,759
Coaches	6,816,139	4,104,586	.....	.....	.....	.....	.....
Total revenue passengers	100,822,449	93,597,745	90,629,875	100,839,343	108,625,599	107,528,666	106,527,759
Transfer Passengers:							
Cars	30,221,784	29,480,811	30,832,130	32,706,502	34,066,858	34,765,044	34,904,917
Coaches	1,390,784	768,711	.....	.....	.....	.....	.....
Free Passengers:							
Cars	1,553,513	1,465,801	1,309,845	1,319,318	1,292,290	1,399,018	1,527,297
Total, all passengers	133,988,530	125,313,068	122,771,850	134,865,163	143,984,747	143,692,728	142,959,973

show that the operation of the former resulted in a considerable surplus while in the case of coaches a loss was sustained. The surplus from car operation was $172,765, and the loss from coaches was $152,426, the combined statement therefore showing a surplus of $20,339. Mr. Draper explains that as long as coaches are used to serve remote and thinly populated parts of the city they may be expected to show a loss, but it is encouraging that this loss has been reduced in the latter part of the year and promises further improvement.

One of the provisions of the franchise under which the company operates is that on Dec. 1 of each year there must be filed with the city an estimate of gross receipts and budget of operating expenses, taxes, fixed charges and return on capital for the ensuing calendar year. The estimate for the year 1927, which was filed on Dec. 1, 1926, was closely realized by the actual results, as the actual operating revenue for the 12 months was $8,700,257 or $37,000 over the estimate, while the surplus after paying all requirements for the year was $20,339 or $8,712 in excess of the estimate.

Included in revenue passengers carried are those riding on the Sunday pass, which has now been in use for more than a year. The number of Sunday passes sold during the year was 556,736, which were used for a total of 3,450,344 rides. The Sunday pass is sold for 25 cents and is good for as many rides as the times it is presented by the holder on cars of the system between the hours of 5 a.m. and midnight on the same day sold. No transfers are issued on the Sunday pass, hence each time it is presented for fare it is recorded as a ride.

$1,209,453 Spent on Track

In no department was there greater activity in 1927 than in the roadway department. The program of track reconstruction, as distinguished from ordinary maintenance and repairs, included 33 major locations and involved an expenditure of $1,209,453, of which $936,753, was chargeable to operating expense as renewals and replacements and $272,700 to additions and betterments as adding to the value of the property through the installation of heavier foundation and rails and steel ties in place of the previously constructed lighter track. This was almost twice the amount expended the previous year and much in excess of the amount anticipated to be done in any one year when operations were undertaken under the new franchise. This measure required the company to charge to a special depreciation reserve fund over a period of 50 months a total sum of $1,750,000 for track reconstruction. It was early seen, however, that it would be to the advantage of the city as well as the patrons of the system if the work were speeded up sufficiently to correspond more nearly with the program for street improvements by the city.

Expenditures on Obsolete Equipment Unwise

On the subject of cars Mr. Draper said:

It has been the policy of the company to put the track in good operating condition before proceeding with the purchase and operation of new cars. The point has now been reached where new cars can fit into the rehabilitation program and the company will shortly be prepared to place a contract for the construction of from 50 to 100 new cars, delivery of which is expected to be made during the summer. The present equipment operated by the company has been improved in many ways, but the expenditure of additional money on obsolete equipment should be abandoned in favor of the purchase of entirely new rolling stock.

Employees Play Their Part Well

More and more it is being realized by all of the employees of the company that we are all part of one big family and that our interests are mutual and our welfare interdependent. Probably nothing has served to emphasize this more than the starting of a company publication called the *Cincinnati Street Railway News* devoted to the interest and the welfare of this big group of railway people.

The courtesy shown by the company employees toward the car-riding public is increasingly commented upon and many responsive echoes from individuals are received in the shape of commendatory letters. Complaints there are, naturally, where 1,500 men come in daily contact with 400,000 people, but in every such case an effort is made either to make amends, to correct or to explain, and above all, to show the complainant that the company is desirous of learning of every incident that should have attention.

The statement of additions and betterments made to the Cincinnati property during 1927 follows:

Way and structures		$272,700
Real estate for loops		40,442
Winton shops, real estate and buildings		792,084
Sub-station real estate and buildings		141,955
Automotive equipment		35,758
Shop equipment (tools)		8,434
Remodeling cars into prepayment type		15,158
Miscellaneous		36,083
Total cars		$1,342,617
Motor coaches	$78,185	
Coach, shop and service equipment	12,266	
Total coaches		90,452
		$1,433,070

The building up of the capitalization of the company or capital value from the date when the present plan of operation went into effect is shown by the following table:

Capital Stock		
Outstanding Nov. 1, 1925	$22,761,950	
Issued to buy Cincinnati and Hamilton property	1,000,000	
Total		$23,761,950
5½ per cent gold bonds		7,000,000
Car trust notes		512,500
Additions and betterments to Dec. 31, 1927	$2,403,369	
Funded	2,181,950	
Unfunded additions and betterments provided by company funds		221,419
Total capital value Dec. 31, 1927		$31,495,869

On the subject of the bus Mr. Draper said in part:

The officers of your company are of the opinion that the motor coach is a type of transportation which fits in logically with rail operation. It is good sense for railway systems to utilize the motor coach where it can best serve different communities, and also to use it in experimentation to determine how it may best fit in. As yet it would appear that mass transportation, particularly in large cities, can best be handled by the familiar form of street cars improved and developed to meet the special needs. The field of the motor coach has heretofore been limited by the size of the units available. There has now been developed a new motor-coach unit of greater carrying capacity which must be reckoned with and which may cause street railway operators to change their opinion as to the availability of the motor coach for use in city transportation. It is wise, therefore, to consider all the possibilities of the motor coach in connection with any future extension that the company may be called upon to make by the growing community.

On the matter of the rapid transit line and other subjects the report says, in part:

The report of the Beeler organization, employed jointly by the city and the company to make a survey of the rapid transit line situation, has been completed. An analysis and study of the Beeler report is now being made in order that the company may be in a position to undertake intelligently the discussion of what had best be done with this important enterprise. The position of the company is that if the Rapid Transit Line can be operated as a part of the local transportation system with the reasonable certainty that the operating costs and taxes, together with all of the fixed charges and return on capital of the present system can be met, it is willing to undertake its operation on a basis that will insure this result as far as possible. A committee has been authorized by Council to sit with the Rapid Transit Commission in the discussion with the company of this important matter. Mutual interest of city and company in retaining the integrity and increasing the efficiency of the existing transportation system (which will have to continue to serve by far the greater majority of the people) should leave little room

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for disagreement as to the principal terms and conditions of operation.

It has been the endeavor of the officials of the company to co-operate with the city administration in every way and, in return, fair treatment and unprejudiced consideration has been accorded by the Mayor and other members of Council, the City Manager, the Director of Public Utilities and all city officials with whom the company is brought in contact.

When the franchise under which the company is operating went into effect on Nov. 1, 1925, the annual return to stockholders was reduced from the former rate of 6 per cent to 5 per cent for a period of three years. The allowance to the company for dividend payments to its stockholders will consequently continue at the rate of 5 per cent until Nov. 1, 1928, when the amount of the allowance will return to that which will allow the payment of 6 per cent. Some stockholders have felt that this temporary reduction in the return on capital has been a hardship that they should not have been called upon to suffer. However, the purpose was to help to provide funds for putting the property in a better condition than that in which it was found as the result of the four years of negotiation. It is a wise thing for directors properly to maintain the property in their charge. While a larger return on capital than 6 per cent has been allowed to public utilities in many rate cases before courts and commission, it must be kept in mind by stockholders that to offset this limited return and the control exercised by the city there is provided in our case a fair and equitable means for insuring this return, which is as far as the municipality could go toward making the return safe and secure.

In a year of rehabilitation, development, experimentation and adaptation to new conditions, the officials of the company have worked steadily and enthusiastically to accomplish the task that was so clearly set before them. Likewise, the directors of the company have been patient and interested in hearing the many problems presented to them and thoughtful and considerate in advice as to how they should be solved. To directors and officials and also to the rank and file of employees my thanks and appreciation are cordially extended.

Although this may not be a proper place in which to do so, I desire to express appreciation to the newspaper men of Cincinnati who have been so thoroughly interested in our endeavors to improve the transportation system, and also express a full measure of gratitude to all citizens generally who have helped in greater or less degree by their praise and advice and criticism, and even their complaints, and most of all to the hundreds of thousands who have shown an increasing confidence in the ability of the company to serve them by their increased patronage of cars and motor coaches.

New Chairman in Baltimore

At a meeting of the stockholders of the Washington, Baltimore & Annapolis Electric Railroad, held in Baltimore on March 26, Herbert A. Wagner was elected chairman of the board. He succeeds George T. Bishop, Cleveland, who resigned from the board some time ago. Mr. Wagner is president of the Consolidated Gas, Electric Light & Power Company, Baltimore, which controls the electric railroad and its subsidiaries through a holding company.

Economy and Efficiency Help Boston Elevated

Operation of the Boston Elevated Railway, Boston, Mass., during the last eight years has been set forth for study in parallel columns giving a few vital operating statistics for the two years 1920 and 1927.

Thirty-one million more people used the "El" in 1927 than in 1920, and the average fare per revenue passenger decreased from 9.868 to 9.266 cents. It is also disclosed that 5,500,000 more miles and 1,500,000 more round trips were operated in 1927, and as a result the number of revenue passengers carried per mile decreased from 6.548 to 6.457.

Without the economies which have been effected, the wage increases awarded during the eight-year period would have placed a burden of $4,000,000 on the car riders. Fixed charges (taxes, rent of leased roads, dividends, subway and tunnel rents, interest on bonds and notes) have increased by $1,250,000 in this period.

Notwithstanding the wage and fixed charge burdens, the actual payroll was $459,107 less in 1927 than in 1920 and operating expenses as a whole were $636,789 less than in 1920.

If operating expenses in 1927 had taken the same percentage of passenger revenue as in 1920 there would have been a deficit in 1927 of $1,293,668 instead of a surplus of $222,000.

AN EIGHT-YEAR COMPARISON OF BOSTON ELEVATED RAILWAY

	1920	1927	Increase	Decrease
Revenue passengers, 5-cent fare	8,952,577	8,534,666	.....	417,911
Revenue passengers, 6-cent and 6½-cent fare	.....	58,890,542	58,890,542	.....
Revenue passengers, 10-cent fare	326,496,184	299,340,854	.....	27,155,330
Special car and bus passengers	77,800	172,846	95,046	.....
Total	335,526,561	366,938,908	31,412,347	.....
Average fare per revenue passenger, cents	9.868	9.266	.....	0.602
Wages—Amalgamated and Craft employees	$14,040,747	*$18,045,550	*$4,004,803	.....
Actual total wage cost	$17,216,445	$16,757,338	.....	$459,107
Average employees on payroll	9,628	8,607	.....	1,021
Gross revenue	$34,031,636	$35,193,410	$1,161,774	.....
Fixed charges (taxes, rent of leased roads, dividends, subway and tunnel rents, interest on bonds and notes) and miscellaneous items	$8,609,681	$9,838,261	$1,228,580	.....
Operating expenses	$25,769,122	$25,132,333	.....	$636,789
Ratio of operating expenses to gross revenue, in per cent	75.721	71.412	.....	4.309
Revenue-mileage	51,237,527	56,827,962	5,590,435	.....
Round trips operated	5,764,347	7,295,371	1,531,024	.....
Car defects per 10,000 car-miles	13.4	3.8	.....	9.6
Revenue passengers per mile	6.548	6.457	.....	0.091
20-minute delays in service	885	500	.....	385

*Based on hours and rates of 1920.

If operating expenses in 1927 had taken the same percentage of gross revenue as in 1920, they would have been greater by $1,516,484, and there would have been a deficit for the year of $1,293,668.

Nothing in Ottawa Situation to Cause Alarm

Shareholders of Ottawa Traction Company, Ottawa, Ontario, are in receipt of a circular letter, signed by President Thomas Ahearn, setting forth the reasons for the concellation of the quarterly dividend of 1 per cent, payable ordinarily on April 2 next. The letter reads as follows:

Your directors regret very much the necessity of informing you that the reserve fund of the Ottawa Electric Railway, which has been used for the purpose of dividends for the past four years, is exhausted and that it is, therefore, necessary to suspend payment of dividends until the earnings of the company prove sufficient to warrant a resumption of payment.

You are of course aware that the application of that company for increased fares is now before the Board of Railway Commissioners for Canada, and your directors have every confidence in the merits of the application.

Your directors feel very strongly that there is nothing in the present situation to occasion any feeling of alarm in the minds of the shareholders. They themselves and other large shareholders who have made a study of the situation feel quite satisfied that the position of the company is inherently sound and that the present difficulty is that the company has for some years been selling transportation at a price too low. Ottawa will always need the street cars, and the Ottawa Electric Railway will always be able to provide transportation at a rate which will justify people in using its system.

Local Ownership the Aim in Worcester

For the first time since the New York, New Haven & Hartford Railroad resumed control of the Worcester Consolidated Street Railway, Worcester, Mass., it has been revealed that the ultimate aim of the railroad officials is to have the road become the property of Worcester investors, once it has been thoroughly rehabilitated and put on a sound basis.

Edward G. Buckland, vice-president and general counsel, says it is now the hope of the New Haven to return to the city the management of its trolleys in order that the railroad can concentrate its attention on the steam road properties. Mr. Buckland is confident the Worcester line can be made to pay. He explains that the New Haven road is getting things into shape in the hope that in the not too distant future it can entertain offers for the property.

Since reassuming control of the Worcester line in 1926 the New Haven has spent more than $1,000,000 in a rehabilitation program. This covers only part of the work to be done. Mr. Buckland says the New Haven has no prospective customer in view for the purchase of the Worcester road. When the road is placed on a paying basis it

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will be ready to entertain propositions and Mr. Buckland believes that if it is earning 6 per cent on the investment there will be no dearth of purchasers. He is quoted as follows:

We would prefer to sell to Worcester interests. It is our belief that an electric railway should be locally owned just as much as an electric light company or a gas company. However, we are not idealists. If an attractive offer was received from a large utility operating company we would consider it carefully.

Preferred Dividend Passed by Tri-City Company

The Tri-City Railway & Light Company, Davenport, Ia., has passed the preferred dividend due on April 1, this year. The last payment was 1½ per cent, made on Jan. 2.

Richard Schaddelee, president of the United Light & Power Company, and a director of the Tri-City Company, said recently:

Under present conditions the operation of the railway systems in the tri-cities is producing barely enough to pay the straight operations costs, plus the taxes, without earning a cent for depreciation.

The situation is growing steadily worse and we have racked our heads for a solution, without being able to find one.

First Dividend on St. Louis Public Service Preferred

The first quarterly dividend of the St. Louis Public Service Company, St. Louis, Mo., has been declared on the preferred stock of the company. It is payable on April 1 to stockholders of record of March 20. The company has outstanding a total of 70,620 shares of preferred stock, of which 16,212 shares were allotted to the city, 53,845 shares to former St. Louis Transit Company bondholders and 553 shares to various other creditors of the United Railways, which the St. Louis Public Service succeeded after foreclosure and sale.

Financial Condition of Southern Michigan Divulged

The Southern Michigan Railway, operating from South Bend, Ind., to Benton Harbor, Mich., which went into receivership in Grand Rapids on Feb. 10, owes corporation income taxes and interest totaling $25,411 in Indiana, according to a statement received from George L. Foote, Indiana collector of internal revenue. The company owns tracks from the northern city limits of South Bend to the state line and the worth of the property is estimated at $2,000,000. The Chicago, South Bend & Northern Indiana Railway, which owns the Southern Michigan stock, operates railway service to St. Mary's over the Southern Michigan line. It is serving as receiver pending the outcome of proceedings in the Michigan Federal Court. The Northern Indiana line itself is under R. R. Smith, general manager, as receiver.

Personal Items

Changes in Buffalo

T. E. Mitten resigns from International Board. Messrs Lesswing, Sherman and Koch represent employees

AT THE annual stockholders' meeting of the International Railway, Buffalo, N. Y., held March 27, T. E. Mitten resigned from the board, on which he has served since 1920. This enables the employees to have three representatives instead of two. The following directors were selected to serve for a period of one year: A. A. Mitten, chairman; J. A. Queeney, vice-chairman; C. J. Joyce, W. K. Myers, Nelson Robinson, B. J. Yungbluth, H. P. Lesswing, M. H. Sherman and R. W. Koch.

The employee representatives on the board are: H. P. Lesswing and M. H. Sherman, president and vice-president of the employees Co-operative Association; and R. W. Koch, chairman of the general committee of employees under the Mitten plan. The board of directors thus consists of nine men, three of whom directly represent the employees, who are substantial owners of International Railway system. W. K. Myers, who is financial vice-president of Mitten Management, Inc., succeeds H. G. Tulley, former president of the International Railway and now vice-president of Mitten Management in charge of industrial relations.

Mr. Mitten To Give More Time to Banking

The meeting of the new board of directors was held immediately following the annual stockholders' meeting. A. A. Mitten was elected to succeed his father as chairman of the board, and J. A. Queeney, vice-chairman. Mr. Queeney continues as chairman of the executive committee whose membership also includes A. A. Mitten, W. K. Myers and B. J. Yungbluth. The board of directors elected the following officers of I.R.C. B. J. Yungbluth, president and general manager; N. T. Brown, vice-president of transportation; C. A. Weber, secretary and treasurer; and C. A. Chavel, auditor.

The resignation of Mr. Mitten from the board of the International Railway follows closely his resignation from the board of the Philadelphia Rapid Transit Company, and is in line with his announced intention to relinquish active operation of the Mitten properties to the younger men whom he has trained to succeed him. In this way he can devote his entire time to Mitten Bank and the Mitten Bank Securities Corporation, through which he plans to advance still more widely the principle of democracy in industry.

Dr. A. A. Mitten is the only son of T. E. Mitten. He is well known in Buffalo, having lived for some time in Lockport and having graduated from the University of Buffalo. He has served for several years as vice-president of Mitten Management, Inc., which operates International Railway property, the Philadelphia Rapid Transit Company, the Yellow Cab Company of Philadelphia, the Yellow Cab Company of Atlantic City and associated enterprises. He is vice-president of Mitten Men and Management Bank and Trust Company and also a vice-president of the new Mitten Bank Securities Corporation. Dr. Mitten was educated as a physician and surgeon. His first connection with the electric railway industry was in 1915 when he became industrial surgeon in Milwaukee. When the United States entered the World War Dr. Mitten went to France as a captain of an ambulance company. When he returned to this country he became very much interested in the far-reaching demonstration of industrial democracy which his father was developing in Philadelphia.

Dr. Mitten's personality makes him eminently well qualified to establish and maintain the intimate contacts between men and management which are so essential to the Mitten plan for industrial democracy. He is as much at ease with a track employee as he is with one of the officials of the company and the interesting thing about it is that the track employee will be equally at ease with Dr. Mitten.

Mr. Lesswing has been continually in the employ of the International Railway since May 7, 1917. He is 28 years old and is employed as an electrician in the power department.

Mr. Sherman has spent 6 years in the service of the International Railway and is an operator working out of Broadway station.

Mr. Koch was employed on April 15, 1909 and is a substation operator in the electrical department. He is 37 years old.

Charles Fields and Otto Schultz Newly Assigned in New Jersey

Charles Fields has been appointed manager of the new Morris division of the Public Service Railway, Newark, N. J., and Otto G. Schultz has been assigned, reporting to Matthew R. Boylan vice-president in charge of operation, co-ordinated transport.

Mr. Fields started his career in the transportation business as conductor with the Brooklyn Rapid Transit Company in 1905. In 1907 he accepted a position as inspector with the New York & Queens County Railway, being subsequently promoted to chief inspector. In 1913 he became superintendent of the Binghamton Railway Company, Binghamton, N. Y. He left the employ of this company in 1917, to engage in special transportation work for Stone & Webster, and the J. G. White Management Company. In 1923 Mr. Fields was transferred to the

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Morris County Traction Company as general superintendent.

Mr. Schultz has been associated with the Morris County Traction Company since December, 1909, and has held the position of manager and treasurer during that time.

Messrs. Gunn and Francis Advanced in San Francisco

Two more employees of the Market Street Railway, San Francisco, Cal., who began their railroad experience on the platforms of the cars in that city, have stepped into executive positions. They are Byron F. Gunn, who has become superintendent of the Geneva division, and A. E. Francis, who succeeds him in the post of superintendent of ferry terminals.

Mr. Gunn entered the service of the company Jan. 27, 1909, as a conductor at the Kentucky division. He was appointed starter at Third and Townsend Streets station Oct. 14, 1914. Here he distinguished himself for his handling of thousands of commuters and in dealing with emergency situations such as arise around terminals. From May 1, 1927, he has served as superintendent of ferry terminals.

Inspector A. E. Francis succeeds Mr. Gunn as superintendent of ferry terminals. Mr. Francis entered the service on Dec. 11, 1907. His appointment as inspector came on Nov. 22, 1910. He served as relief inspector, thus familiarizing himself with the entire system in San Francisco and meeting thousands of people.

H. J. MARTIN has been promoted to the position of safety inspector of the New York State Railways, covering all Rochester, N. Y., city lines, including the co-ordinated buses. Mr. Martin began his railway career twenty years ago in Manchester, England, where he operated both as a motorman and conductor. He served in Hamilton, Ont., going to Rochester as a conductor in 1921. Later he was made inspector on the Rochester lines. In addition to his other duties Inspector Martin teaches in the school of instruction, aids in the investigation of accidents and makes special investigations of safety suggestions.

W. F. BURDELL was elected assistant secretary and assistant treasurer at a recent meeting of the stockholders of the Scioto Valley Railway & Power Company, Columbus, Ohio.

F. S. SHEFFIELD, formerly chief instructor for the Eastern Texas Electric Company, Beaumont, Tex., has been appointed assistant superintendent of transportation. He will report to O. W. Gaines, who, in addition to his work of superintendent of transportation in Beaumont, has similar duties in Port Arthur. The property in the latter city was recently purchased by the Eastern Texas Electric Company as told in ELECTRIC RAILWAY JOURNAL.

FRANK MILHOLLAND, chairman of the North Dakota Railroad Commission, will resign from that position April 1 to become president and general manager of the Central West Public Service Company with headquarters in Omaha, Neb. The Central West Public Service Company properties serve 29 cities and towns in Iowa, Nebraska, Minnesota, South Dakota and North Dakota with electricity, telephones, gas and water.

Obituary

Edwin E. Downs

Edwin E. Downs, superintendent of railway revenues of the Winnipeg Electric Company, Winnipeg, Canada, died in Winnipeg on March 17. Mr. Downs was well known throughout the electric railway industry, which he had served for about 35 years.

His first business experience was in general contracting and telephone work. With the introduction of electricity for use on city and other railways he became connected with the construction department of the Thomson-Houston Company and had charge of installing electricity on the Second Avenue Passengers' Railway, Pittsburgh, Pa., the first railway in Pittsburgh to adopt electricity. Later he installed electricity on the Missouri Street Railway, St. Louis, Mo.; City Electric Railway, Little Rock, Ark.; Fort Clark Street Railway, Peoria, Ill., and the Fort Wayne & Belle Isle Railway, Detroit, Mich. In his work at Little Rock Mr. Downs was associated with Bion J. Arnold.

Subsequently Mr. Downs became manager of the railways in Kalamazoo and Battle Creek, Mich., for the General Electric Company.

Mr. Downs assisted in constructing an electric railway between Anderson and Marion, Ind., and in 1907 was engaged by George J. Kobush, St. Louis, Mo., as general manager of the Winnebago Traction Company, Oshkosh, Wis., with which company he remained for more than seven years. In October, 1904, Mr. Downs went to San Francisco in the interests of E. H. Rollins & Sons, Boston, Mass., as general manager of the Petaluma & Santa Rosa Railway. In March, 1908, he succeeded E. R. Kirk as general manager of the Sterling, Dixon & Eastern Electric Railway. Two years later he was appointed general manager of the Chicago & Milwaukee Electric Railway and later moved to Winnipeg to take the position with his old working comrade, President A. W. McLimont, as superintendent of railway revenues.

WILLIAM F. M. Goss, formerly dean of the College of Engineering at the University of Illinois and president of the Railway Car Manufacturers' Association for ten years, died on March 23 at the Waldorf-Astoria Hotel, New York. Dr. Goss is probably best known to the electrical industry for his work as a member and later as chief engineer of the Chicago Association of Commerce committee on smoke nuisance and the electrification of railroad terminals in Chicago. In the course of his academic career he organized the department of practical mechanics at Purdue University, with which institution he was connected for seventeen years, being dean of the engineering school for a large portion of that time. In 1907 he became dean of the College of Engineering of the University of Illinois, but ten years later he severed his connection with that faculty to take up the duties of president of the Railway Car Manufacturers' Association. Dr. Goss was active in association work, having been a past-president of the American Society of Mechanical Engineers, a fellow of the American Association for the Advancement of Science, a member of the Society for the Promotion of Engineering Education and of other engineering associations. Dr. Goss was a native of Massachusetts and a graduate of the Massachusetts Institute of Technology. He was 69 years old.

T. R. BRISTOL, assistant superintendent of equipment, Georgia Power Company, Atlanta, Ga., died March 9. Mr. Bristol served his apprenticeship as a young man with the Santa Fe System. Then he served the Westinghouse Traction Brake Company for a number of years. He saw service in France with the railway engineers and after the war he resumed his duties with the Westinghouse Traction Brake Company, being stationed in Atlanta as mechanical expert. Mr. Bristol became affiliated with the Georgia Power Company in September, 1921. He was well known throughout the Southeast, which was the territory he traveled for the Westinghouse Traction Brake Company and also through his activities in the Electric Railway Association of Equipment Men, Southern Properties. Mr. Bristol was in his 32nd year.

PETER J. METZDORF, assistant to the vice-president of the Twin City Rapid Transit Company, Minneapolis, Minn., died recently. After a term of service as supplies salesman, manager of outdoor amusement enterprises and pavilions in St. Paul and county treasurer, 21 years ago he first became a member of the staff of the Twin City Rapid Transit Company, as chief clerk. Later he looked after other enterprises of the Twin City Rapid Transit Company and managed other electric railway recreational projects.

PHILIP MATTER, a director of the Indiana Union Traction Company, Anderson, Ind., and one of the principal stockholders of the company, died recently at his home in Marion, Ind., following a few days' illness resulting from a fall. He settled in Indiana in Civil War days. His judgment was sought in many business transactions and his advice aided many Marion men to build and increase their fortunes. He is survived by three sons and three daughters. Mr. Matter was 85 years old.

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Manufactures and the Markets

General Electric Annual Report

The net profit of the General Electric Company for 1927 amounted to $48,799,489, after interest, depreciation and taxes. This was equal after dividends on the special stock to $6.41 a share earned on 7,211,481 no par common shares. It compared with $46,672,499, or $6.14 a share, earned in 1926.

Orders received during the year amounted to $309,784,623, against $327,400,207 in 1926, a decrease of 5 per cent. Unfilled orders at the close of 1927 were $68,916,000, against $72,297,000 at the close of 1926, also a decrease of 5 per cent. Net sales billed during the year were $312,603,772, against $326,974,104 in 1926.

Inventories, after reserves, were $67,213,705 at the end of 1927, against $65,295,154 the year before. At the close of 1920 inventories amounted to $118,109,173 and shipments were $275,758,487, the ratio of inventories to shipments being 42.8 per cent. At the close of 1927 the ratio was 21.5 per cent, or a turnover nearly double that of 1920. An increase of 13 per cent in shipments billed was accomplished, while the capital locked up in inventories was reduced to $50,895,000.

Uruguay Asks Bids For Oil-Electric Units

Bids are now being sought by the Administración de los Ferrocarriles y Tranvías del Estado covering construction of two gas-electric generating units to be installed in two of the Unicars which were bought some time ago by the Uruguayan Government. Copies of the call for bids will be lent to interested firms upon request to the Department of Commerce, Bureau of Foreign and Domestic Commerce, Washington, D. C., referring to No. EE 1069. The closing date for bids is 11 a.m., June 1, 1928.

Business of Austin Company Very Active

Unusual building activity in the Cleveland territory is reported by the Austin Company, well known national builders, with headquarters in Cleveland. More than a dozen of the 100 building projects which this firm has under way from coast to coast are located in Greater Cleveland alone; among them is a large garage and service station, for the Cleveland Railway, costing about $200,000, with three stories and basement 100x125 ft. in size.

Austin's 1928 business is starting with a volume that bids fair to make the year even better than 1927, which was the most successful in the company's history.

The Austin Company is expanding its own facilities to meet this greatly increased demand. At its main office, corner Euclid and Noble Road, ground has been broken for a large two-story and basement addition to the office building. Greater facilities for the engineering department and general office use are being provided at a cost of more than $50,000.

At Bliss Mill, Austin's steel fabricating plant, in Euclid, Ohio, provision is being made now for the construction of an entire new woodworking shop to replace the cramped quarters at its present location on East 152nd Street, opposite the Jordan Motor Company plant. This move will result in the mobilization of all Austin service facilities at Bliss Mill, where the steel fabricating plant has been located for several years. Austin is the largest fabricator of structural building steel in the Cleveland territory.

Spanish Railway Improvements

Plans for the expenditure of 1,433,670,000 pesetas for improvements in the rail systems of Spain were approved at a recent meeting of the Supreme Railway Council. Of this amount 160,980,000 pesetas has been allotted for improvement of the electric service. A peseta is approximately 17.1 cents.

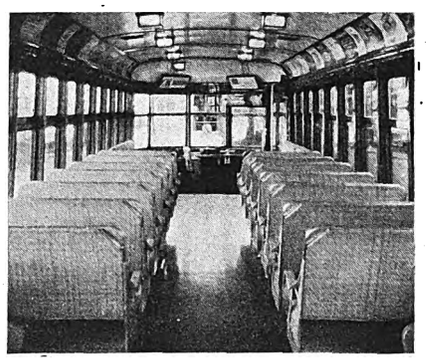
New Twin City Cars in Operation

The Twin City Rapid Transit Company, Minneapolis, Minn., has put in operation 25 new street cars. The cars are of the light-weight, noiseless type built in the Snelling shops of the company.

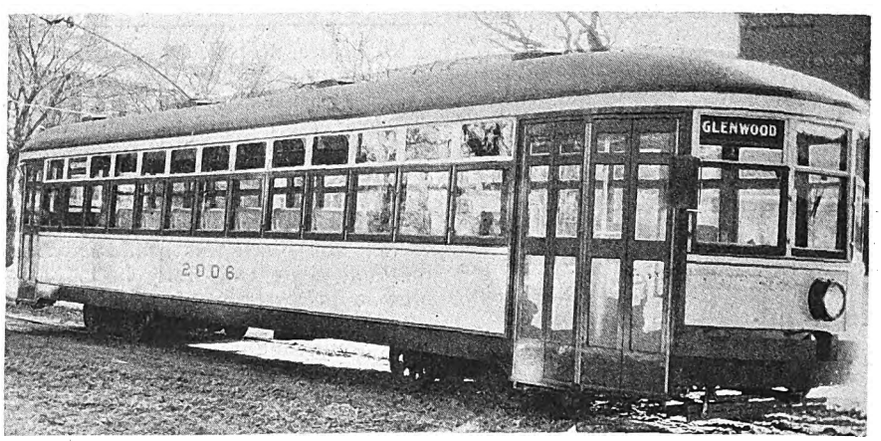
The car body is built on a steel and duralumin frame weighing 4,230 lb. In addition to this metal frame, the car has a complete frame of white oak. The ceiling, roof and sides of the car are plywood and the vestibule linings are plymetl. The floor is double and well insulated and the inside finish is mahogany with a white ceiling.

The trucks are each equipped with 56 coil and elliptic springs and a swinging spring plank giving a perfect graduation of the load and eliminating vibration.

With this car having a normal load, it is possible to reach a speed of 21 m.p.h. and to come to a stop within 600 ft. in 26 seconds.



The interiors of these cars are in mahogany finish with a white ceiling. They are well lighted and ventilated



One of the light-weight, noiseless type cars put in operation by the Twin City Rapid Transit Company

Name of railway	Twin City Rapid Transit Company
City and state	Minneapolis, Minn.
Number of units	25
Type of unit	one-man, two-man, double-end
Number of seats	50
Weights:	
Car body and equipment	17,983 lb.
Trucks	6,980 lb.
Total	24,963 lb.
Length over all	45 ft. 6 in.
Truck wheelbase	4 ft. 6 in.
Width over all	9 ft. 0 in.
Body	Semi steel
Doors	End
Air brakes	G. E. Concentric Clasp
Armature bearings	Roller
Axles	Tubular
Compressors	G. E.
Control	G. E.
Door mechanism	National Pneumatic
Doors	Folding
Fare boxes	Johnson
Hand brakes	Peacock
Headlights	Ohio Brass
Interior trim	Wood-trim mahogany with aluminum metal trim
Journal bearings	Hyatt roller
Motors	G. E. No. 4
Roof material	Plywood
Seats	Rattan
Wheels, type	Steel, oil tempered, diameter 26 in.

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Philadelphia Station Control Contracts to Be Let

The contract for station control and miscellaneous equipment is one of the most important awards on the Broad Street Subway yet to be let by the Department of City Transit, Philadelphia, Pa. It provides for furnishing and installing in the fourteen subway stations fencing, railings, gates, grills, handrails, baggage boards, signs, ticket booths, passimeters and turnstiles. Railings are to be constructed around the upper track levels, guard plates for emergency exit doors are to be placed in the sidewalk ventilator gratings, signs are to be placed along the tracks and in the emergency exits, and bent numbers are to be stenciled on the subway walls and columns. The specifications also provide that ticket booths shall be installed on mezzanine floors in express stations and on the platforms of local stations. There will be two types of ticket booths—the side control booth and the end control booth.

New Type Electric Locomotives for South Africa

Seventeen bids have been received in South Africa for an experimental type of electric locomotive for use on the Natal electrified system. This locomotive is to be three times as powerful as any of the units now employed on the South African Railway. Future orders for any number of locomotives up to 100 depend on the success of this experiment.

ROLLING STOCK

FITCHBURG & LEOMINSTER STREET RAILWAY, Fitchburg, Mass., has ordered five 21-passenger street car type Studebaker buses from the Studebaker Corporation of America, South Bend, Ind.

PUBLIC SERVICE CO-ORDINATED TRANSPORT, Newark, N. J., has received the first shipment of bus chasis on order of 331 gas-electric chassis recently placed with the Yellow Truck & Coach Manufacturing Company. Three chassis a day will be turned out up to April 15, and five a day thereafter, until the order is completed.

DETROIT MUNICIPAL RAILWAY, Detroit, Mich., will do nothing more about the purchase of additional buses, on which bids were recently received, until the results are made known of a survey of bus operation to be made by W. B. Mayor at the suggestion of the Street Railway Commission.

TRACK AND LINE

INTERNATIONAL RAILWAY, Buffalo, N. Y., is planning to co-operate with the city in repaving and rebuilding streets over which its local traction lines operate. One of the first major improvements planned by the railway is the rebuilding of part of its William Street line to handle the heavy traffic which will result with the opening of the new passenger terminal of the New York Central Railway late this year. Several other lines will be included in the reconstruction and improvement program.

MONTREAL CITY COUNCIL, Montreal, Canada, has granted a contract to a local firm for the construction of the roadbed for the double tramways line across the top of Mount Royal. The project will involve an outlay of $287,415.

METAL, COAL AND MATERIAL PRICES F. O. B. REFINERY

Metals—New York	Feb. 27, 1928
Copper, electrolytic, cents per lb.	13.90
Copper wire, cents per lb.	16.125
Lead, cents per lb.	6.00
Zinc, cents per lb.	6.0375
Tin, Straits, cents per lb.	52.875
Bituminous Coal, f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	4.125
Somerset mine run, f.o.b. mines, net tons	1.875
Pittsburgh mine run, Pittsburgh, net tons	2.025
Franklin, Ill., screenings, Chicago, net tons	1.825
Central, Ill., screenings, Chicago, net tons	1.675
Kansas screenings, Kansas City, net tons	2.375
Materials	
Rubber-covered wire, N. Y., No. 14, per 1,000 ft.	15.30
Weatherproof wire base, N.Y., cents per lb.	16.5125
Cement, Chicago net prices, without bags	2.05
Linseed oil (5-bbl. lots), N. Y., cents per lb.	10.2
White lead in oil (100-lb. keg), N. Y., cents per lb.	13.25
Turpentine (bbl. lots), N. Y., per gal.	$0.645

SHOPS AND BUILDINGS

WINNIPEG ELECTRIC COMPANY, Winnipeg, Manitoba, Canada, will soon erect a new terminal power station in Winnipeg, to cost approximately $750,000.

TRADE NOTES

L. W. BIRCH of the Ohio Brass Company, Mansfield, Ohio, has been made assistant manager of the railway sales division. He became a member of the staff of the Ohio Brass Company in December, 1921, and during recent years has specialized on the overhead distribution systems for electric railways. Mr. Birch was graduated from the Ohio State University in 1917 and after a brief service in the army, in which he became first lieutenant, joined the Carolina Power & Light Company and later the Pittsburgh Plate Glass Company.

WILLIAM H. WOODIN, chairman and president of American Locomotive and American Car & Foundry, has been elected a director of American Surety Company.

TRUSCON STEEL COMPANY, Youngstown, Ohio, has named C. I. Auten, vice-president in charge of sales in its standard building division. M. T. Clark is vice-president in charge of sales of the steel window division, with which he has been identified for the last nine years. C. D. Loveland, formerly manager of the Pittsburgh district of the Truscon organization, is made vice-president with headquarters at Newark, N. J. He will be in charge of Truscon distribution in that state.

FORD CHAIN HOISTS are now being distributed on the Pacific Coast by E. O. Johnstone, district sales manager for the American Chain Company, Inc., at 425 Second Street, San Francisco, Cal.

FRED A. WALES has been appointed to do sales promotion work for the bus coach work division of the Murray Corporation, according to an announcement by William Robert Wilson, chairman and president of the corporation. Mr. Wales was former sales manager of the body division of the Aluminum Company of America. He goes to the Murray Corporation equipped with an experience of twelve years in the aluminum and aluminum alloy industry. As an officer in the production division, U. S. Army Engineers, he was closely connected with the development of the Class B military truck, known as the Liberty truck.

HEYWOOD-WAKEFIELD COMPANY has appointed C. E. Preble, who has had charge of the engineering department at Wakefield, Mass., assistant to Bertram Berry in the railway sales department, New York, N. Y.

NATIONAL FLUE CLEANER COMPANY, Groveville, N. J., has recently appointed the following representatives: Chicago territory, Naylor-Hickey Corporation, 643 Washington Boulevard, Chicago, Ill.; New England territory, Furnace Improvement Company, 511 Westminster Avenue, Providence, R. I.

OXWELD ACETYLENE COMPANY, New York, N. Y., will in the future distribute exclusively the Carbic acetylene floodlight, generator and other Carbic equipment. The Carbic cake-form carbide will be distributed by the Union Carbide Sales Company, New York, N. Y.

WHITE COMPANY, Cleveland, Ohio, has appointed Jay Rathbun a vice-president of the eastern region, with headquarters at 17 Battery Place, New York. Mr. Rathbun has been a vice-president of The White Company in charge of the export department since 1926. He became associated with the company in 1911 as manager of sales for New York State, and in 1914 was appointed manager of export sales, with headquarters in New York.

LINCOLN ELECTRIC COMPANY, Cleveland, Ohio, has appointed Jacob F. Savela as welding service manager for the Detroit district under the direction of J. M. Robinson, district sales manager.

B. F. GOODRICH RUBBER COMPANY, New York, N. Y., accepted the resignation of Harry Hough. James D. Tew, first vice-president, was elected president to take Mr. Hough's place. Mr. Hough will retain his position as a member of the board of directors and will act in an advisory capacity. Also T. G. Graham, works manager, was elected first vice-president; and T. B. Tomkinson, comptroller, and V. I. Montenyohl, treasurer, were elected to fill existing vacancies on the board.

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Operator's Seat of the "Car for 1928"

A Single Seat With a Double Purpose

The Brill Seat No. 1006, designed to give greater comfort and ease of control to operators, is quickly adjusted to four different heights. The operator can also adjust this seat for leg room without leaving his seat.

When the operator moves to the opposite end of the car, the seat can be reversed for passenger use. Thus it is popular with operator and passenger alike.

Brill Seats are inseparably connected with the chief objective of all modern cars—to earn and return the highest yield on the investment.

Specify Brill Seats—it pays

THE J. G. BRILL COMPANY
PHILADELPHIA, PA.
AMERICAN CAR CO. ST. LOUIS MO. — G. C. KUHLMAN CAR CO. CLEVELAND, OHIO. — WASON MANF'G CO SPRINGFIELD, MASS.

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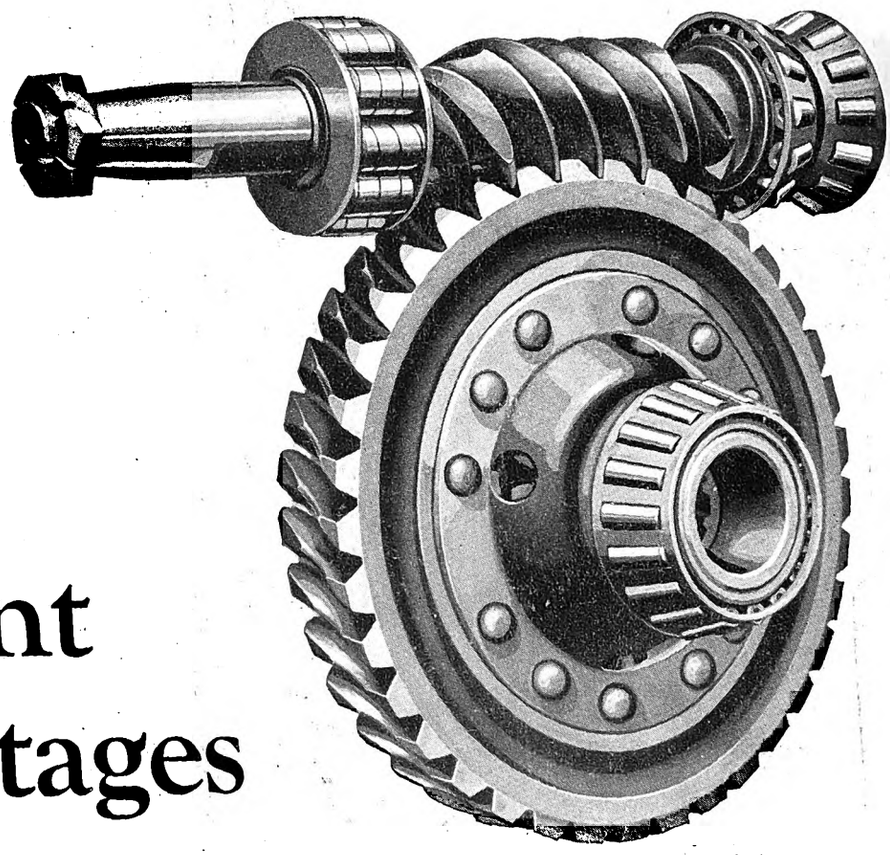

Six Inherent Advantages

In a Timken Worm Drive Rear Axle are combined these six advantages:

Silence regardless of miles
Trouble-free long life
Few parts
Strength
Unusual efficiency
Easy accessibility

Many thousands of users look upon Timken Axles with genuine confidence—because they have proved to be dependable.

THE TIMKEN-DETROIT AXLE CO., DETROIT, MICH.

TIMKEN AXLES

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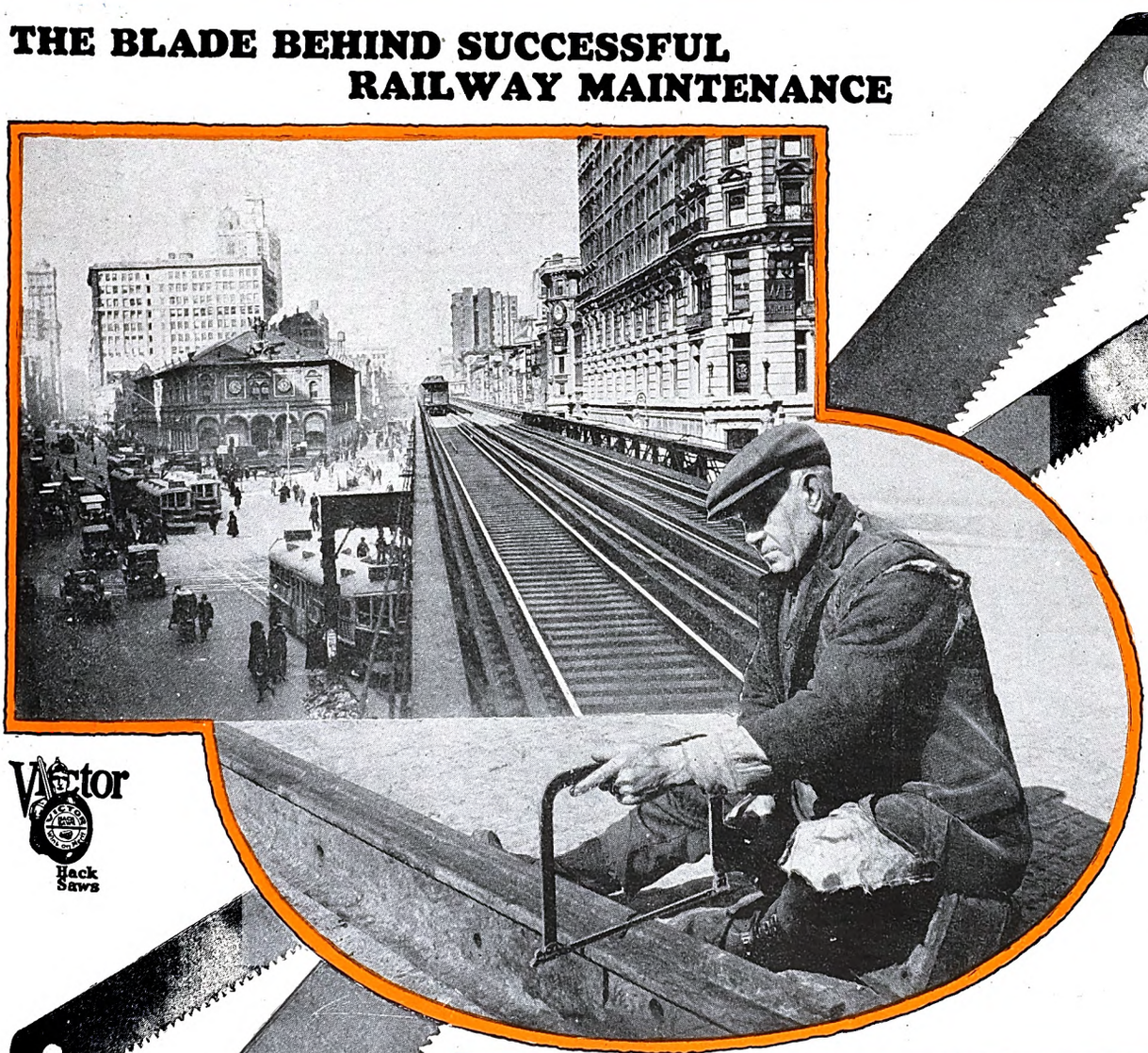
ELECTRIC RAILWAY JOURNAL

McGraw-Hill Publishing Company, Inc. APRIL 7, 1928 Twenty Cents Per Copy

THE BLADE BEHIND SUCCESSFUL RAILWAY MAINTENANCE



Victor Hack Saws

A SPECIAL RAIL BLADE

After years of experimental work we offer this perfected blade, for railway work.

It has been developed to meet every requirement as to specification, size, temper, teeth and set, that we have found essential for the hardest cutting work in railway shops.

Let us send you free sample blades, both power and hand size that will do the job.

VICTOR SAW WORKS, Middletown, N. Y.

VICTOR HACK SAW BLADES

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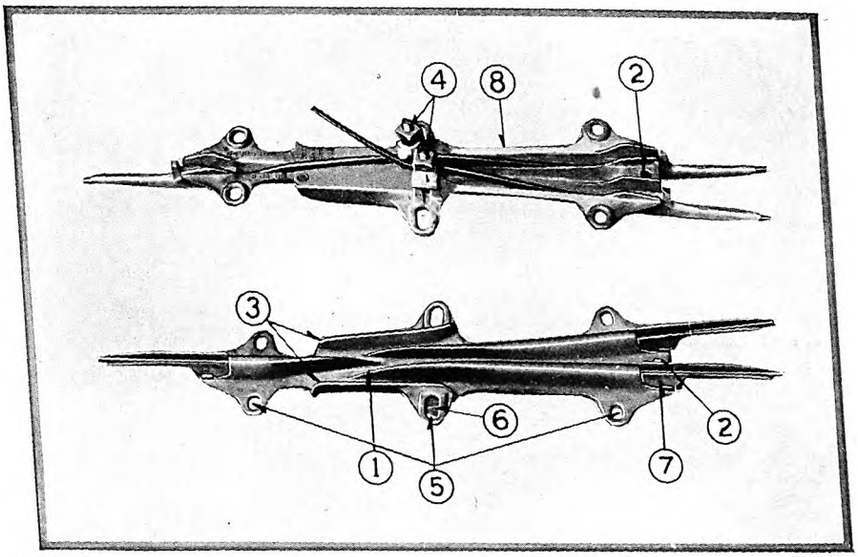
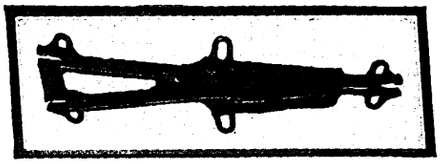
If frogs could talk—



The New Type U F Universal 10° Frog would extol these merits:



A Veteran
967,000 scheduled cars have passed under this frog.

1 Overlapping runners which prevent the wheel flange from wearing on the pan.

2 A hole with resting pads for deflection plate anchorage.

3 Especially heavy guards with ample wheel clearance which give more freedom for in and out setting during installation.

4 Independent clamps for each wire. Either wire may be adjusted or replaced without disturbing the other.

5 Standard eye spacing.

6 Eye offset to align with trolley wire.

7 Long bayonet approaches, easily removable, which lead the wheel onto the frog without bumping or arcing.

8 Galvanized malleable-iron construction.

Keep your overhead down by keeping it up with Westinghouse line material.

Westinghouse Electric & Manufacturing Company
East Pittsburgh Pennsylvania
Sales Offices in All Principal Cities of the United States and Foreign Countries

MEMBER AMERICAN ELECTRIC RAILWAY ASSOCIATION AERA 1928

Westinghouse

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Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review
Published by McGraw-Hill Publishing Company, Inc.
CHARLES GORDON, *Editor*

Volume 71 New York, Saturday, April 7, 1928 *Number 14*

Telling the Intelligentsia About the Trolley

MENCKEN'S *Mercury* for April contains an article, "The Troubled Trolley," by Raymond S. Tompkins. It is a good article. The name under which it appeared was enticing, so reference was made to the back of the book where Mr. Mencken identifies his "contribs," as Franklin P. Adams and H. I. Phillips say. Sure enough, Raymond Tompkins is none other than the assistant to the president of the United Railways & Electric Company of Baltimore. Thus do their deeds find them out. Of course, Mr. Tompkins tried to approximate the Mencken manner. And in this he succeeded, so that some of his sallies may be forgiven. Since Mr. Tompkins is himself an electric railway booster his remarks about street car Messiahs may be taken with a grain of salt. Naturally he recognizes for what they are worth some of the nostrums to which recourse has been had, but he spreads the gospel of common sense. Into the article the favorable has been packed along with the unfavorable, with a tinge of history sufficient in the way it is presented to retain the reader interest. If to some readers it would seem he is at times inclined to play ducks with those within the industry, it must not be forgotten that he plays drakes as well with the public itself. The account may be read with profit, not forgetting that the author, despite his references to the ballyhooers within the industry, is optimistic about the prospects for the restoration of the electric railway as a transportation service to full vigor and efficiency. In fact, there shines incessantly through the persiflage which Mr. Tompkins called to his aid the fact that the public is by no means ready to count out the trolley, nor are its seconds in the industry ready to toss the sponge into the ring as an admission of defeat. They have too much courage for that. And Mr. Tompkins proves it, even though he does so in a roundabout way.

The Courts Must Now Settle the Question of a 7-Cent Fare in New York

WHETHER the New York State Legislature, in its amendment to the rapid transit act in 1912, exempted the contracts authorized thereby from the general provisions of the public service law, seems to be the crux of the Interborough Rapid Transit fare case. The contention of the company is that this was not done and that the general law applying to franchises authorized by the state holds with those of the Interborough subway. In the opinion of the company, this means that the fare charged on these lines must be adequate to produce a reasonable return on a fair value of the property used in the public service, not only that owned by the company but also that owned by the city.

The fare question is now before the courts, which is the place where it apparently must be settled. If the decision is in favor of a higher fare, the city should gain equally with the company. Not only would the city profit by receiving a return on a large investment not now earning interest, but its ability to borrow funds for further subways or other public improvements would be greatly increased. It would also gain because of the improvements which the company could make in its service. Necessary extensions of the present rapid transit system could also be financed.

Representatives of the city are opposing the company in its present application, but New York as a whole would profit quite as much as the company from a decision granting a higher fare.

Transportation That Will Sell

SUCCESS of any manufacturing business comes only when the products made will be absorbed by the ultimate consumers in volume and at a price sufficient to cover the cost and a reasonable profit. This is an economic truth that cannot be controverted. That in this respect a transportation system is no different from any manufacturing concern was brought out by E. G. Buckland, vice-president of the New York, New Haven & Hartford Railroad, in his address before the New England Street Railroad Club published in this paper last week.

Making transportation that people will buy is a complicated problem. Let there be no mistake about that. After many years of effort had not solved the problem, at least in the Massachusetts cities of Springfield and Worcester, a new method of approach was tried by the New Haven, following the restoration of the two systems to the railroad. First of all, it was necessary that the buying public should have faith in the product. This necessitated negotiations of a new kind with the public authorities. Mayors of the two cities were invited to study the problem through their representatives along with those of the railroad. The finding of these experts was that in cities of the size and character of these two, where large numbers of people had to be handled in peak hours in the densely traveled portions, no other means of transportation was so economical and so satisfactory as the street railway, properly supplemented with modern motor bus service.

With this fundamental settled the company proceeded to make an investment sufficient to produce the kind of transportation that the public wants—and that is the kind of transportation the people will buy. New cars, new track, new buses are combined with a new attitude on the part of the management and the employees, to give a brand of product with which the public has not been familiar, but which it appreciated.

Not that the New Haven was doing all this from an altruistic viewpoint. The New Haven has something to sell, apart from the local transportation in these cities. Can it be gainsaid that the vast improvement in the relations with the citizens locally will have a good effect on the general transportation situation, both freight and passenger, of the parent road? The New Haven has so

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much at stake that even if it made no profit out of these local systems the good will created by the attention that has been paid to the public—its own customers—will pay handsomely in the improved outlook of the railroad itself.

It has taken a long time for the New Haven to appreciate all the possibilities in the situation. But it now has done so, and has pointed the way for other companies. There are many electric railway orphans under the control of light and power syndicates that are being carried along because they must be, and service is given half-heartedly because the franchise makes operation of some sort necessary. How much better it would be to adopt the policy of the New Haven, make the railway property stand on its own feet, and so make it return a profit, if not in cash, then in the good will it can create for the benefit of the larger system.

English Companies Admonished to Court Public Favor on Their Merits

"ABOLITION of the tramways" is a cry now very rarely heard in England, even the most rabid of the anti-tramways' party having been convinced—much against their will—that tramways are here to stay, simply because they are absolutely indispensable to provide the transportation requirements of the people. Thus, says the *Electric Railway & Tramway Journal* in a recent review of the prospects for 1928. The functions of the bus have come to be better and more sensibly defined, and its adoption and use have been hastened and co-ordinated in an eminently satisfactory manner. As the English commentator sees it these are all notable gains from the standpoint of efficient public services, and their settlement enables all tramway operators to plan their future with a measure of confidence which has not existed for many years past. The results of this more healthy and better feeling are making themselves apparent on all sides. All the large tramway undertakings, and many of the smaller ones, are adding freely to their rolling stock, or are re-conditioning their old cars, being convinced by the stern logic of facts that it is only by becoming thoroughly up-to-date in that respect that they can hope to live and thrive. It is recognized that passengers want, and will have, comfort if they are to be patrons of the tramcars, hence the movement in the direction of transverse seats and close attention to upholstery. The buses give these refinements, and the cars must do likewise if they are to compete successfully.

In England, as in the United States and Canada, efforts are being made to augment the speed of the cars, and something has been accomplished in that respect, but, as the review points out, much more needs to be done by cutting out redundant stops and by adopting more efficient methods of loading and unloading before speeds can be deemed to be satisfactory. Again, as in the United States, while the movements in the directions just indicated are highly satisfactory so far as they go, there are scores of other changes and improvements which could be—and it may even be said must be—made before the tramways can be said to be doing justice to themselves and demonstrating to the full the numerous and incontestable advantages that they possess as an efficient means of public transportation. The admonitions of ELECTRIC RAILWAY JOURNAL are reflected by the reiteration of its British contemporary to the effect that the English companies must show that their industry is dynamic and not static, that they are out to please the public, and that they court public favor on their merits and not on sufferance.

Changing Aspects of Transportation in New Jersey

MUCH progress has been made by the Public Service Corporation of New Jersey on its program for co-ordinating railway and bus operation. The work done during 1927, which is reflected in the annual report of the company, digested elsewhere in this issue, shows the extent to which the process has been carried. During the year there was an increase of 29,822,141 passengers over the number in 1926. This was due in part to the normal increase in traffic in the rapidly growing territories served and in part to the acquisition of bus lines from independent operators, the putting of new lines into service, the extension of routes and the starting of lines giving a higher grade of service at a higher rate of fare. In all, 627,153,013 passengers were carried, 266,079,948 of them by bus compared with none so carried in 1922 and only 1,952,059 by bus in 1923. Thus is the extent of the growth of the use of the bus by the company reflected in the official figures. This makes the company the third largest in the world operating as a single unit. It is surpassed as a bus carrier only by the systems in London and Paris.

In improving the railway and bus properties $5,973,531 was spent during 1927. This certainly is a big sum, but the Public Service is a big system and it is undergoing significant changes. On no other system in the country are the changing aspects of the industry better reflected than on this state-wide system, which includes city, suburban and interurban operations.

Hook Up to the Reader's Interests

MOST electric railway managements are now alive to the fact that the great advantage of newspaper advertising is reader interest. Unfortunately, not all of these same managements appreciate the fact that unless the messages take on the color of news they are not welcomed and are far from immediate in effect. Consequently, the very purpose for which the space was bought and paid for is defeated and in the medium which, all things being equal, should insure instantaneous attention. Opposed to this waste of words and money on the part of some railways, is the carefully poised newspaper copy of other companies which frequently effects a tie-up between the message in the advertisements and the vital interest of the community. It would appear that these companies are buying space wisely and winning customers effectively.

For example, the publication of the electric railway schedule to reach a local store on "dollar day" makes more of an appeal to the bargain hunter than statistics on railway mileage last year or last month. A picture of the comfortable seats in an interurban which runs direct to the playhouse showing Richard Barthelmess in the "Patent Leather Kid" accompanied by some teaser copy is a bigger inducement to "ride the trolley" than the economics of railway riding compared with that of competitive agencies. Similarly, an invitation to inspect new cars "today" is a more forceful selling argument than mere statements on safety, speed and economy of car riding. Not that the importance of these features in railway operation is to be minimized; but to attract the attention of the hurried newspaper reader who can afford only a very limited part of his day to the reading of news, the railway story should be tied to the reader's own interests.

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An Often-Neglected Way to Reduce Costs

IN THESE days electric railway executives are exerting every effort to effect operating economies to offset decreasing revenues. Very few, however, really give consideration to the matter of fire insurance as a means of reducing their operating costs. In the matter of housekeeping alone, many thousands of dollars in insurance premiums could be saved annually without involving a large expenditure. Keeping premises clean and in order, the proper distribution of approved waste cans, fire extinguishers and sand pails, and the substitution of approved metal lockers for wooden lockers involve little expense, while the reduction in insurance rates thus effected is important.

The prevention of freezing liquids used in fire protection apparatus such as fire extinguishers, water pails and stand pipes, and the enforcement of "No Smoking" rules in car shops and carhouses, involve little, if any, expense; yet they have a direct bearing in reducing insurance rates.

The installation of properly approved sprinkler systems in carhouses and car shops probably offers the greatest saving in fire insurance premiums. In many instances, a sprinkler installation will pay for itself in from three to five years. In fact, today nearly every concern selling sprinkler systems will install complete equipment and accept in payment therefor the annual savings in insurance premiums.

As pointed out in an article in this issue by O. H. Bernd, the Des Moines City Railway, by the adoption of these principles and by carrying out a campaign among the workmen for better housekeeping, has been able to reduce its annual insurance costs $6,315, or 44.4 per cent. Even if it were found necessary to employ a man who would devote his entire time to this one thing, and to pay him the entire saving in premiums, it would be worth while on account of the greater feeling of security and reliability of service that will be obtained. Though the anticipated fire never may happen, still the removal of potential causes goes a long way toward insuring that it cannot under any conditions disrupt the service of the road and take away much-needed revenues.

Make It Easy for the Public to Ride

REGRETS often are expressed that street railway traffic gradually is being confined to necessity riding. Certainly there is a trend in that direction. Those who bemoan the trend most loudly, however, not infrequently are the very ones who are doing least to counteract it. For one thing, efforts to encourage the casual rider to use the street car have been sadly lacking in many American cities. Far too little has been done to tell him how to use the service.

At least in the medium-sized or large cities nearly every street car carries one or more signs of some sort to tell where it is going. The signs do not always give much information. Often they are too few, they are not prominently displayed, and the lettering is too small for legibility. Inadequate illumination is provided, and all too often the signs are old and dingy. Even the largest, most legible and best illuminated ones give only meager information as to where the car is going. Admittedly it is difficult to give a full description of the route on a sign. The deficiency has been met in some places by distributing maps of the system showing just where the various routes run. This practice is widely followed in Europe. In this country one seldom sees such a system map. Abroad it is common practice to place at prominent points in the street, signs giving the names or numbers of the car routes that pass a given locality.

All too often it is argued that signs are of use to the stranger only and that the resident of the city has virtually no use for them. It is true that they do not make much difference to the person who knows just where he wants to go and how to get there, and who already has decided to go by trolley or bus. But even the old resident, as soon as he gets off his beaten track is little better acquainted with the routing of the system than is the stranger in town. Many a person who would patronize the transportation system if he knew more about it actually uses some other vehicle, probably a taxicab. He is willing to spend a little more money rather than take the trouble to find out how he can get to his destination by street car. He is a potential rider and his patronage could be secured by a few simple efforts to sell him the service. If the non-necessity riding is to be sold, the company must do as progressive business houses do and give the purchaser a full description of the product that is for sale.

Careful Training Results in Safety

ONE is appalled to learn that during the last five years 115,000 persons have lost their lives accidentally, more than 3,000,000 have been injured and accidents are increasing about 2,000 annually. In isolated instances a week devoted to safety parades and speeches brings gratifying results, but to have more than a transient effect it is necessary to have a well-planned campaign that continues and an organization always on the alert to keep safety before the public.

In a recent United States Supreme Court decision is a constructive suggestion for future safety at grade crossings. A man, who was killed while crossing a railroad track, heard neither the train nor any other signal and took no further precaution. The court held that he did so at his own risk. To take every precaution necessary was his duty, according to the ruling, so that his own negligence caused his death. It was a "standard of conduct" the court was dealing with "and when the standard is clear it should be laid down once for all by the courts." Many avoidable accidents at crossings or in streets are directly attributable to the wanton neglect of "further precautions." Some well-informed authorities go still further and hold that there is no such thing as an unavoidable traffic accident.

In conducting an inquiry into an interurban accident some time ago a Public Service Commission made no drastic recommendations but did urge greater caution on the part of the general public and common carriers at all railroad crossings, insisting that all existing speed regulations and signals be obeyed and used.

Fortunately, accidents on interurbans and street railways are rare and not only, as some one tersely concluded on looking over the statistics, because an erring motorman "must answer to a stern boss," but also because an effort has been made to teach the motorman the ways of the motorist. In this way the human machine is developed to operate at the critical time when the careless pedestrian or motorist neglects his own safety.

In reporting the progress of its national highway safety campaign the American Road Builders Association stated that more than 200,000 persons pledged themselves to use courtesy and caution on the highways this year. Such a pledge implies mental alertness, sound reasoning and a "standard of conduct." Its slogan is short in preachment. May it be long in practice.

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Detroit Survey

Develops Basic Traffic Data

An improved traffic signal system, reasonable parking restrictions, distribution of traffic, pedestrian regulation and more efficient utilization of transportation vehicles are proposed to give relief

PART ONE

Triple parking, preventing the use of three travel lanes, is a serious parking law violation. The two offenders in this case are jitneys

RECOGNITION of the need for reducing traffic hazards and the economic losses due to traffic congestion, and the possibility of making more efficient use of its streets, prompted the city of Detroit, Mich., through its Police Department, to conduct an extensive traffic survey which was recently completed under the direction of A. T. Waterfall, chairman of the Mayor's traffic committee and third deputy police commissioner. The actual work of the survey was handled by Harold M. Gould, engineer in charge. He was assisted by H. S. Simpson, traffic engineer for the Mayor's traffic committee, and an organization built up by these two engineers. The work was started in October, 1926, and the final report submitted in September, 1927.

An appropriation of $30,000 for conducting this work was made by the Detroit Common Council upon the recommendation of Mr. Waterfall. There have been many suggestions for the improvement of traffic in Detroit, most of them mere expressions of opinion and not supported by facts. Along with these came demands for street widening, paving, and numerous other items involving large expenditures. Extensive street improvement programs were suggested by some city officials, even though Detroit was fast approaching its bonding limits. This survey was therefore suggested as a means of studying the city's traffic problem as a whole, with a view toward the establishment of definite policies that would bring about relief. It was felt that Detroit, as the center of the automobile industry, should take the lead in the analysis and amelioration of the traffic congestion problem.

As a result of preliminary studies it was estimated that Detroit, in common with most large American cities, is less than 50 per cent efficient in the use of its streets, and that the annual economic loss due to traffic congestion and delays is more than $30,000,000. The report of the survey is divided into two parts, each separately submitted. The first part includes surveys of alley traffic, street parking, garage and parking lots and studies of economical vehicular speed and downtown business district traffic flow. The second part of the report includes studies of garage and parking lot

AN important purpose of the report was to collect and present basic facts regarding traffic conditions so that these data might be available for judging the effectiveness of various traffic relief measures proposed.

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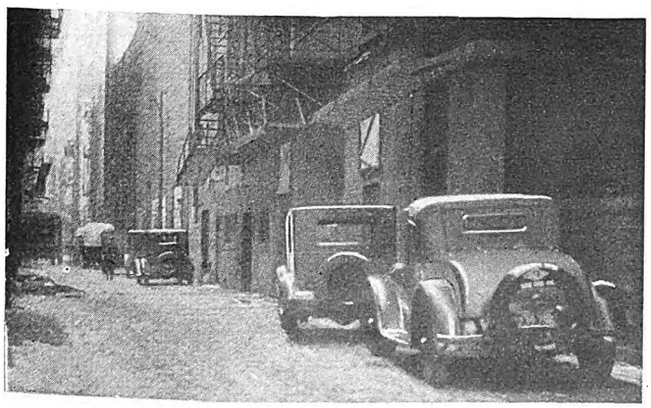
facilities outside of the downtown business district, night street storage of vehicles, freight and merchandise handling and transportation, cruising taxicabs and private automobiles, pedestrian control, school crossing protection, accident statistics and their use, travel habits of representative groups of the population, traffic direction and volume, trends of business and building development and a summary of suggestions made by individuals and organizations regarding improvement of the traffic situation. Numerous exhibits, charts, diagrams and tables were prepared from the data obtained. They proved valuable in showing the conditions as they actually exist and in dissipating popular fallacies regarding traffic matters.

Three General Relief Measures Proposed

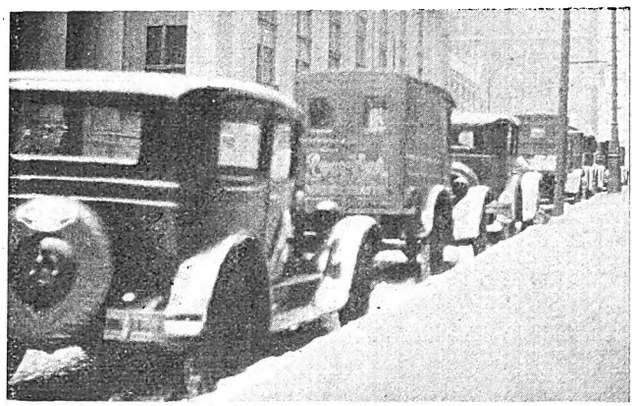
General measures for improving traffic movement, recommended by the report, group themselves under three headings: First, a traffic signal system that assists in producing a uniform fluid movement of vehicles and at the same time provides ample time allowance for pedestrians; second, regulations including reasonable parking restrictions, maximum use of travel lanes, distribution of traffic by the use of by-pass streets around congested centers, and pedestrian movement; third, a more efficient utilization of existing transportation agencies, including the motor car, bus and street car, through co-ordination and such measures as the express car experiment on Jefferson Avenue, operation of trucks at night, etc.

The report suggests further that merchants and truck operators make every effort to load and unload freight in alleys. It recommends the prohibition of alley parking of private automobiles and blocking of alleys by building construction. It suggests that numbers and names of business firms be provided at the alley entrances; that a strict observance of the parking provisions of the present ordinances be procured, especially during rush hours; that city departments, public utilities and other interests endeavor to arrange their field work so as to avoid partial blockade of travel lanes; that all vehicles be parked parallel to the curb, even in loading and unloading; that the present automatic signals on Cass Avenue be re-equipped as platoon-type operated signals for an extended test of this signal method, and that additional automatic signal installations be suspended until the above mentioned test has been completed.

A test of the combination express trolley car and local bus service, which is now under way on Jefferson Avenue, was recommended as a means of improving the speed and convenience of public transportation service, at the same time reducing traffic congestion. Other specific suggestions included in the report are that unpaved alleys serving stores and business houses be paved; that consideration be given to night illumination of alleys as a means of increasing the use thereof, both for trucks in the business districts and motor cars in the residential districts; an attempt be made to increase the use of parking lots and other off-street parking spaces; that an ordinance be enacted prohibiting street parking of vehicles between the hours of 3 a.m. and 6 a.m. to reduce thefts and accidents; that merchants study the matter of night pick-up and delivery of freight and merchandise; that space be assigned for taxicab stands, and that automatic call boxes be installed to reduce the amount of taxicab cruising. The report recommends a test to regulate pedestrian movement, including marking sidewalks into three distinct lanes in an attempt to better pedestrian traffic flow. It suggests that automatic traffic signals be installed so that pedestrians can observe them easily, and that an accident analysis committee be formed to apply actively accident prevention remedies through detailed analyses of the monthly reports of the Accident Investigation Bureau. Other recommendations are brought out in the presentation of the detailed information within the report.



Private automobiles parked in alleys for long periods obstruct the movement of commercial vehicles



An example of the absolute disregard of "No Parking" signs by some motorists

One thing upon which particular stress is laid is the necessity for a determination of policy as regards the installation of automatic traffic signals, that is, whether the ultimate result is to be the aggregate of signalled intersections or a gridiron of signalled routes; the former producing frequently interrupted traffic movement on any possible route, and the latter, if progressive signals are employed, aiding in the procurement of uniform and uninterrupted traffic movement on certain important arterial routes.

Many Unfavorable Conditions in Alleys

Although Detroit's alley system is adequate to permit segregation of passenger-carrying and freight-carrying vehicles in the business districts, the absence of street numbers and in most cases of firm names on alley entrances of business houses, has led to their improper use for storing private automobiles, and building construction materials instead of for the loading and unloading of freight-carrying vehicles to relieve street congestion. Some buildings abutting on alleys were found to have no alley access; and some business houses used the street for freight handling because their elevators were located

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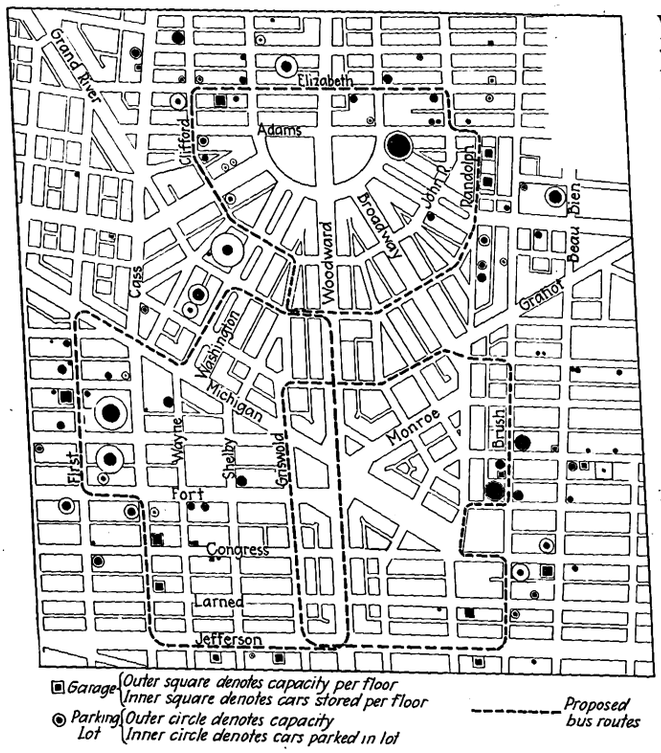


Detroit has adequate off-street parking facilities, but motorists do not use them extensively

The survey of available garages and parking lots in the Loop district showed 22 garages and 106 parking lots with capacities of 5,735 and 7,660, respectively. Unused spaces averaged 6,000 each day. Three bus routes were proposed to serve the garages, parking lots, stores and buildings.

adjacent to streets. As a remedy, the report suggests an ordinance providing for placing street numbers and the names of business firms occupying the premises at alley entrances, and that business firms whose premises abut on an alley provide adequate entrances as soon as possible; that sidewalk freight elevators be moved to the alley entrances wherever such an alley is available; that alleys be kept clear of rubbish and garbage; that the blocking of alleys by building construction materials be prohibited; that merchants and truck operators load and unload freight in alleys wherever facilities are available; that when trucks are stopped for any purpose in alleys, care should be taken to avoid blockading, and that parking of private automobiles in alleys be prohibited.

The report calls attention to the need for strict enforcement of parking restrictions in the congested business district. To determine the volume and characteristics of street parking a field survey was made in 48 selected sections of the city over a period of nine hours. The field men traversing the business section every 30 minutes recorded the license numbers of all parked automobiles, whether single or double parked, whether they were parked legally or illegally, and in addition noted the location of horse-drawn vehicles. This information showed that many of the permissive parking spaces in the downtown district were occupied for periods greatly in excess of the legal time limit; also, that many automobiles were parked where parking was prohibited altogether. The maximum demand for curb parking space occurred between 1:30 and 2 o'clock in the afternoon, at which time there were recorded 4,715 vehicles parked, whereas the permissive parking space numbered about 3,753. The influence of the one-hour parking limit was very pronounced in that out of a total of 32,450 parked vehicles recorded during the day, 25,185 were parked for one hour or less, leaving a balance of 12,265 vehicles which exceeded the one-hour limit.

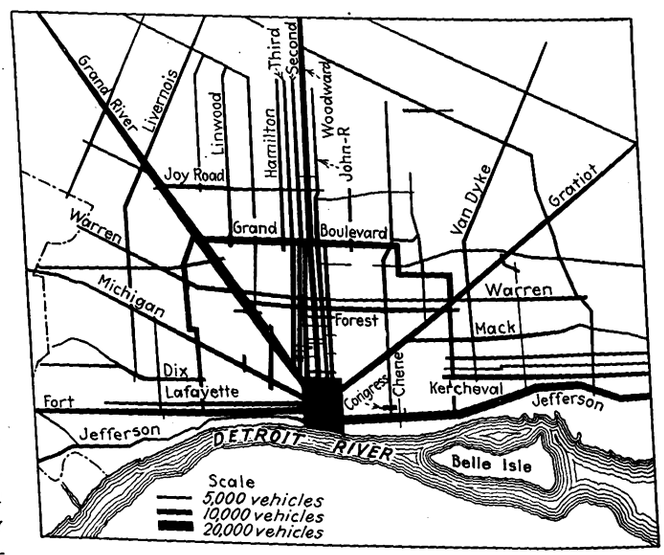
Of 195,078 persons who were tallied at 27 stores during three days in November, 1926, 36,272, or 19.1 per cent, came by private automobiles. Of this number 20,393 parked their autos in the street and 15,879 in garages or parking lots. The other modes of transportation used were the motor bus or jitney, which accounted for 24.2 per cent, and the street car, which accounted for 56.7 per cent. The survey proved conclusively that storage of vehicles on business streets is not justified.

Off-Street Parking Facilities Adequate But Not Used

A survey of the available garages and parking lots in the business district showed 22 garages and 106 parking lots, with capacities of 5,735 and 7,660 vehicles, respectively. The combined capacity totaled 13,395 cars. While the street parking survey showed 7,309 automobiles parked for periods in excess of one hour, the garage survey revealed that on the first day there were 5,524 spaces unused in garages and parking lots and on the second day 6,578. It is assumed that the average of 6,000 unused spaces in garages and parking lots would be ample to accommodate the 7,309 illegally curb parked vehicles whose average storing time was approximately three hours.

Strict compliance with the traffic ordinance, it was held, would not act as a deterrent to motorists driving into the downtown business district, but would simply have the effect of changing the storage habit of those who now store their automobiles in the street.

Closely allied with the vehicular movements and parking in the downtown business district is the matter of economical vehicular movement between this district and other districts, business or residential. A study of vehicular speeds and traffic flow between the districts is



Traffic flow for twelve-hour period on the major thoroughfares

Counts were taken every day for two weeks to secure average figures and checks made at four later periods. Vehicle tallies were made also in the Loop district and the data charted.

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covered in the report. An inventory was taken of the automatic traffic signals installed both within and outside of the downtown district. The data show that there were 305 locations where signals were installed, 13 from which signals had been removed and 110 for which signals had been requested. It was recommended that a fixed policy be established with respect to all signal requests, and that a study be made of each section before a signal be installed for use.

A study of four different types of signal control, namely, the isolated traffic signal, synchronous, partial platoon and full platoon or progressive system, showed that the latter type was perhaps the most desirable. Time-lane diagrams were prepared for a portion of Cass Avenue, showing vehicular movements obtained with the use of the four different types of control. The charts show a decided advantage for the progressive type from a point of speed and street capacity. The report suggested that a thorough test be made of this type of control and if found as satisfactory as anticipated that other installations be made.

Rush-hour traffic should be given special preference by keeping open for moving vehicles the full width of the pavement in the direction of greatest traffic movement. Although this is provided for by ordinance in Detroit it is not satisfactorily observed. Another disturbing factor is the obstruction of traffic by slow-moving vehicles.

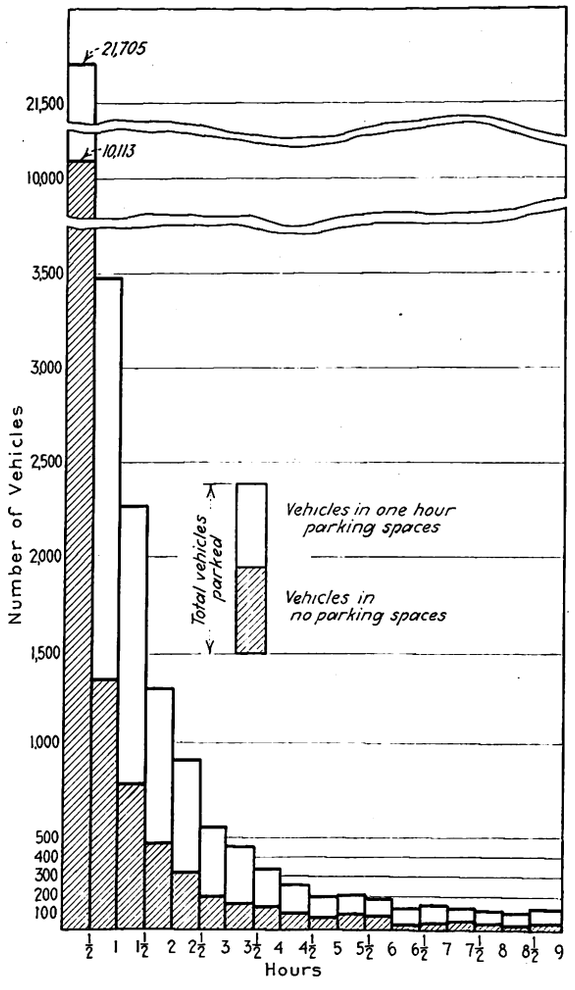
Street cars using the natural highest speed lane and operating on a local stop service become low speed vehicles, and in view of the ordinance requiring other vehicles to stop with them, have a very definite retarding action on all other vehicular movements, according to the report. A speed of between 15 and 25 m.p.h. is said to be the most efficient for the flow of vehicles along a thoroughfare. Tests made on several Detroit streets showed that the average speeds were considerably lower than they should have been.

It was suggested in the report that a plan of operating street cars express with supplementary buses to give local service be tried on some route in the city. This is being done on Jefferson Avenue as described in the Jan. 7, 1928, issue of ELECTRIC RAILWAY JOURNAL. Such a combined service was expected to expedite materially the flow of all types of vehicular traffic on any street where trolley cars are operated.

TRAFFIC FLOW DATA IN LOOP DISTRICT OBTAINED

A vehicular traffic flow map shows the volume of travel on the various streets within the downtown business district. It is intended to use this map and other traffic flow data in planning the further installation of automatic traffic signals.

The following suggestions were made with respect to traffic signals and vehicular speed: That the present automatic signals on Cass Avenue be re-equipped as progressive-type operated signals for tests, preparatory to the general adoption of this type of control; that the installation of additional automatic signals be postponed until the above mentioned test has been completed and only after field tallies and analyses show that the proposed signals meet the conditions of controlled routes, rather than controlled isolated locations; and that a reduction be made



This chart shows the length of time vehicles park in the "No Parking" and "One-Hour Parking" spaces of the Loop district

in the number of stops of all vehicles, particularly street cars. In the sections outside of the downtown business district, surveys were made of garages and parking lot facilities, night street storage of vehicles, freight and merchandise handling and transportation, cruising taxicabs and private automobiles, pedestrian control, school crossing protection, accident statistics and their use, public transportation agencies, traffic direction and volume and development of outlying business centers.

Even outside the central business district, unrestricted parking was found to limit seriously the number and capacity of movement lanes. An extensive survey of garages and parking lots available showed a marked deficiency in the number needed. It was suggested that this deficiency could be met in part by the use of rear lots, vacant lots and the space between the curb and sidewalk.

IT has been estimated that Detroit, in common with most large American cities, is less than 50 per cent efficient in the use of its streets, and that the annual economic loss due to traffic congestion and delays is more than $30,000,000.

Expenditures need not be made for street widening unless there is a legitimate demand for space for moving vehicles that cannot be met by existing facilities. It was suggested that private companies provide parking spaces wherever possible; that merchants of a neighborhood use collectively a near-by vacant lot; that the space between the curb and the sidewalk be used; that automobile parking be prohibited on certain thoroughfares dur-

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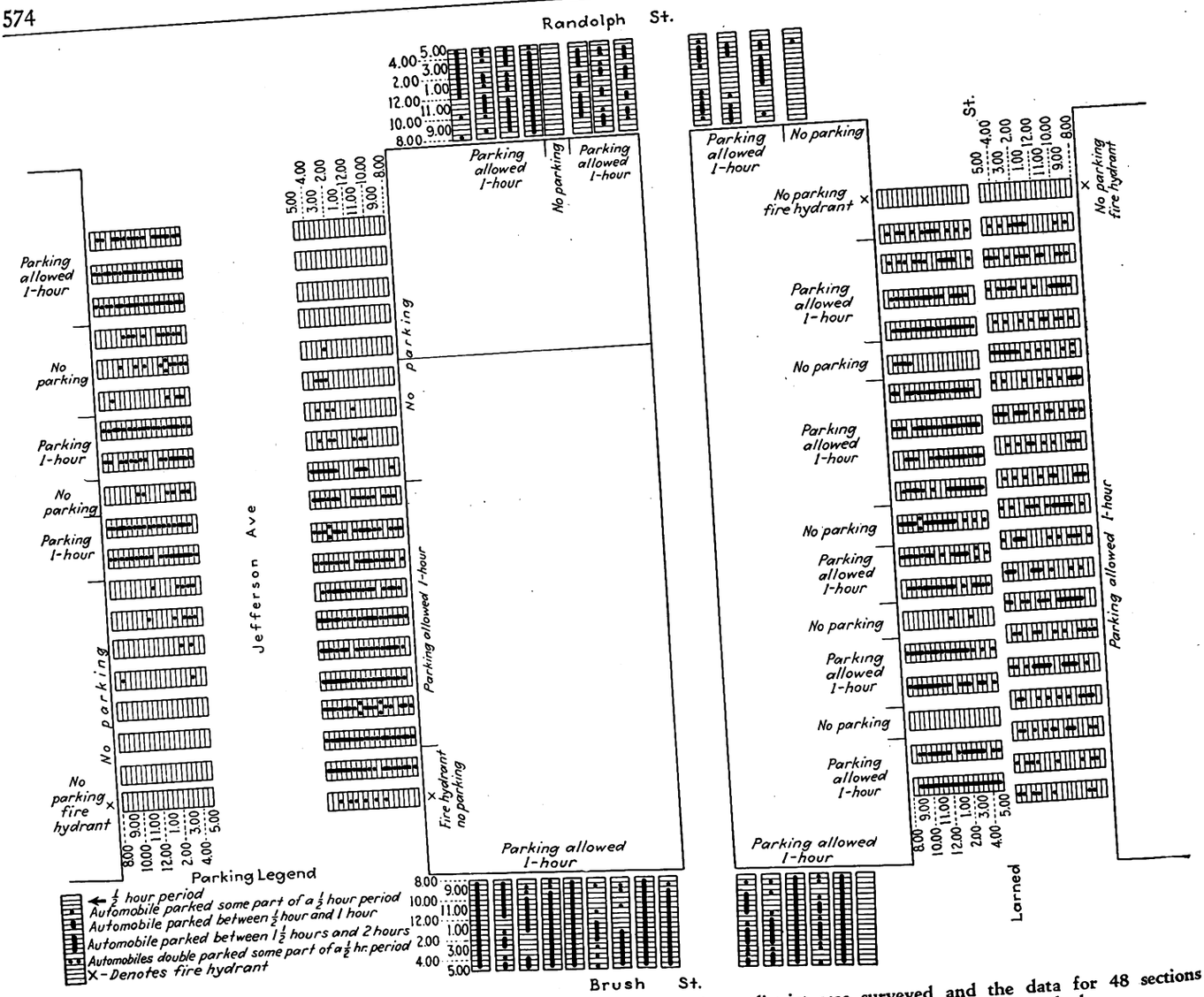

The volume of street parking and the turnover thereof in the central business district was surveyed and the data for 48 sections charted as above. Each chart shows by half-hour periods how long vehicles were parked, vehicles parked double and those occupying "No Parking" spaces

ing certain periods of the day, and that alleys outside the business district be paved and illuminated. A chart was prepared to point out the possibilities of the use of parking lots just outside of the downtown business district to take the overflow of cars which at any time cannot be accommodated properly within the district.

Night street storage in Detroit has become a big problem in face of the increasing number of motor vehicles and the several serious drawbacks to this mode of storage. Where the number of cars owned per block is in excess of the off-street storage facilities, street parking occurs. A survey was made in twelve representative districts to determine the number of alley garage spaces, divided into vacant and rented; the average monthly rental therefor; the capacity and average amount of vacant space in public garages, and the number of night parked vehicles block by block. The survey shows that the amount of vacant garage space is inadequate to house the vehicles which the records show were stored in the street. This condition is particularly true in districts where apartment houses predominate. On the other hand, many of the garages were nowhere near filled and the conclusion was reached that garages will not be used to capacity while free street storage is so easily procured. High rates and inaccessibility of garages are contributing causes to night street storage.

The presence of unguarded vehicles in the streets during the night is a temptation for theft. A majority of thefts occur between midnight and 6 a.m.

The movement of commercial vehicles, the control of pedestrian traffic, and the modes of travel used by 101,541 persons in reaching their homes from eleven employment districts will be discussed next week.

Of especial interest to public transportation operators!

A map showing the travel habits of 101,541 persons in Detroit will be presented in Part II of this article.

Don't fail to read it!

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Gas-Electric Cars Cut Railroad Costs

Fuel and crew costs are reduced on branch lines of steam railroads by substituting gas-electric equipment

By W. R. Stinemetz
Assistant to Transportation Sales Manager
Westinghouse Electric & Manufacturing Company

GAS-ELECTRIC cars, because of their low operating costs, are useful for the light and infrequent traffic of branch line service of railroads. Their use also stimulates traffic by providing the traveler more attractive accommodations than those of obsolete rolling stock usually assigned to steam branch line service.

To show how much a gas-electric car can save a railroad, a typical example of an average month's operation of a motor car and trailer actually substituted for a branch line steam train will be given. The steam equipment consisted of a locomotive and tender, a combination baggage car and smoker, and a passenger coach. The gas-electric train consisted of a combination baggage-smoker motor car and a passenger-trailer coach. The trains had the same space accommodations but the steam train with its locomotive and tender totaled more ton-miles. One round trip was made per day over the 40-mile line for 30 days, with the results given in Table I.

The gas-electric system shows a net saving of $1,568 per month or $18,816 per year, largely accounted for in three items—fuel, crew wages and repairs. This amount represents about 31 per cent of the investment for the gas car and trailer, allowing no salvage value for the steam train equipment replaced.

Eliminating Brakeman Effects Further Savings

Further savings have been effected on other roads by arranging the two-car train so all passengers enter or leave by one platform, and eliminating the brakeman from the train crew. One road using the system is handling the same amount of traffic as with the old four-car steam trains, and with passengers better satisfied. The average cost to run the steam trains was $1.08 per train-mile whereas the motor train gave the same service for a

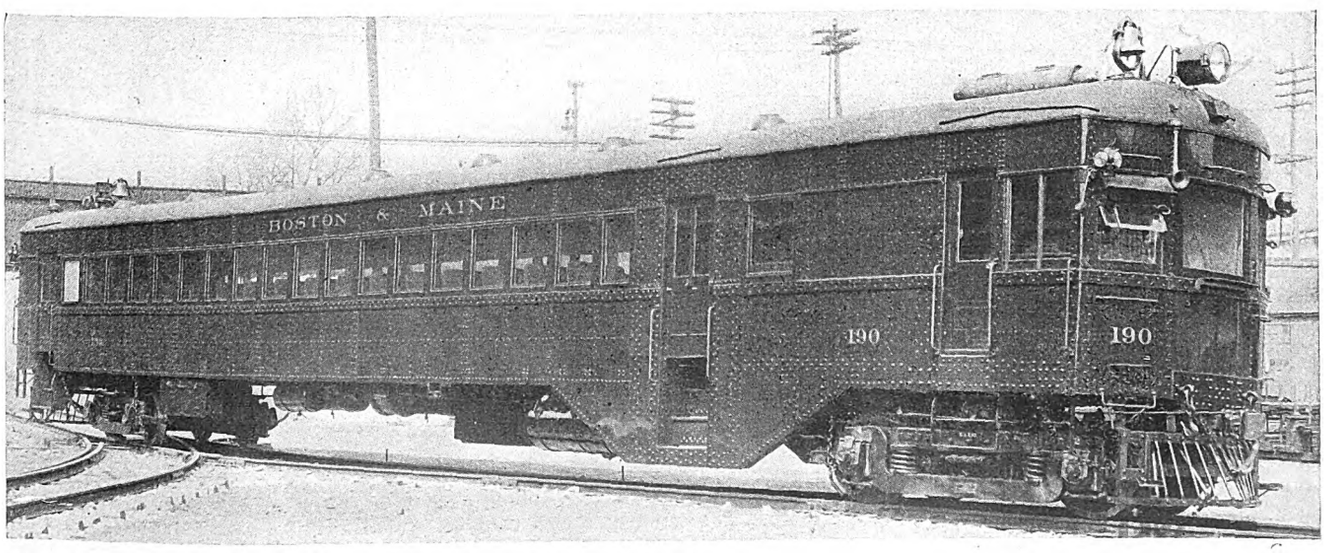
A 60-ft., 250-hp. electric car of the Philadelphia & Reading Railroad at the Trenton, N. J., station

year at a cost of 38 cents per train-mile. On the foregoing basis, one of these train units costing $60,000 gross would show, with a daily service of 100 train-miles, a saving of $25,550 per year, or 43 per cent on the gross investment.

When traffic is too heavy for single power units and trailers it is entirely feasible to use multiple-unit gas-electric car trains in a manner similar to multiple-unit car operation on an electrified line. The savings which could be expected with multiple-unit gas car operation under more congested conditions are shown in the following

TABLE I—30-DAY EXPENSE RECORD OF GAS-ELECTRIC AND STEAM TRAIN OPERATIONS

	Gas-Electric	Steam
Fuel (coal or gasoline)	$338.20	$603.00
Lubricants	17.11	35.00
Water	.....	10.00
Cleaning cars or engine	56.52	35.00
Supplies	6.86	35.00
Engineers' wages	297.72	297.72
Conductors' wages	288.56	288.56
Trainmen's wages	214.54	453.46
Firemen's wages	.....	220.30
Engine house expense	46.87	101.00
Running repairs	210.36	966.00
Totals	$1,476.74	$3,045.04
Average cost per passenger-mile, cents	1.21	2.49
Average cost per train-mile, cents	59.80	123.00



A typical 73-ft., 250-hp. Brill-Westinghouse gas-electric car of the Boston & Maine Railroad

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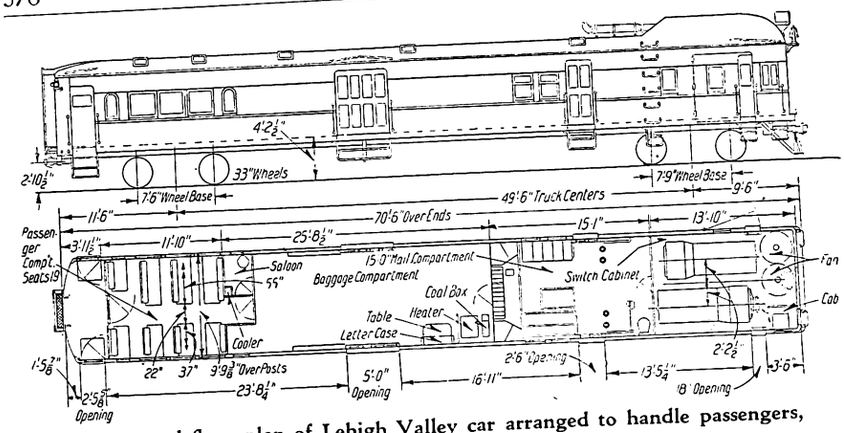

Elevation and floor plan of Lehigh Valley car arranged to handle passengers, baggage and mail

TABLE II—ANNUAL OPERATING EXPENSES FOR STEAM AND GAS-ELECTRIC OPERATION

	Steam Operation		Gas-Electric Operation	
	Cents per Train-Mile	Total Cost per Year	Cents per Train-Mile	Total Cost per Year
Crew expense	38.58	$282,720	31.460	$230,557
Fuel (coal or gasoline)	23.90	175,113	19.090	139,879
Locomotive repairs (motor car)	29.70	217,610	6.036	44,227
Locomotive supplies (oil)	1.70	12,359	1.794	13,151
Engine house expense	7.70	56,419	2.414	17,692
Train supplies and car expense	8.00	58,616	2.753	20,172
Totals	109.58	$802,837	63.547	$465,658
Cost of yard switching and facilities	.....	55,900	.....	18,650
Total main line and yard	.....	$858,737	.....	$484,308

comparison. The 190-mile division considered joins a large city terminal and a moderate-sized city. In addition to several through trains daily the large city terminal handles ten local passenger trains in each direction, in the suburban zone of 40 miles. The smaller city also has a suburban zone of 40 miles, and requires four trains in each direction daily. To handle the service with steam requires six Pacific-type passenger locomotives, sixteen passenger locomotives for local service and 75 passenger and express cars, with a total salvage value of $275,000.

To maintain the same schedules with complete new gas-electric motor cars and revamped steam trailers and provide express and passenger service would require 37 motor cars at $39,500 each and 37 revamped trailers at $2,500 each, a total cost of $1,554,000. Allowing a salvage value of $238,000 for the locomotives and 38 cars the net investment would be $1,316,000.

Annual Expenses Considerably Lower for Gas-Electric Equipment

The annual operating expenses of the equipment, based on reliable data, are given in Table II. Here again the principal savings are in crew expense, fuel and maintenance. The standby fuel losses are eliminated and the gas car consumes fuel only when doing actual work. The large maintenance saving is due to the age of the steam locomotives as compared with the new gas-electric equipment. This factor, however, is balanced by the higher fixed charges incurred by the net investment for the new equipment. In Table III comparative data are given showing the saving of gas-electric operation over steam operation. Using the figure of $1,316,000 for the net investment of gas-electric equipment, the fixed charges, including interest, insurance, taxes and depreciation total $170,477. This figure added to the annual operating expense of $484,308, indicated in Table II, gives a total annual cost of $654,785. The corresponding figure for steam is $990,954, so that a saving of $336,169, or 25.6 per cent of the net investment, is shown for gas-electric operation over steam.

TABLE III—COMPARATIVE DATA SHOWING SAVING OF GAS-ELECTRIC OPERATION OVER STEAM OPERATION

	Steam	Gas-Electric
Net investment	.....	$1,316,000
Annual operating expense	$858,737	484,308
Fixed charges*	132,217	170,477
Total operating expenses	990,954	654,785
Saving over steam operation	.....	336,169
Per cent saving on net investment	.....	25.6
Per cent saving without fixed charges	.....	28.5

*Include interest, insurance, taxes and depreciation.

The heavy electric traction committee of the American Electric Railway Engineering Association has as one of its subjects for investigation, "Branch line electrification, and self-propelled cars and locomotives." This committee has presented much valuable data on the operation of gas-electric cars, particularly in the reports of 1925, 1926 and 1927.

Snow Costs Depend on Kind of Snow

DESPITE the popular belief that the lack of snow is a big help to the financial affairs of a street railway, the Worcester Consolidated Street Railway, Worcester, Mass., has produced figures which lend an interesting light to the situation, revealing that it is not a question of how much snow but what kind of snow.

Costs of snow removal for five years cannot be taken for a barometer of the snowfall, it was found. Some months when there is little or no snow, the snow costs are heavy due to frozen switches, and that dreaded succession of snow, rain and freezing weather.

In December, 1927, which was considered a very open month, the cost of snow removal for the Worcester system was $3,056, less than one-third of the cost for the year before, which was $11,794, but nearly twice as much as for 1925, which was $1,893.

Last year February's snow removal cost was $8,058 and in March $4,098. In 1926 the February cost was $31,235 and March $5,835. In 1925, March was more like a lamb, costing only $343, but February snow cost $8,579. Only once in the three preceding years did the figure for either month fall below $5,000.

Electrification Reduces Smoke Pollution

SMOKE damage to the Chicago Art Institute has been measurably reduced, according to a statement by the superintendent of the Institute, since the electrification of the Illinois Central Railroad suburban service. The through trains are still steam-driven. Approximately 4 tons of soot were taken from the building's roof during 1927, whereas during the previous year 13 tons were removed. The smoke and cinders falling on the roof of the building and seeping inside deface costly paintings, statues and fabrics, and the thin coating which forms on everything results in disintegration. The reduction of smoke pollution is of great value to the Art Institute.

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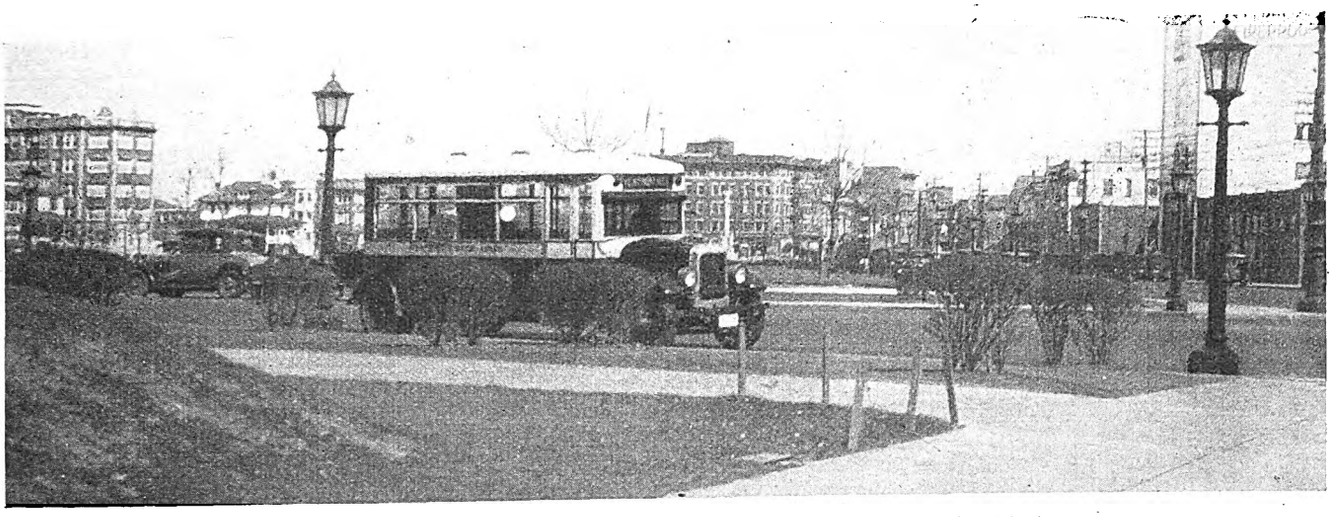

Ventnor Heights bus at Albany and Atlantic Avenues, where connection is made with the street cars

Feeder Bus Service Stimulates Riding

Operation of three routes in recently developed residential districts has brought Atlantic City & Shore Railroad a substantial volume of new business

FEEDER bus service established last summer by the Atlantic City & Shore Railroad, Atlantic City, N. J., has proved a valuable adjunct to the rail lines. Two of the three bus routes operated by this company serve newly-developed residential districts, while the third is partly a replacement of a former car line and partly an extension into new territory.

The geographical arrangement of Atlantic City is unique, lying, as it does, on a narrow strip of sand between the Atlantic Ocean and extensive salt marshes. The railway operates two principal car lines. One is an interurban called the "Shore Fast Line" which starts at the Boardwalk in Atlantic City, crosses the marshes to the mainland and continues thence to Ocean City. The local car route is somewhat L-shaped, about 8 miles long, extending from Absecon Inlet on the north via Maine

Terminal of the Venice Park and Bungalow Park bus routes opposite the Pennsylvania Railroad Station

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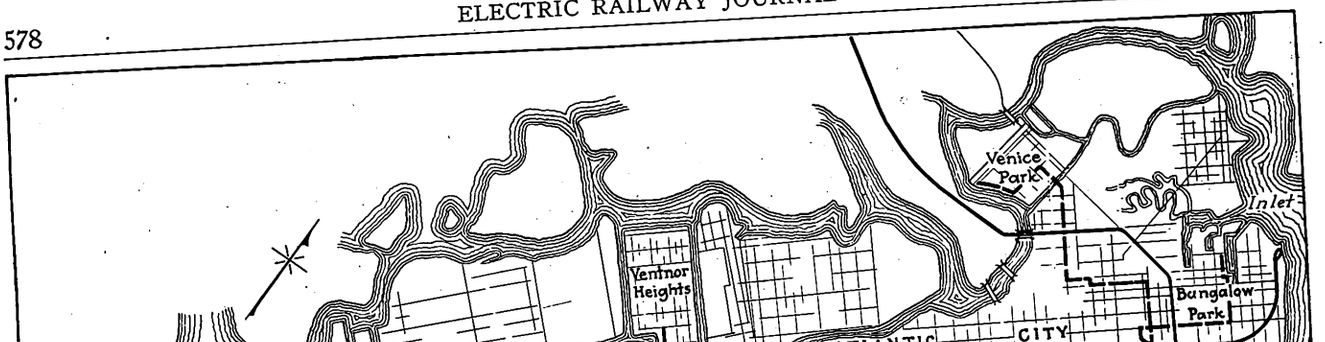


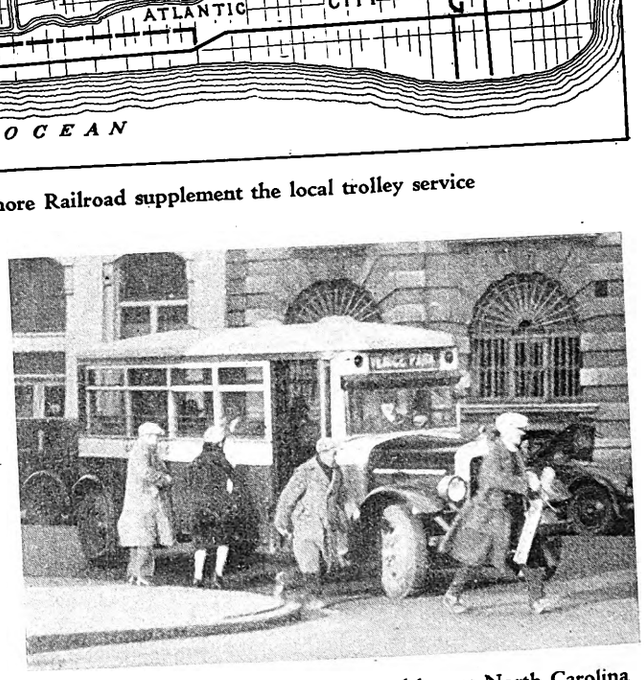
Three bus routes operated by the Atlantic City & Shore Railroad supplement the local trolley service

and Atlantic Avenues to Longport on the south. The center of the business district of the city is about 1½ miles from the northern end of this car line.

Throughout the greater part of its length the city is so narrow that the car line on Atlantic Avenue is within easy walking distance. At its northern end, however, the width is somewhat greater. The short leg of the L of the car line serves a portion of this district, and another car line on South Carolina Avenue formerly served another portion of the territory lying west of Atlantic Avenue. It is this second car line that has been replaced by a bus line, except for a short section between Atlantic Avenue and the Boardwalk, where a shuttle car is operated. The bus line starts in front of the Pennsylvania Railroad Station, west of Atlantic Avenue. A second bus line starting from the same point serves an adjacent district which has been newly developed. These routes are called Venice Park and Bungalow Park. The third bus route, Ventor Heights, is located some distance away. This connects the new suburban district of that name with the car line at Atlantic and Albany Avenues.

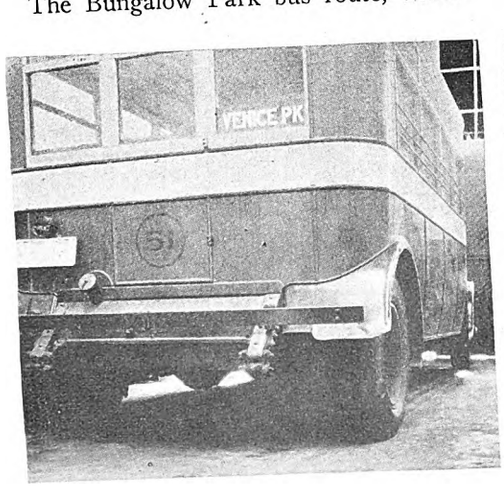
The Venice Park bus route, the most important of the three, began running in May, 1927. In February, 1928, approximately 750 passengers per day were being carried. The route is 2.2 miles long and the running time is thirteen minutes. The schedule speed is 10.2 m.p.h. A total of 167 bus-miles per day are operated on this route.

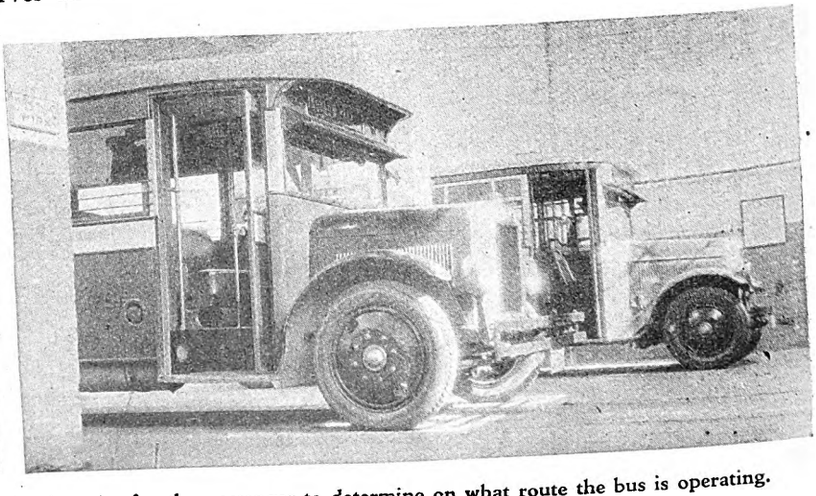
The Bungalow Park bus route, which serves an adjacent neighborhood, was started at the same time. Its length is 1.3 miles and the running time nine minutes. Schedule speed is 8.65 m.p.h. About 280 passengers per day are carried on this route and the buses operate 88 miles.



Passengers alighting from an inbound bus at North Carolina and Atlantic Avenues

The Ventnor Heights bus route was established in September, 1927. At the present time 240 passengers per day are being carried and the buses operate 126 miles. This route is 1.75 miles in length. The running time is eleven minutes and the schedule speed 9.55 m.p.h.





At left—A small sign in the rear window makes it easier for the passenger to determine on what route the bus is operating. At right—When not in service buses are stored in an unused bay in the carhouse

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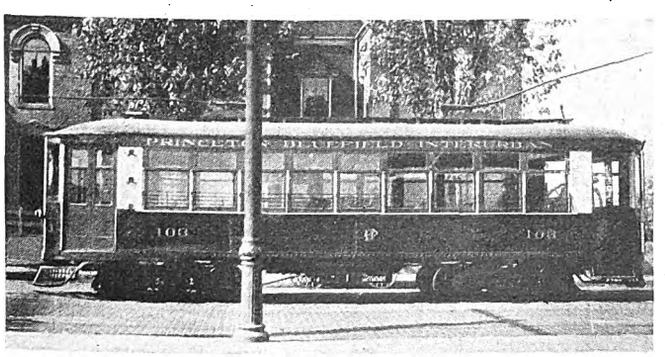
Operations are conducted under the name of the Central Transportation Company. This was derived from the name Central Passenger Railway, an underlying company. Fares on the buses are 10 cents with free transfer to the cars. The car fare is 7 cents and a 3-cent charge is made for transfer to the buses. The revenue per bus-mile averages about 30 cents, while the cost of operation is slightly over 33 cents per bus-mile. It is expected that the revenue will increase as the districts served build up. While these buses act principally as feeders to the rail line, they have actually developed traffic that did not previously exist.

The company has a total of seven buses. Of these, six are 21-passenger Yellow model X buses and one is a 29-passenger Yellow model Z. In addition to the standard equipment of roll signs in front, each bus carries a small route sign in the rear window. This has proved particularly useful because the Venice Park and Bungalow Park lines have their terminal west of Atlantic Avenue in such a location that most of the passengers approach from the rear. The rear sign makes it possible for an approaching passenger to tell whether it is his bus or another which is standing at the terminal.

The buses are housed in one bay of the company's carhouse. Maintenance and inspection work is done in the railway shops. For this purpose the buses are run over the pits in the same way as a car. The work is not done by the regular shop men, however, but by a special group of bus mechanics. When in service buses are operated by former car operators.

Light Interurban Has Good Record

ONE of the first light-weight interurbans to be placed in service anywhere is car 103 of the Princeton Power Company, operating the interurban connecting Princeton, W. Va., Bluefield, W. Va., and Graham, Va. The car, which has been operated continuously since 1917, is still in excellent condition and should remain in service for many years more, according to S. J. Evans,



Light-weight interurban car of the Princeton Power Company which has operated continuously since 1917

president and general manager of the company. It has proved most satisfactory to operators and patrons alike. Its low energy consumption, averaging 0.8 kw. per car-mile, has effected a great saving. Its high rate of speed, 40 m.p.h., is especially appreciated by the patrons.

The car is a 41-passenger combination unit with smoking compartment. It was built by the Cincinnati Car Company, is all-steel, weighs 21,000 lb., and is equipped with Westinghouse No. 506 motors mounted on 26-in. steel wheels.

London Underground Uses Ticket-Issuing Machines

In spite of its zone fares the London Underground has been successful in employing automatic machinery in its fare collection

MECHANISM which is largely automatic is used in a system of fare collection which has been developed on the London Underground System, although zone fares are charged. Originally, on this system, tickets were sold at ticket windows, as on steam railroads. They were printed with the names of the initial and final station and were surrendered by passengers as they left the destination station. This acted as a safeguard against overriding.

The next step, introduced some twenty years ago, was the installation of slot machines for the sale of tickets. Not all tickets were sold by machine, only the denominations most commonly used, as 2-penny and 2½-penny tickets. The others were sold from a window (or booking office as it is called in London). The machines relieved the ticket agents, however, of considerable work and also helped the public by shortening the time of waiting to buy a ticket. Lettering on the machine showed clearly the amount of money which had to be deposited to secure a ticket and the station or stations to which such a ticket would entitle a passenger to ride. Such a slot machine is shown in an accompanying illustration.

These machines, while useful, were of rather primitive design and noisy in operation. In their original form they also were open to fraud by the use of slugs. They served the purpose, however, and many of them, although greatly improved, are still in use. They still require the exact amount of money to be inserted. They do not make change.

The latest type of slot machine in use on the London Underground System will take either the exact fare or will make change if the traveler inserts a 6-penny coin or a shilling coin. It also weighs the coin inserted and tests it electrically for conductivity to determine whether it is spurious, or not. It then prints, dates and issues a ticket instead of taking one from a supply. All this is done at the rate of a ticket a second. There is only one money slot, no matter what the coin or coins that are dropped into it.

It is believed that this type of machine, when generally installed, will greatly increase the use of slot ticket machines, as experience has shown that 90 per cent of all the passengers at the Underground ticket offices are in possession of either copper penny pieces for the fare, or sixpences, or one shilling pieces.

The type of slot machine just mentioned is not the only one being tested out by the London Underground. Three other forms are also in use. One, shown in Fig. 4, is purely mechanical and has the advantage that it occupies less space than that shown in Fig. 3, though it does not make change. Another advantage possessed by a purely mechanical machine is that it can easily be moved from one station to another. Hence, it is especially convenient for use at outlying stations on days when they are to be used by a large number of people, as for a Rugby game or other athletic event.

Fig. 5 shows how five of these machines designed for different rates of fare have been brought together at one station to occupy a circular space only 3 ft. in diam-

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eter. Fig. 6 shows another form of this machine. It is designed to be tall so as to take up very little floor space. It is especially useful in passageways where the room is limited.

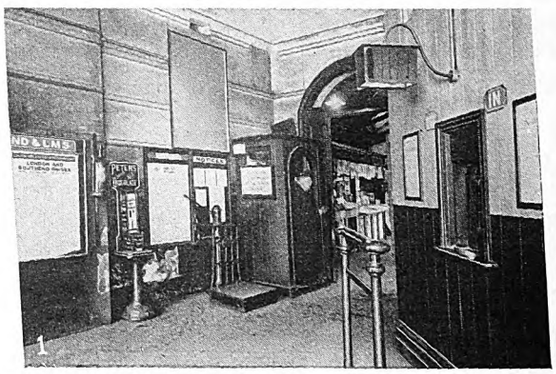
Besides these ticket-issuing machines, the company is testing out turnstiles, or passimeters, on rather an extensive scale. These machines have to differ from those used in the United States, because in addition to registering the fare they have to issue a ticket showing the destination to which the fare is paid.

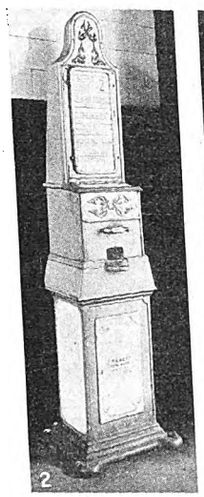
One of the latest turnstile designs is illustrated in Fig. 7. If the passenger drops two pennies in the slot of the 2-penny passimeter, he will receive his ticket printed and dated. At the same time the turnstile is automatically released, thus providing admission to the train platform. If a 6-penny or a shilling coin should be dropped in the slot the same procedure is followed except that the passenger also receives his proper change.

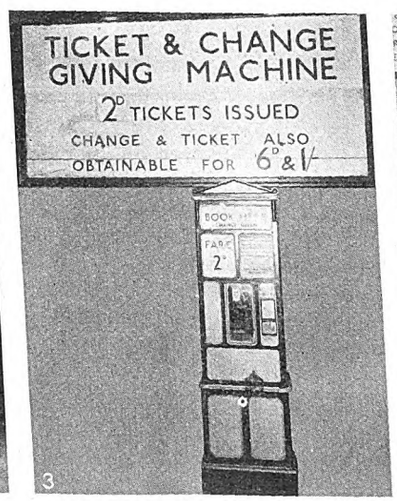
Still another form of passimeter station is shown in Fig. 8. Here, as the passengers pass through the station, pay for and receive their tickets, they are registered on meters in the ticket office. With this system, as well as with the passimeter illustrated in Fig. 7, the inspection of tickets, which has to be done with all the other plans, is dispensed with except for holders of season tickets and return tickets. These represent only about 20 per cent of the traffic.

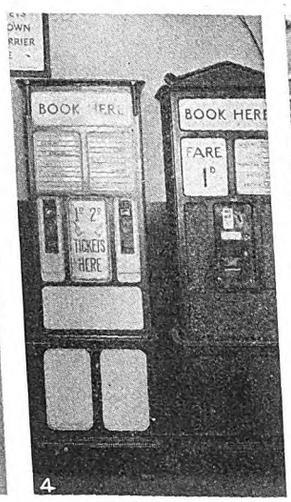
The latest office ticket issuing machine in use on the London Underground is shown in the final engraving, Fig. 9. This machine, which is also used with a passimeter, prints, dates and numbers the ticket from plain rolls of paper, and has a capacity of four tickets per second. It is primarily intended for the issue of tickets of the less common denominations, i.e., tickets which have to be issued from an office.

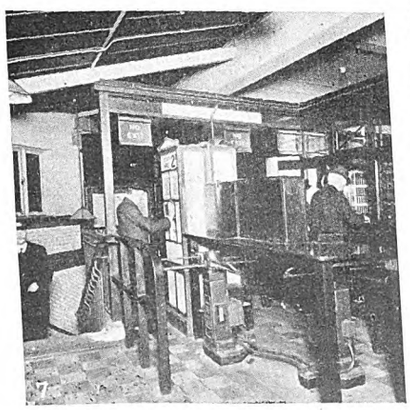
The clerical staff much prefers this machine to the former plan where tickets had to be taken out of the case one at a time. In fact, the work is so much easier that it has been found practicable on the deep underground lines to locate the electrical switches which control the elevators to the station platforms in the ticket office.

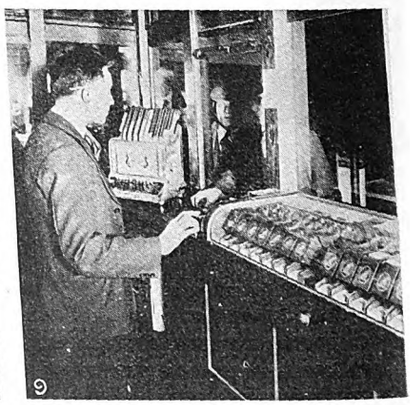












Old and new ticket-selling and fare collection methods on the London Underground railway system

1. The earliest method used in London, where tickets were sold at a window and punched at a barrier.
2. First ticket-issuing machine.
3. This machine issues 2-penny tickets and gives change for larger coins.
4. This double machine issues 1-penny or 2-penny tickets and is mechanically operated. It does not make change.
5. Several automatic machines grouped in the form of a kiosk.
6. A high design with small floor area for narrow passageways.
7. The passimeter and change-making machine which dispenses with both ticket seller and ticket puncher at entering stations.
8. Through type of passimeter station.
9. Ticket printing and issuing machine for office issue, used in conjunction with passimeter.

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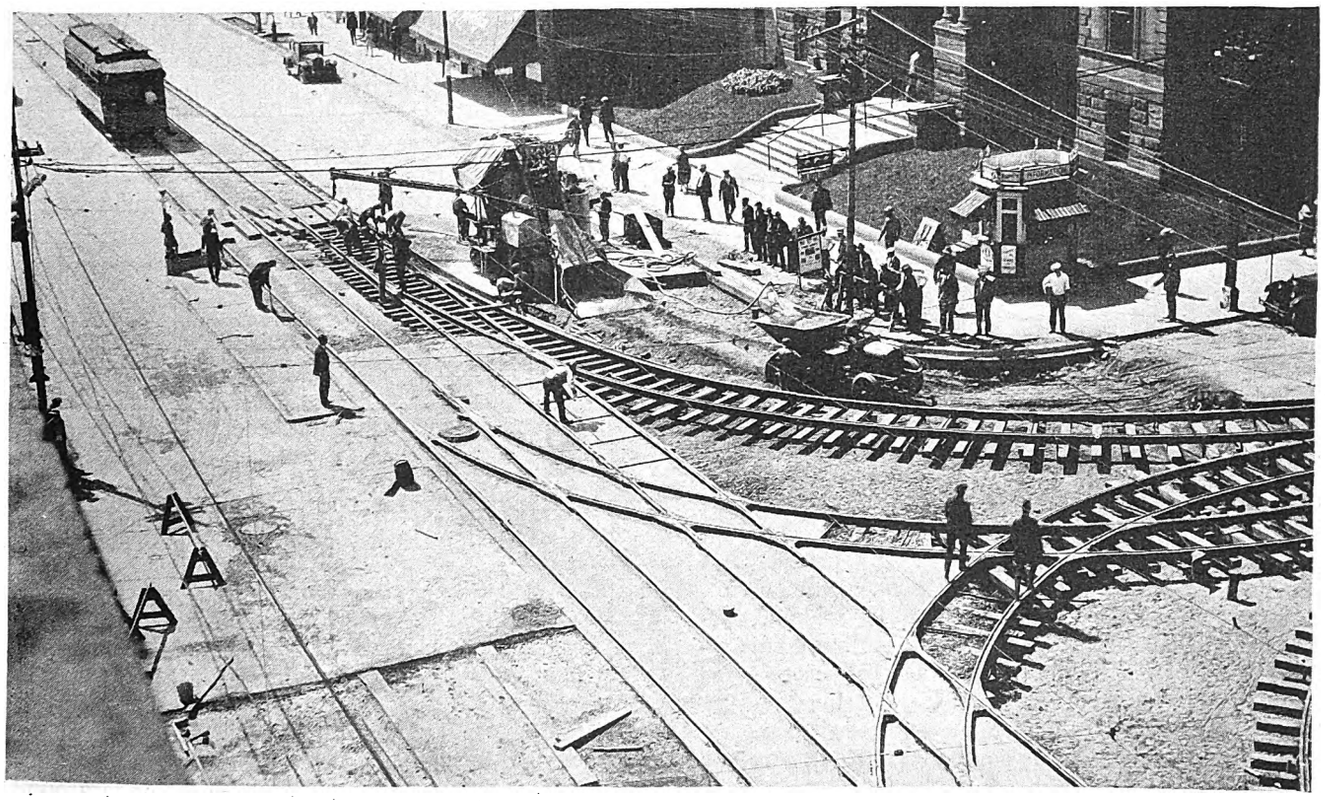
Pontiac, Mich.,
Improves Its Principal Street

Extensive program involves widening and repaving of Saginaw Street and the relocation and rebuilding of 1½ miles of double track



Street car service was uninterrupted during the construction. One track was poured at a time and operation continued on the other track

INCREASING traffic needs caused the city of Pontiac, Mich., to adopt an extensive program of street widening and opening, the major part of which was the widening and rebuilding of Saginaw Street, the principal business thoroughfare and a continuation of Woodward Avenue of Detroit. The improvement, described in an article in *Engineering News-Record*, involved not only the repaving and the complete rebuilding of 1½ miles of main thoroughfare, but also the removal, relocation, rebuilding and repaving of more than 1½ miles of double-track street railway.

In the rebuilding of the street the Detroit United Railway, which operates both the local transportation system and the interurban service to the city of Detroit, completely rebuilt its double-track line. The condition of the rails and ties did not warrant their use in the type of new construction demanded by the city. On about 2,000 ft. of street in the business section there existed three tracks, all of which were in poor condition. The plans for rebuilding eliminated one track and called for a new double track in the center of the street. This rebuilding of the street railway system is the more interesting since the franchise for the Saginaw Street line expired on May 17, 1927, and on May 24 a day-to-day agreement was entered into, whereby the street railway company agreed to a number of things, chief of which was the rebuilding of its tracks under city specifications, supervision and inspection.

Plans Prepared in City Engineer's Office

All plans and specifications for the new construction, with the exception of special-work layouts, were prepared under the direction of the city engineer and approved by the street railway, of which J. M. Mudie is chief engineer. G. J. Wagner & Company, consulting engineers, of Grand Rapids, Mich., retained as consultants on transportation matters, acted in an advisory capacity on plans and specifications and helped supervise construction of the tracks.

The trackwork consists of 6-in. 100-lb., A.R.A.(A) rails, with thermit-welded joints. The ties are sawed white oak, 6x8 in., 6 ft. 8 in. long, 2 ft. c. to c. and cased

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Safety zones and platforms were installed at all important street railway stops in the business district

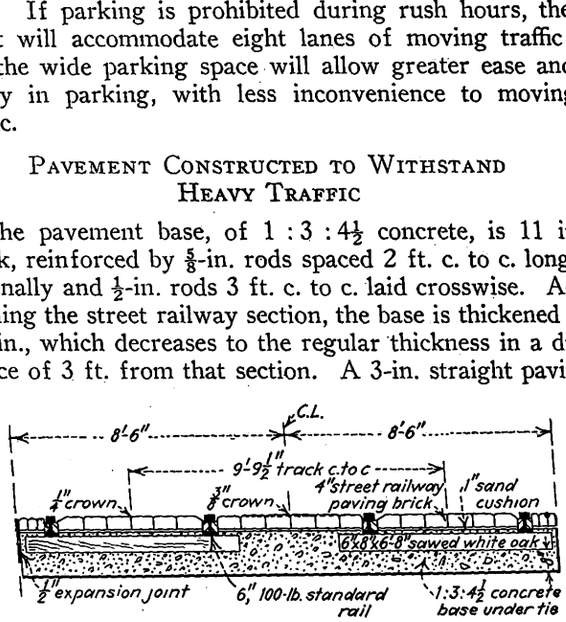
in a monolithic mass of concrete extending from 8 in. below the ties to 1 in. above them. The paving consists of 4-in. wire-cut paving brick laid on a 1-in. sand cushion and having the joints poured with asphalt filler. Rail filler was used with all regular T-rail sections, together with a special brick nose-block. The concrete was designed for a minimum strength of 2,500 lb. per sq.in. at the end of fourteen days. Actually the test cylinders averaged 2,788 lb. at that time. A carefully proportioned aggregate was used, consisting of a 1 : 3 : 4½ mix, with the mixing time not less than two minutes. The concrete was placed as dry as possible consistent with workability.

In construction, one track was poured at a time and car service was given over the other until the concrete had attained the desired strength. This required not more than fourteen days, as shown by compression test cylinders. In a few instances, where it was impossible to discontinue service, each tie was well blocked and concrete of a richer mix and longer mixing time poured to within 1 in. of the bottom of the ties. When this had attained sufficient strength the track was relined and reblocked with shims resting on the concrete and the remainder of the concrete was poured. Where this method was used, the base concrete attained a strength of 2,500 lb. after four days and showed no sign of disturbance from the uninterrupted service.

For the 120-ft. right-of-way an 80-ft. pavement was designed, with a 20-ft. sidewalk on each side. This provides for the double-track street car line, four 10-ft. lanes for moving traffic and two 10-ft. lanes for parallel parking. The wide parking space was provided for two reasons: If parking is prohibited during rush hours, the street will accommodate eight lanes of moving traffic; and the wide parking space will allow greater ease and safety in parking, with less inconvenience to moving traffic.

Pavement Constructed to Withstand Heavy Traffic

The pavement base, of 1 : 3 : 4½ concrete, is 11 in. thick, reinforced by ⅝-in. rods spaced 2 ft. c. to c. longitudinally and ½-in. rods 3 ft. c. to c. laid crosswise. Adjoining the street railway section, the base is thickened to 14 in., which decreases to the regular thickness in a distance of 3 ft. from that section. A 3-in. straight paving guard doweled to the base forms a division between the asphalt surface and the street railway brick paving. That paving is completely separated from the street pavement by a ½-in. expansion joint extending from the surface to the subgrade.



The ties are cased in a monolithic mass of concrete. Four-inch paving bricks are laid on a 1-in. sand cushion

During the rebuilding of the street the interests of the merchants and business men were held of paramount importance. All underground work was carried on without closing the street, and the work was confined to limited areas until finished. All backfilling from excavations was mechanically tamped in thin layers. In some instances additional dirt had to be supplied to fill the trench completely, showing that a compaction had been secured greater than that of the original soil. By keeping the various activities spread apart no portion of the street was closed for any great length of time, although it was necessary to barricade the same area more than once. The various operations, involving excavation, curb and gutter, concrete base and asphalt surface, followed in quick succession.

Traffic is so heavy and constant that safety zones with platforms were installed at all

The Saginaw Street improvement included the complete reconstruction of 1½ miles of double track

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important street railway stops in the downtown district. These zones, one of which is illustrated, are of the raised concrete type, having a protective curb and iron railing with a splash apron and caution light at the end of each zone. All important street crossings are protected by stop lights, the timing of which is progressive. In addition to the lights, the crossings have galvanized metal markers, and it is hoped that these, in conjunction with the lights, will discourage jay-walking and minimize traffic accidents.

An interesting feature of this 1½ miles of street rebuilding is that the only poles will be combined light and trolley-span support poles 120 ft. apart. These poles are of fluted steel with old-bronze lacquered finish and are 23 ft. high. Each pole carries an ornamental cross-bracket supporting two 600-cp. lamps. Before adopting this pole exhaustive tests were made at the manufacturing plant, which showed that it corresponded in deflection to a 6-7-8 in. tubular steel pole weighing 887 lb., except that the safe load on the fluted pole was 3,500 lb., as against 1,544 lb. for the tubular pole. Under a load of 2,000 lb. the deflection was only 5¼ in.; at 4,000 lb. it was 11⅝ in. and upon removal of the load the pole returned to within ⅜ in. of its original position. The vibration tests also were satisfactory.

Des Moines Reduces Fire Insurance Cost 44.4 Per Cent

By O. H. Bernd
Secretary the Des Moines City Railway, Des Moines, Iowa, and Member Insurance Committee American Electric Railway Association

SINCE Nov. 13, 1923, the Des Moines City Railway has reduced its insurance costs $6,315 per year, or 44.39 per cent. In other words, the average rate has been reduced from 47.3 cents per $100 to 26.3 cents per $100 of insurance.

Early in January, 1924, the insurance was placed on a three-year term, at 2½ times the annual premium, effecting a saving of approximately $2,300 per year.

The company then directed its efforts to the matter of housekeeping. All of the recommendations made by the local insurance rating bureau, in co-operation with its affiliated organizations, which did not involve any considerable expenditures, were carried out. All wooden lockers for workmen were replaced by approved steel lockers equipped with slanting tops to prevent the storage of any articles on top. Old waste cans were replaced with new approved types and properly distributed throughout the shops and carhouses. Additional fire extinguishers and sand pails were placed in accord with bureau recommendations. All dead or abandoned electric wiring was removed from the various carhouses. In addition to these physical improvements, the program included a general campaign among workmen to induce them to keep their work places clean and free from accumulations of rags and rubbish, resulting in a marked improvement in the performance of their work.

The company has recently completed the installation of automatic sprinkler systems in its car shops and one of its two carhouses. The second carhouse is a temporary frame building, and does not warrant the expenditure necessary to equip it with a sprinkler system.

These automatic sprinkler systems were installed at an approximate cost of $16.900. As an offset to this expenditure, there was received by the company in return premiums, on account of the reduction in rates, the sum of $8,484, so that the actual cash outlay for these sprinklers was less than $8,500.

The total annual insurance saving effected by them is $3,636. The largest saving is in the car shop. This is a one and two-story brick and concrete building with composition roof, erected in 1904 and partially rebuilt following a fire in 1912. Before the installation of sprinklers the average rate for this building and contents, except rolling stock, was $1.291 per $100, while the present rate is 22.4 cents per $100 of insurance, effecting an annual saving of approximately $2,668.

The carhouse, which was equipped with automatic sprinklers, is of brick with composition roof, and has a storage capacity of 45 passenger cars. While the average rate on this building and contents, except rolling stock, was reduced on account of the sprinkler installation from 76.4 cents to 28.3 cents per $100 of insurance, the annual saving effected is but $230, as only $48,000 insurance is carried on the building and contents, except rolling stock.

The sprinkler installation in the car shops and carhouse resulted in an insurance saving on the company's rolling stock of $747, or approximately 10 per cent—a substantial saving, when it is considered that the combined storage capacity of both car shops and carhouse is but 53 passenger cars, or less than one-third of the company's rolling stock.

In addition to the direct savings on insurance premiums we consider the sprinklers a good investment because of the protection they afford, as a serious fire in a carhouse or shops might easily result in crippling the service and prove more costly than the sprinkler installation.

School for Arc Welders

FOR MANY years a school of welding has been conducted in the shop of the Lincoln Electric Company, Cleveland, Ohio, but just recently it has been reorganized and re-equipped. No tuition or fees are charged. The equipment includes a number of standard 200 amp. Stable-Arc welders installed in line with a series of booths in which the pupils work. All wiring except the necessary leads to the electrode holders are in conduit and the floor space is kept clear. The individual compartments are curtained by heavy material.

A 30-day course is given in twelve lessons which include the following: (1) The contact of the arc, its characteristics and manipulation; (2) the nature of welding rods and depositing materials; (3) the operation and care of the welding machine; (4) the nature of vertical and overhead welding; (5) testing welds for porosity and strength; (6) welds on cast iron and their percentage of strength; (7) the advantages and future of carbon arc welding; (8) welding of copper and bronze castings; (9) the use and abuse of pressure welding; (10) the assistance to the human element in Stable-Arc welding rods; (11) the construction of welded machine tools; (12) the simplicity and strength of welded fixtures.

Pupils work under the direction of a trained inspector who teaches them both as a class and as individuals. With 30 days intensive training men are able to acquire a sound working knowledge of the fundamentals of electric arc welding, and are fitted to engage competently in the trade.

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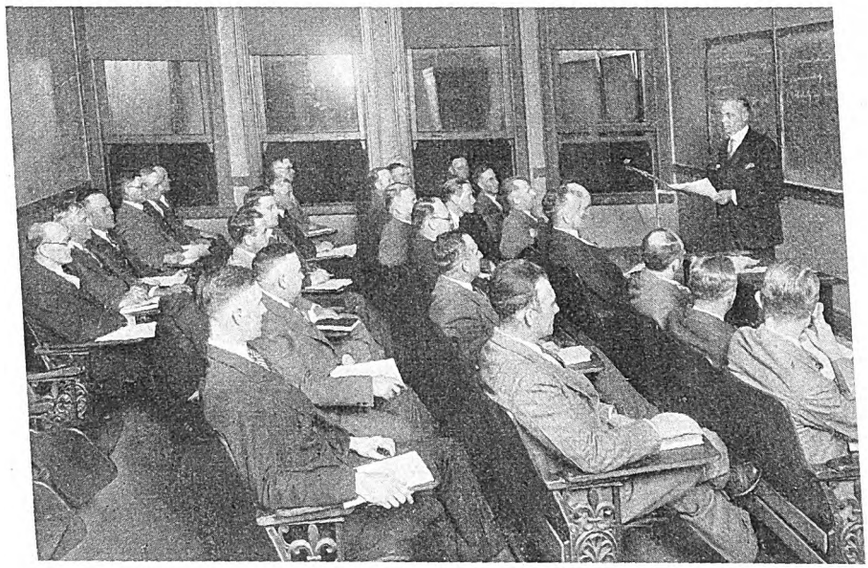
Pacific Electric Has Balanced Educational Program

Los Angeles Board of Education furnishes paid instructors for the classes. More than 2,000 men and women enrolled in four years

THAT a well planned educational program for employees of public utility corporations can be carried on with advantage both to workers and the management is demonstrated by the experience of the Pacific Electric Railway of Los Angeles, Cal. The success that has been achieved by this large interurban railway system is evidenced by the present enrollment of more than 600 employees, and by the total enrollment of more than 2,000 men and women in the four years since the plan was inaugurated.



An interested group of Pacific Electric employees in one of the class rooms at the company's headquarters in Los Angeles

One of the discouraging elements for public utilities conducting educational work on a large scale is the prohibitive cost often involved. The Pacific Electric, however, has reduced the cost so that it is negligible compared to the results achieved, by co-operation with the city's educational board. When inaugurated four years ago under the direction of Earl W. Hill, appointed educational director, the only class was one of traffic management. Interest grew and results from this first effort were so satisfactory that broadening of the program and problems incident thereto were discussed with the Los Angeles Board of Education. The school authorities were deeply impressed with the interest created, and promised aid to the movement by furnishing paid inspectors in any class when attendance of fifteen students could be maintained. Thus encouraged, the educational director began broadening the program.

Two rooms located in the Pacific Electric Building were set aside for exclusive use as class rooms. Desks, blackboards, typewriters, books and other equipment were supplied by the company. Interest of employees was stimulated through the columns of the company's monthly magazine and by encouragement from departmental heads. The work done in this regard, however, was more of an advertising nature, it soon being learned that, given a bit of encouragement, there is an inherent desire in the average individual to broaden his knowledge. With the program well established, there has been no lack of interest on the part of employees; on the contrary, over-enrollment has become the problem frequently.

At present seven studies are being taught, six of which are presided over by teachers supplied by the Board of Education. The subjects are traffic management, personal leadership, public speaking, mathematics, business English, shorthand and typewriting. The classes are held in the afternoon from 4:45 to 5:45 and in the evening from 7 to 9.

Incentive to complete the courses is stimulated by issuing diplomas to those who attend regularly and successfully complete their studies. Furthermore, each employee is advised that his respective department head will be notified of the awarding of a diploma, and will be told of the employee's desire to improve.

Inasmuch as the Pacific Electric operates in four counties and its employees reside in widely scattered districts, the educational director has another duty to perform. He keeps in close touch with and knows the various studies available at all the institutions of learning within the district. Employees are urged to consult with him and he in turn recommends the school where their needs may be cared for best. Approximately 500 employees are placed in schools over the system through contact with Mr. Hill. Reports are furnished to the educational director from the school superintendent, the procedure lending encouragement to the students.

The interest manifested by the employees is exemplified in a recent class in personal leadership which had an attendance record of 98.5 per cent, and for which applications exceeded the capacity of the school room by 50 per cent when the class was reorganized.

Port Arthur Grants New Franchise

SEVERAL interesting provisions are contained in the franchise granted Jan. 11, 1928, by the city of Port Arthur, Tex., to the Eastern Texas Electric Company. The life of the franchise is 50 years. The clause on fares provides that the single fare is to be 10 cents. Tokens are to be sold at three for 25 cents, and weekly tickets for 40 cents, with an additional payment of 5 cents per ride. The franchise declares that in the future, the city may "fix and regulate a fair price for the service to be performed under this franchise." On the other hand, the railway has the right to abandon any line or lines which do not give fair returns on their valuation, or it may abandon a line on any street about to be repaved, if it desires to do so. If any change is made in the grade of any street the city must bear the cost of making the railway tracks conform to the new grade. The company pays $25 a year annually to the city as reasonable compensation for this franchise.

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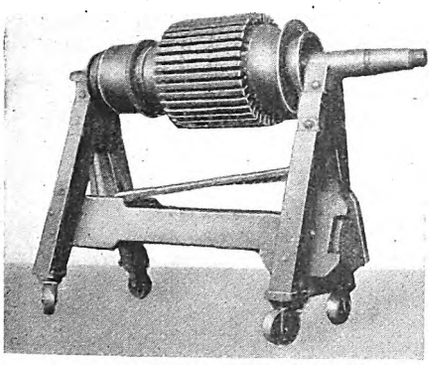
Maintenance Methods and Devices

Adjustable Armature Winding Stand

SOMETIMES it is advantageous to have adjustable, movable armature winding stands in a shop. In the armature shop of the Binghamton Railway, Binghamton, N. Y., armatures of various sizes are in service which require different pedestal centers for mounting on the winding stand and shop conditions require



Convenient type of adjustable armature stand

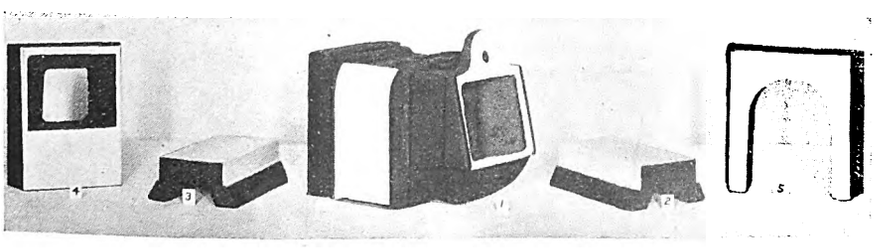
frequent movement of the armatures to make room for other work. The stand shown in the accompanying illustration was designed to meet this condition. The A pedestals of this stand, which are 32 in. high over all and 22 in. wide, are made of 2¼-in. x 4-in. oak, reinforced and bolted together, and equipped with 3-in. x 1¼-in iron swiveled wheels. One end of a 1-in. x 4-in. plank is bolted to either side of the inside of each leg of the stationary pedestal and the other end enters a guide on the movable pedestal formed by bolting two 1-in. x 2-in. oak blocks on the inside of either leg of the movable pedestal. This permits one pedestal to be moved toward or away from the stationary pedestal to accommodate the various sizes of armatures. A safety latch is also provided to prevent the movable pedestal from passing beyond its maximum safe limit.

Life of Journal Boxes Increased by Chilling

WEAR on journal boxes comes principally where the truck pedestals make contact. The pedestal gibs can be replaced easily when they wear, and they are not expensive. The wear on the journal boxes, however, cannot be taken care of so easily, and frequently this becomes so excessive as to cause a large amount of lost motion in the trucks. Finally the box is worn through to the oil chamber in the bottom, particularly where cars operate on streets paved with chert or slag.

To overcome this trouble the Birmingham Electric Company, Birmingham, Ala., uses journal boxes chilled with a cast-iron chill in the mold. Some of these have been in service five years and show little wear, while soft gray iron boxes do not last more than three or four years. The use of chills for the journal boxes at the point where the pedestal comes in contact was found so successful that it was decided to carry the chilling still farther. Now the boxes are chilled where the cover fits on and also at the back where the box goes over the axle. This not only gives a much better casting but eliminates all machine work.

Referring to the accompanying illustration the part marked 1 shows the journal box with the chill surfaces painted white. Parts 2 and 3 are the chills used in the pedestal ways. Part 4 is the chill used where the cover fits and part 5 is the chill used for the back of the box where it goes over the axle.



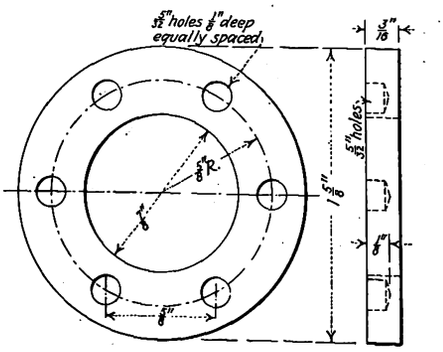
1. Journal box with chilled surface painted white.
2 and 3. Chills used in pedestals.
4. Chill used where cover is applied.
5. Chill for back of box where it goes over axle.

A careful check of these journal boxes made with chilling shows that they are just as accurate to dimensions as if they had been machined and the life is increased considerably while the cost of machine work is eliminated.

Sticking M-28 Brake Valves Cured

By G. E. Graubner
Foreman Cincinnati Street Railway, Cincinnati, Ohio

CONSIDERABLE trouble has been experienced on the Cincinnati Street Railway with M-28 brake valves becoming stiff. The cause was that the leather key washer gripped



Details of key washer made from babbitt metal and turned to exact size in lathe

the brass seat in the valve casting after a few applications of air. After trying various kinds of oils, greases and compounds without much success, we hit upon the idea of making these key washers out of babbitt metal and turning to size in a lathe. These washers are made the same diameter as the leather washers but they are $\frac{3}{16}$ in. thick instead of $\frac{5}{32}$ in. Six $\frac{5}{32}$-in. holes were then drilled $\frac{1}{8}$ in. deep, spaced equally around the face. These holes were filled with graphite plugs, made by melting a good grade of No. 3 cup grease and stirring in as much finely ground graphite as it would hold. The valves receive their regular greasing at each "B" inspection, at intervals of 900 car-miles, at which time they are taken apart and greased thoroughly with a good grade of No. 3 cup grease. Some of these washers have been kept in use for more than four months without showing any signs of stiffness on valves that previously had given much trouble.

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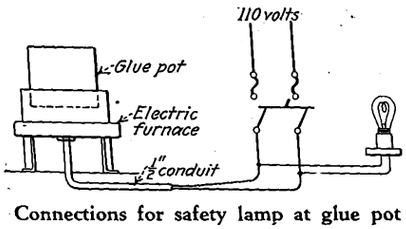
Safety Lights Warn and Save

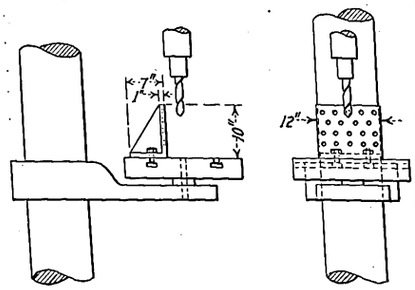
SAFETY is of prime importance in the shop of the Binghamton Railway, Binghamton, N. Y. Here all machines are guarded carefully to prevent accidents and the shop organization receives intensive instruction in the advantages of playing safe at all times. An indicating or warning light is installed wherever electricity is used for heating solder, glue, etc., or where there is a possibility of damage being done if the men forget to turn off the current. The lamp burns continuously while the current is on the machine. The accompanying sketch shows how a lamp is connected across the terminals of an electrically heated glue pot inside the switch so that when the switch is opened the light is extinguished. It acts as a warning to the men that the current is on and can be observed readily from nearly any angle of the shop. At the close of the day it is easy to see at a glance whether or not all of the circuits have been disconnected.



Connections for safety lamp at glue pot

Lever Support and Safety Stop for Drill Press

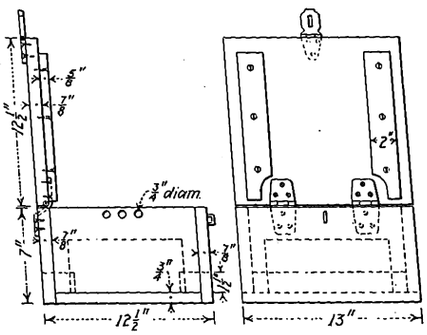
SPEED of production is considered of prime importance in the Woodside shops of the New York & Queens County Railway, Long Island City, N. Y. A large amount of drilling of small pieces is often necessary. Formerly it was the practice to align and clamp each piece to the drill press table. This clamping and unclamping took considerable time and resulted in low production. A casting was made up to eliminate this work. It was designed to be bolted to the drill press table. The face is drilled with numerous $\frac{5}{8}$-in. holes, which are used to anchor one end of a lever held by the operator to hold the work in position without clamping. This bracket also acts as a safety stop if control of the piece being drilled is lost. A noticeable saving has been effected by this simple casting.

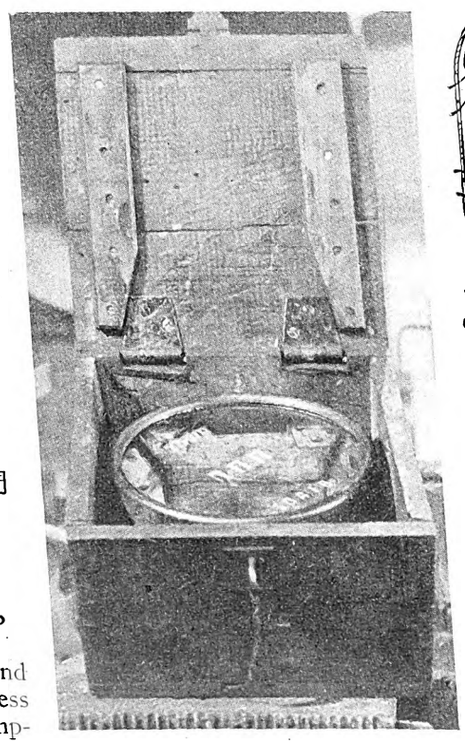


Drill press lever support and safety stop

Protecting Fare Registers from Injury

FARE registers on the New York & Harlem Railroad, New York City, are changed on a definite time basis and repairs and tests are made at the shop. Most of them are changed at the inspection houses which are located at some distance from the shop. They are transported to and from the shop in a supply car. The car transports all kinds of material at the same time and it is found necessary to protect the registers against mechanical injury. This is being done by placing each one in a specially designed box. The box is made of $\frac{3}{4}$-in. and $\frac{7}{8}$-in. oak and is $12\frac{1}{2}$ in. wide, 13 in. long and 7 in. deep. It is designed with a substantial, hinged cover and provided with a hasp and staple to permit locking. Movement of the registers within the box is prevented by suitable blocks properly spaced and fastened to the bottom of the box. Three $\frac{3}{4}$-in. holes bored near the top of each side board provide a means for lifting.



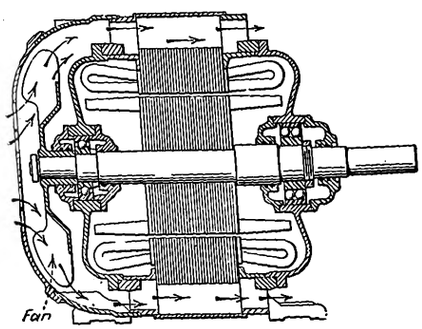


Protective casing for transporting fare registers

New Equipment Available

Air-Jacketed Motors for Dusty Locations

PRESENCE of dust, fumes and moisture in excessive quantities makes the use of standard electric motors undesirable. For such places an air-jacketed motor has been developed by the Wagner Electric Corporation, St. Louis, Mo. The entire motor is surrounded by a jacket open at both ends. Fan blades on the shaft extension between the sealed motor and its outer jacket draw air around the motor. The interior of the motor is virtually sealed, even the bearing housings being closed so that no impurities can get past the grease packing.



Cross-section of motor showing ventilating arrangement

No changes have been made in the electrical principles of the motors themselves, the only changes being external. The frame housing, the motor proper and all bearings are substantially air-tight. The end shield is made of cast iron. It is rib-reinforced and has a substantial grating which protects the fan and provides an opening for incoming ventilating

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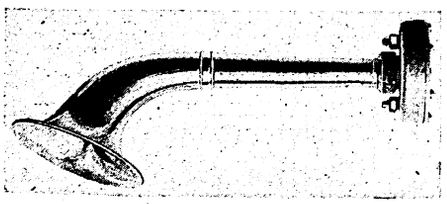
air. The center shield is made of heavy sheet steel held in place by slot-head bolts. The fan is built in one piece. The conduit box is mountable in four positions.

The ball bearings are grease lubricated and sealed in dust-proof housings. The shafts are made slightly longer than those for standard motors to permit mounting of the fan.

Harmonious Tone to New Horns

"PNEUMOPHONIC HORN" is the trade name of a warning signal device being marketed by the Westinghouse Air Brake Company, Wilmerding, Pa. It has a clear, harmonious tone which is distinguished easily from other right-of-way noises. It uses little air and, as it requires no special reducing valve, operates successfully over a wide range of pressures and is of sturdy and durable design. The diaphragm or vibrating unit inclosed in a cast base is a substantial phosphor bronze disk uniquely balanced by a small weight. The bell of the horn is highly burnished, heavy-gage instrument brass.



Warning horn

This horn is available in various types and sizes to obtain different tonal qualities and in combinations for producing a pleasing chime effect.

Portable Lighting Unit

MANY advantages are claimed for a powerful portable acetylene flare lamp which has been added to the line of the Oxweld Acetylene Company, New York, N. Y. It is intended for night construction work and subway or tunnel building.

The fuel used is produced from Carbic, supplied in the form of cylindrical cakes of uniform size. Enough to operate the flare continuously for twelve hours can be placed in the lamp at one charging. If the use of the lamp is discontinued before the entire charge is used, the portion remaining can be left in the holder, or, being dry, solid and clean, can be slipped back into the drum for use later.

This flare is planned to operate in all climates and in all weathers. It has a storm-proof burner, permitting its use even in the most violent gales. Construction is rugged and simple. There are but three parts, and these cannot be assembled incorrectly. Charging requires only a few minutes' time of one man. When put in operation the lamp needs no further attention until the charge is exhausted.

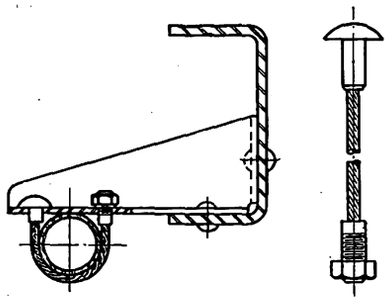
An automatic feed allows water to come in contact with the lowest cake of Carbic until sufficient acetylene is generated to drive the water out of the gas bell to a level below the bottom of the cake. This process is repeated as needed and gas is maintained at a pressure less than 1 lb. per sq.in. The Carbic never rests on a pad of sludge since the residue settles to the bottom of the water. If the lamp is upset accidentally, the water runs out of the container and gas generation stops immediately.

The Carbic light is available in several styles, which range in size from a hand lamp to the 8,000 cp. "Standard" model, which weighs 36 lb. empty and 115 lb. charged and stands 6 ft. 7 in. high with reflector raised. A double burner model, which illuminates in two directions, is furnished in about the same size as the "Standard" model.

Flexible Bolt Developed

DEVELOPMENT of the pre-formed type of rope makes possible attachment of fittings so that they become an integral part of the rope. For this purpose the American Cable Company, Chicago, Ill., has brought out a flexible bolt, which can be used to advantage for fastening piping, conduits or other equipment on cars where ordinarily a rigid U-bolt might be used.

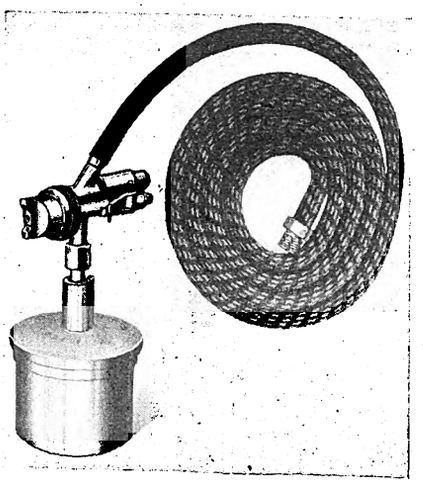
Pre-forming the wires and strands of the rope to the exact helical shape that they must assume in the completed rope results in a cable that does not require seizing and may be cut like a rod. This type of rope permits a close-fitting attachment to be slipped over the unseized end of the rope and to be processed so that the steel of the fitting cold flows into the interstices of the rope and thus becomes practically an integral part thereof. Such fittings can be capped for a head and threaded for a nut.



Method of attaching conduit by means of the flexible bolt

Touch-Up Spray Gun

FOR USE in painting where a fine spray is required the Alexander Milburn Company, Baltimore, Md., has recently developed a new touch-up gun. The extremely fine mist, or spray, procured with this gun is desirable for blending of colors on any surface, touching up scratches, mars or dents, stenciling and numerous other fine painting operations, using lacquer, varnish or other finishes.



Touch-up spray painting gun

The new gun is quick in operation, is well balanced, has a stable base and is handled easily. Slight pressure on the trigger produces a very fine mist, so compeltely atomized that the color is blended with the surrounding painted surface. The gun can be adjusted to procure a hair-line spray for the finest kind of work. It is designated as K-Jr.

Six feet of air hose, with connections, are furnished with the gun. Various containers, either aluminum or glass, can be furnished so that many different colors can be kept on hand ready for use. Each container can be had with an air-tight cap so that paint can be kept in condition while in the cup. Aluminum cups are 8 oz. size; glass containers, 8, 16, and 32 oz. sizes.

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American Association News

Executive Committee Meets

REPORTS of the several standing committees of the American Electric Railway Association, made to the executive committee at its regular meeting at association headquarters on March 30, indicate progress in the formulation of plans for the 47th annual convention in Cleveland next fall. A tentative outline of the convention program submitted by Chairman Frank R. Coates and a report by J. H. Alexander, chairman of the exhibit committee, were received and approved. The executive committee also discussed developments in national legislation of interest to electric railways and reviewed the status of association membership and finances.

Those present at the meeting included the following: R. P. Stevens, L. S. Storrs, J. R. Fitzpatrick, H. E. Weyman, Adam Meyer, G. C. Hecker, J. S. Kubu, S. J. Cotsworth, R. I. Todd, E. F. Wickwire, D. W. Snyder, Jr., W. H. Sawyer, Edward Dana, Labert St. Clair, F. C. J. Dell, John A. Miller, Jr., E. J. Murphy, Leslie Vickers, F. R. Coates, T. W. Casey, C. E. Morgan, G. A. Richardson, Charles Gordon, E. P. Waller, M. B. Lambert, T. A. Kenney, C. R. Ellicott and J. W. Welsh.

At the suggestion of C. E. Groesbeck, A. S. Grenier of the Electric Bond & Share Company was elected a member of the executive committee to fill the unexpired term of Mr. Groesbeck.

Report of the finance committee by Chairman T. A. Kenney indicates that dues received from member companies are within the budget estimates and that the process of absorbing directly in the dues of the association the expenses formerly covered by special assessments is proceeding satisfactorily in accordance with the plan in view when the constitution was changed last fall.

Work of the committee on publicity was outlined by J. W. Welsh in the absence of Chairman Paul Shoup. Mr. Welsh said that the advertising section of the association has aided several railways in the preparation of local advertising campaigns. Posters and booklets have been distributed to operating companies as aids in the merchandising of transportation. The moving picture films entitled "Wheels," "Readiness to Serve," "Mr. Auto Rider Becomes Mr. Car Rider," and "Fashion Show of Local Transportation" have been shown in a total of 508 places during a period of four months.

Convention Plans Discussed

The general subject of "Economics of Transportation" is contemplated for the first day's program of the Cleveland convention, according to the report of Frank R. Coates, chairman of the program committee. The second day will be devoted to the subject of modernization, the third day to outside viewpoints of the transportation industry. It is planned to devote Thursday's program to a discussion of the national aspects of the association's activities. Widespread interest in the luncheon meetings last year indicated the desirability of continuing this plan for the coming convention. Subjects contemplated for these luncheon meetings include rates of fare, interurbans, traffic, financing, taxation, management, employee relations, advertising, bus operation, and car design. It was suggested during the meeting that a luncheon session be devoted to the discussion of manufacturing problems in the industry. Another suggestion was that the time for serving luncheons be cut down this year so as to make more time available for the discussion of the several subjects. The general plan of the program committee was approved by the executive committee.

L. S. Storrs, managing director, who has returned to his duties after a period of illness and a trip to the Pacific Coast, reported for the committee on national relations in the absence of Chairman J. H. Hanna. Mr. Storrs outlined content of bills pending in Congress which affect electric railways. These include a bill defining the difference between commercial electric railways and street and interurban railways, which would take the latter out from under the jurisdiction of the Interstate Commerce Commission. This bill, introduced by Representative Johnson, is H. R. No. 12108. A bill to regulate interstate buses, introduced by Congressman Parker and known as H. R. No. 12380, seems to be receiving the approval of all parties interested in the interstate bus situation, according to Mr. Storrs, and shows promise of being passed at this session of Congress. The managing director supplemented his report for the committee on national relations by briefly reviewing his trip to the Pacific Coast and the situation of some of the far western transportation companies. In answer to a question by C. R. Ellicott, Mr. Storrs said that the new policy with respect to the publication of *Aera* seems to be working out satisfactorily and that the association's magazine in its new form is meeting the approval of the industry. President Stevens called attention to the diversity of articles in the April issue and to the manner in which *Aera* is interpreting the activities of the association and giving emphasis to the human element in transportation operation.

D. W. Snyder, Jr., read a letter addressed by the Illinois utilities associations to the National Electric Light Association calling attention to the misleading information that is being circulated regarding the operation of the Springfield, Ill., municipal lighting plant.

Report of the committee on co-operation with manufacturers was made by Chairman E. F. Wickwire, and President Stevens for the Charles A. Coffin committee reported that there are indications that approximately ten entries will be made in this year's Coffin contest.

More Space for Exhibits This Year at Cleveland

A letter from Chairman J. H. Alexander of the exhibit committee was read by Mr. Welsh. The exhibit layout this year provides for a total of 135,000 sq.ft. of space, which is considerably more than that available last year. By agreement between the program, exhibit and entertainment committees, the day set aside for annual inspection of exhibits will be Tuesday of convention week instead of Wednesday as heretofore. It is also planned to open the exhibits at 9 a.m. on Saturday, Sept. 22, and a recommendation was made to the transportation committee that special trains be arranged to arrive in time so that delegates may take advantage of this earlier opening of exhibits. Mr. Welsh announced that bulletins and reservation blanks regarding hotel reservations will go out in a few weeks.

A tentative outline of the entertainment program was presented by President Stevens, who reported that the entertainment commmittee considers dancing one of the most popular forms of entertainment and is planning to provide more time on the entertainment program than has been available for this feature in recent years.

President Stevens called attention to the coming meeting of the United States Chamber of Commerce and suggested the value of attendance by electric railway men. Requests have been received by the association from the Baltimore Chamber of Commerce and from the Birmingham Chamber of Commerce asking support for E. B. Jeffery, candidate from the Second District and Oscar Wells, candidate from the Fourth District, respectively.

The next meeting was scheduled for Wednesday, May 9, at 3 p.m. in Washington, D. C., during the meeting of the United States Chamber of Commerce.

New Association Members

FIVE companies, four state and sectional associations and ten individuals were elected to membership in the American Electric Railway Association at the meeting of the executive committee held on March 30. A list of

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the companies and associations elected to membership follows.

RAILWAY

St. Paul City Railway, Minneapolis, Minn. This membership substituted for the Twin City Rapid Transit Company.

Wilkes-Barre & Hazleton Railway, Hazleton, Pa. This membership substituted for the Wilkes-Barre & Hazleton Railroad.

Boston, Revere Beach & Lynn Railroad, Boston, Mass.

MANUFACTURER

Anderson Brake Adjuster Company, Omaha, Neb.

The Collier Construction Company, Cleveland, Ohio.

STATE AND SECTIONAL ASSOCIATIONS

Central Electric Railway Association, Indianapolis, Ind.

Maryland Utilities Association, Baltimore, Md.

Midwest Electric Railway Association, Kansas City, Mo.

Pennsylvania Street Railway Association, Harrisburg, Pa.

Engineering Proceedings Ready

Proceedings of the Engineering Association covering the committee work and convention for the year 1927 are now being distributed to members. At last year's convention committee reports were presented at simultaneous divisional meetings, thereby making available more time for the general sessions. As a result a number of interesting papers on timely engineering topics were presented. These papers and the ensuing discussions are published in full in the Proceedings.

The papers included cover such subjects as track construction and maintenance, economies with modern cars, automatic substations, overhead maintenance, trends in motor coach engineering, and commercial aviation.

The work of the four general divisions of the Association covers many subjects of importance to the industry, together with a discussion of these matters on the convention floor. For the way engineer, such subjects as alloy steels other than manganese for special track work, rail corrugation, arc welding processes, wood preservation, and welded rail joints, will be found especially interesting. Rolling stock men will find in the reports of the Rolling Stock Division reports on motor coach design, car design, car lighting, noise reduction and other equally important subjects. The Power Division reports contain valuable information on automatic sub-stations, mercury arc rectifiers, trolley construction, and other matters of interest to power engineers.

The standardization work of the various divisions is another important phase of the Engineering Association work. Revisions of existing standards and practices, as well as new ones established, will be found throughout the committee reports.

Preferred Numbers Proposed

Preferred numbers have been proposed by the American Engineering Standards Committee. These have been informally approved by that body and are recommended to American industry for trial and criticism. According to a statement from P. G. Agnew, secretary of the A.E.S.C., preferred numbers have as their purpose the elimination of economic loss involved in the haphazard and often needlessly numerous gradations of size that characterize most of our common commodities.

The fundamental elements of the system lie in the proposal to arrange standard size series so that each succeeding model in a series shall be larger than the preceding size, not by a definite amount, but by a fixed per cent. By decreasing the number of sizes within a certain range while retaining a sufficient number of sizes in all parts of the range a system of preferred numbers makes it possible to effect savings in materials, labor, storage space, gages, containers, catalogs, sales cost, etc. An example of increase by a fixed per cent rather than by a definite amount is found in the Brown & Sharpe wire gage which has been in successful and wide use since 1857.

C. E. Skinner is chairman of the general committee on preferred numbers and H. H. Norris is the representative of the American Electric Railway Association, while L. P. Alford is chairman of the working committee.

Three series have been approved informally, being geometric series that give respectively five, ten, twenty and 40 gradations in passing from one to ten, ten to 100, etc. The attached table gives the four series for the range from one to ten. For the range from 0.1 to 1.0 the numbers are approximately one-tenth as large. The committee states:

So far as possible, the numbers of the five series are to be used in preference to those of the ten series, these again in preference to those of the twenty series and these, finally, to those of the forty series. It is permissible to pass over from one series of preferred numbers to an adjacent series.

TABLE OF PREFERRED NUMBERS

Informally approved by the American Engineering Standards Committee

5 Series	10 Series	20 Series	40 Series
(1 to 10)			
1	1	1	1
			1.05
		1.12	1.12
			1.18
	1.25	1.25	1.25
			1.32
		1.4	1.4
1.6	1.6	1.6	1.5
			1.6
		1.8	1.7
			1.8
	2.0	2.0	1.9
			2.0
		2.25	2.1
			2.25
2.5	2.5	2.5	2.35
			2.5
		2.8	2.65
			2.8
	3.2	3.2	3.0
			3.2
		3.6	3.4
			3.6
4.0	4.0	4.0	3.8
			4.0
		4.5	4.25
			4.5
	5.0	5.0	4.75
			5.0
		5.6	5.3
			5.6
6.4	6.4	6.4	6.0
			6.4
		7.2	6.8
			7.2
	8.0	8.0	7.6
			8.0
		9.0	8.5
			9.0
10.0	10.0	10.0	9.5
			10.0

COMING MEETINGS OF *Electric Railway and Allied Associations*

April 25-27—American Society of Civil Engineers, spring meeting, Washington Hotel, Washington, D. C.

April 25-27 — American Welding Society, annual meeting, 33 West 39th Street, New York, N. Y.

April 26-28—Missouri Association of Public Utilities, Jefferson City, Mo.

May 2-5 — Southwestern Public Service Association, Dallas, Texas.

May 4 — Metropolitan Section, A.E.R.A., 33 W. 39th Street, New York, N. Y.

May 6-12—Union Internationale de Tramways, de Chemins de Fer d'Interet Local et de Transports Publics Automobiles, Rome, Italy.

May 8-11—United States Chamber of Commerce, Washington, D. C.

May 9—A.E.R.A. Executive Committee, Washington, D. C., 3 p.m.

May 9-10—Central Electric Railway Master Mechanics' Association, Erie, Pa.

June 4-6—Midwest Electric Railway Association, Hotel Baltimore, Kansas City, Mo.

June 6-8—Canadian Electric Railway Association, annual convention and exhibits, Toronto, Canada.

June 20-27 — American Railway Association, Div. 5—Mechanical (including former activities of the Master Car Builders' Association and the American Railway Master Mechanics' Association), annual convention and exhibit, Atlantic City, N. J.

June 21-22 — American Railway Association, Motor Transport Division, Atlantic City, N. J.

June 28-29—Central Electric Railway Association, Cedar Point, Ohio.

July 8-12—Public Utilities Advertising Association and International Advertising Exposition, Detroit, Mich.

July 25-27—Electric Railway Association of Equipment Men, Southern Properties, Cincinnati, Ohio.

July 27-28—Central Electric Railway Accountants' Association, Detroit, Mich.

Aug. 16-17 — Wisconsin Utilities Ass'n, Transportation Section, Sheboygan, Wis.

SEPT. 22-28, 1928

American Electric Railway Association, 47th annual convention and exhibit, Cleveland, Ohio.

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News of the Industry

New Wage Contract Sought By New York State Men

Employees of the New York State Railways in Rochester, Utica and Syracuse have filed a petition with President James F. Hamilton of the company, asking a new wage and labor contract and providing for a straight increase of 8 cents an hour and certain changes in working conditions. The increase would raise crew conductors and motormen from 55 cents to 63 cents; one-man car operators from 60 to 68 cents an hour; interurban operators from 57 to 65 cents an hour.

The union bases its demands for more pay on fare increases granted the company in the three cities. The railways will oppose this plea on the ground of ever-increasing maintenance costs, especially in paving.

Any settlement agreed upon in conferences between railway and union officials must be ratified by joint vote of the workers in the three cities.

President Hamilton is non-committal as to the company's stand on the wage demand, but said he would hear arguments of the union officials April 15 or thereafter. The new contract is effective May 1 and, in case an agreement is not reached by that time, any subsequent pact becomes retroactive.

Wage Negotiations in Prospect for Eastern Massachusetts

Employees of the Eastern Massachusetts Street Railway, Boston, Mass., are preparing negotiations for a wage increase when the present agreement is terminated on May 2.

Under the present agreement the wage scale is 69½ cents per hour. Operators are said to be seeking 82 cents per hour and one new uniform a year. The demands are in line with present concessions and remuneration granted employees of the Boston Elevated Railway. The various unions in cities served by the Eastern Massachusetts Street Railway have voted favorably for a wage increase.

Sunday Passes in Gary

A special Sunday pass, costing 25 cents and entitling the bearer to travel during the entire day anywhere on the interurban or city system, will be adopted April 15 by the Gary Railways, Gary, Ind. The Sunday passes will be good for any number of rides but only on the Sunday on which they are purchased. Passes may be purchased either from car operators or at regular ticket agencies.

The longest interurban line operated by the company runs from Gary to Valparaiso, a distance of 26 miles. Other intercity lines connect Gary with Hobart, Hammond and East Chicago.

Locust Street Tube in Philadelphia Approved

An ordinance providing for construction and operation of the Locust Street surface-car subway was approved March 30 by the transportation and public utilities committee of the City Council of Philadelphia, Pa., and reported to the Council with a favorable recommendation. Where the new line will be connected with the Delaware River Bridge was not decided. The sum of $10,000,000 has been appropriated for the abandoned Chestnut Street tube project which the Mayor and the Council will transfer to the Locust Street work upon approval of the voters at a referendum in the forthcoming primary. The entire project will cost about $40,000,000 and construction will take three years. Under the ordinance the Philadelphia Rapid Transit Company will pay the fixed charges on the money borrowed by the city for the subway construction. After the cost of the project is met out of the rentals, the title to the line will be vested in the city.

Mayor Mackey has stated that he will call a conference on the Broad Street subway operating agreement soon after the primary of April 24. He stated that a conference on this point might have been called three months ago, but he preferred first to obtain engineering and operating facts for use in the negotiations. It was also announced by the Mayor that he had asked Comptroller Hadley to study the McChord finding and to report on the question of condemning the properties of the Philadelphia Rapid Transit underliers.

Council Adopts Belt Ordinance for Oklahoma City

The construction of an electric freight belt line at Oklahoma City, Okla., to cost approximately $1,250,000, was assured March 27, when the City Council adopted ordinances clearing the way for this project. This line is to be constructed by the Oklahoma Railway to connect its Oklahoma City-El Reno line with the line connecting Norman, Oklahoma City and Guthrie, and intermediate points. The route lies mostly outside the western city limits. The road will be used for hauling freight traffic. Material is being assembled and about 250 men will be employed on the project. This improvement was described in detail in the ELECTRIC RAILWAY JOURNAL issue of March 10, 1928.

Contract Ratified in Scranton

Employees of the Scranton Railway, Scranton, Pa., are now working under a new agreement with the company, following the recent vote to ratify the pact which replaces the one that expired April 1. Under the new agreement motormen and conductors were not granted an increase. However, carhouse men under certain classifications were given an increase of 2 cents an hour, and bus drivers 3 cents an hour. Trainmen will profit by a change in working conditions as regards "tripper" or rush-hour lines. Under the new contract trippers will not leave the carhouse before 1:30 p.m. and will not work later than 7:30 p.m. Four hours pay will be the minimum rate for this kind of work.

The new agreement also provides for the issuance of 75 passes per month to motormen, conductors, and bus drivers, which will be good on all rail and bus lines of the company. Workers also approved their subscription of 50 cents monthly to be assigned to the pension fund.

A general increase of 5 cents an hour for all employees had been sought by the men.

Report on Knoxville Awaited

Until the report of Harland Bartholomew & Associates, planning engineers on the transit facilities of the city of Knoxville, Tenn., is received and passed upon by the city planning commission an ordinance conferring franchise rights on the Knoxville Rapid Transit Company to give service on six separate bus routes is being held in the Council's files. The ordinance is subject to passage on final reading, after amendment to conform with the recommendations of the engineers, the planning commission and the act of the Council, when it is determined that the Knoxville Power & Light Company will not give the service sought.

Under its contract with the city to conduct the survey the firm of St. Louis engineers was to submit its findings not later than April 1, the local commission to receive same and pass the survey along to the Council with recommendations. Briefly the report, which will probably now be ready by May 1, is expected to develop the needs of Knoxville in the way of transportation facilities with recommendations for meeting such needs.

The engineering firm is committed, to an extent, to a policy whereby the company now furnishing transportation service shall have the right to meet the additional transit ordered by the Council, and where such an agreement is not harmoniously reached any independent company or companies be granted franchises for furnishing this service.

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Maryland Commission Denies Fare Decision Was Confiscatory

The Maryland Public Service Commission has answered the bill of complaint which has been filed by the United Railways & Electric Company, Baltimore, Md., and under which the company seeks to restrain the commission from preventing it from charging a straight 10-cent fare and charging two fares to the Halethorpe section. The commission recently handed down a decision permitting the United to charge 9 cents straight fare with three tokens for 25 cents. Hearings of the suit of the United Railways will open in the Circuit Court of Baltimore on April 30.

The commission declares that the maximum rate of fare the company is permitted to charge was adequate to provide for the necessary expenses and yield a fair return on the value of its property; that the percentage that was found would be the rate of return upon the fair value of the company's property, yielded by fares established by the order of the commission, was a sufficient rate of return to compensate the company for the use of its property in the public service; that the amount that was determined would be a proper annual allowance out of the earnings to provide for depreciation of the company's property was adequate for that purpose, and that the commission lawfully and properly required the company to abolish the second fare upon the Halethorpe line. When the commission handed down its decision it placed the Halethorpe territory on the one-fare zone.

The commission wants the court to dismiss the bill filed by the railway.

Articulation of Reading Lines with P. R. T. Suggested

The Philadelphia Rapid Transit Company, Philadelphia, Pa., proposed on March 30 that the Reading Company sell the two steam lines now in operation to Chestnut Hill, Newtown and Bustleton to the city of Philadelphia so they could be electrified immediately and made to serve as essential feeders to the $100,000,000 Broad Street subway. Officials of the transit company pointed out that the Reading Company would be able to abandon operations of the Chestnut Hill division and that the city could effect a saving in time and money through the immediate creation of a feeder line which would be considerably more costly to construct.

The Philadelphia Rapid Transit Company's proposal was coupled with an offer to join with the Reading Company in 50-50 operation of buses in territories which both companies plan to serve. The new subsidiary under the P.R.T. plan would hold the certificate of operation between Philadelphia and Easton, Philadelphia and Trenton and on a new line to operate along Old York Road making possible the abandonment of trains by the Reading Company on the New Hope branch.

Through Agnew T. Dice, the Reading Company's attitude toward the Philadelphia Rapid Transit's proposal was defined. He said that the suggestion that the city condemn railroads engaged in interstate commerce raised a grave question of law; that while the company did not object to conferences in the matter with anyone interested, it must be remembered that the plans of the Reading Company for electrification of all of its suburban lines, including those in question, was now nearing completion.

Final Briefs Filed in Interborough Fare Case

Briefs were filed on April 4 by the Interborough Rapid Transit Company, New York, in the case before the statutory court which is considering an application by the company for an interlocutory injunction preventing all parties concerned from interfering with the collection of a 7-cent fare. With the case closed and all the briefs, affidavits and exhibits, numbering thousands of pages, before the judges, a decision is expected within a week or ten days.

Schedules Revised in Toledo

Schedules on the Cherry Street line of the Community Traction Company, Toledo, have been revamped so that much better railway service may be provided to compete with other means of transportation. The new schedules provide for an average speed of 11 m.p.h., which will cut nearly fifteen minutes time off the round trip formerly in effect. Rush-hour service has also been speeded up, and at the peak there will be a 3½ minute headway.

Another new feature of the service on the line is the proposal to establish bus service on the owl runs.

New stops have been marked with a brilliant orange stripe around near-by poles at the curb, adding to the visibility and conforming to the color of the cars on the line.

System in Houston Offered to City

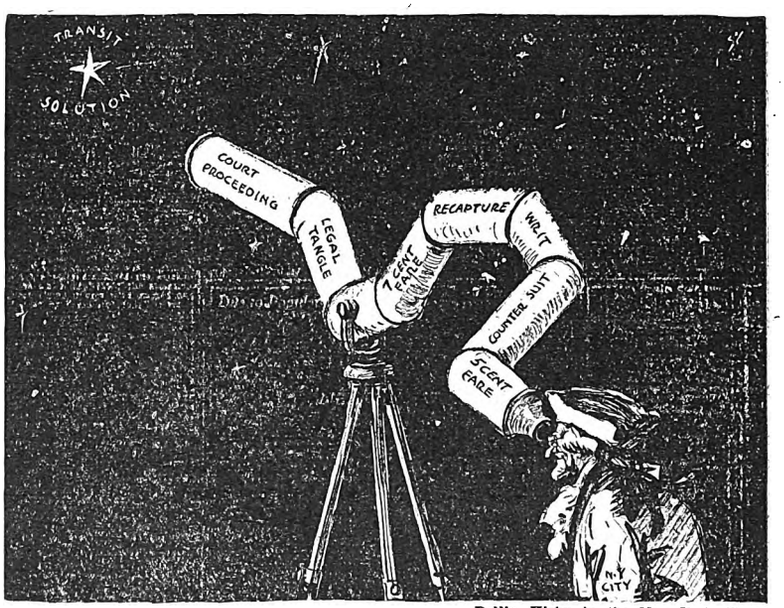
A proposition to sell the railway system of the Houston Electric Company to the city was made by Jeff Alexander, manager of the company, at a hearing before the City Council to consider the removal of the car tracks from one of the principal streets and the substitution of bus service. He is reported to have said:

I should like to ask you to consider seriously the possibility of the city taking over the railway and running it as a city-owned project. It is impossible for any private corporation to continue giving something that costs more to operate than is received for the service.

We've been losing money since 1920. Then our properties were valued at $6,000,000. Now the valuation has jumped to about $9,500,000. Our earnings haven't increased in proportion to our capital investment and we can't go to the stockholders each year and ask them to put more money in the railway on the strength of promises. Out-of-town investors just won't continue to invest their money here in a losing proposition.

The city must buy the company or subsidize it, or the matter will end in the courts, he declared. Mr. Alexander is also reported to have said:

The taxpayers are going to have to pay for the railway service in the end, so why not let the city supervise that expenditure. Let the city buy the system. People are not getting the service they are entitled to, and we can't give it to them. We'll be glad to have the properties appraised by any fair board of appraisers you appoint and take their offer.



Rollin Kirby in the New York *World*

Star gazing

Pointers from Cleveland

Personal Pointers, containing information pertaining to employee activities, is to be distributed from time to time by the Cleveland Railway, Cleveland, Ohio. These sheets will also tell about the workers of the safety, welfare and employment divisions of the company.

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Status of Massachusetts Bills

All the propositions pending before the Massachusetts Legislature concerning the future of the Boston Elevated Railway are now before the House committee on ways and means. The bill which has the backing of a committee report is house bill 1129, which calls for public ownership, and on which the fight is centering at the present stage.

This bill could create a metropolitan transit commission and invest it with authority to purchase the Boston Elevated under the option contained in the 1918 control act and to operate the system in Boston, Cambridge, Somerville, Medford, Malden, Everett, Revere, Chelsea, Newton, Arlington, Brookline, Watertown and Belmont. Advocates of this measure contend that there is no other bill that has any reasonable expectation of passing the Legislature, and opponents of it are backed by the Boston Chamber of Commerce and by a strong minority committee report in the Legislature.

It may be significant that the House committee on ways and means has authority to consider all the Elevated bills, and can report any one of them as it is or in amended form, or can report a resolve for further study of the situation.

Express Service for Hartford Baseball Fans

The Connecticut Company, Hartford, Conn., is to cater to the baseball fans of the city during the coming summer. In a recent conference between N. J. Scott, manager of the Connecticut Company at Hartford and J. W. Pyne, business manager of the Hartford Baseball Club, it was arranged that the company would operate express trolleys to the ball park. Complete details have not been announced but preliminary plans provide for express cars to run in advance of regular cars, thus cutting the running time a half hour.

Employees of insurance and brokers' offices quit work early enough in the afternoon to witness the Eastern League games played at the Buckeley Stadium, but in the past it has been difficult for them to reach the stadium by trolley in advance of game time due to the many stops.

Sleet Storm in Ohio Damages Utilities

Damage to the extent of more than $750,000 to various utilities is reported as the result of the sleet storm which swept over northwestern Ohio on March 29. The city of Findlay was without wire communication and electricity for more than a week. The Toledo, Bowling Green & Southern Traction Company was able to restore partial service April 1, but it was said that it would be several days before Findlay is completely lighted again. Many poles were thrown across the tracks of the interurban between Toledo and Findlay, and while service was badly crippled it was stated on April 4 that the road was rapidly emerging. The loss to this company is placed at $100,000.

The Taxi and Railway in Seattle

Declaring that the present taxicab rates are making deep inroads into the earnings of the Seattle Municipal Railway, Seattle, Wash., Robert MacFarlane, representing a group of unnamed business men, recently filed a request with the City Council for an exclusive franchise for a taxicab-operating $1,000,000 organization, to be formed by a merger of existing taxicab concerns. Mr. MacFarlane said the group he represented was prepared to post $25,000 bond if the Council would consider its offer. His plan provides that the taxicab concerns given the franchise would pay the city 2 per cent of its gross earnings, with a minimum of $25,000 a year. Details of regulation, rate-making and parking would be left to the City Council under the proposed plan. In effect the plan calls for a monopoly for the organization operating the taxicabs. The plan stipulates that if a franchise be given another taxicab company the 2 per cent earnings tax would be forfeited. Mr. MacFarlane said:

> Lack of proper regulation and supervision has made a "jitney" out of practically every taxicab today in certain classes of service, it is actually cheaper to ride in a taxicab than on a street car. An actual survey discloses that present taxicab rates are resulting in an increase of approximately $600,000 a year. This means a correspondingly less volume done by the street cars.

The proposed merger has not met with unanimous approval of the taxicab operators. Organized labor is also expected to take an active hand in the question, since the rate war has directly affected wages of drivers, members of the taxi union declare. Present union agreements with operating companies expire May 1, and new agreements are now in the making. It is stated drivers will insist on a straight zone-rate wage being paid on cabs operating on a zone-rate or part zone-rate basis. City officials have voiced their approval of any "reasonable plan" that would end competition.

The *Seattle Daily Times* says the figures show a steady decrease in railway revenues during the last few years, but fail to show that the recent low-rate taxicab competition has had any marked effect on railway revenues. The *Times* statistician states that during October, November and December, 1927, and January, 1928, a period when the taxicab rate war had gathered full momentum, the total in railway fares collected came to $1,910,332. He also shows that during similar months of the preceding year the receipts were $1,955,749, so that there was a decrease of $45,526. This decrease appears to be a part of a steady decline in railway riding. During the last few years the decrease has been marked.

Reconstruction Order in Omaha Termed Unfair

The Nebraska Supreme Court has sustained the appeal of the Omaha & Southern Interurban Railway, Omaha, Neb., from an order of the State Railway Commission that it reconstruct a highway bridge over its lines at a point in Sarpy County, and ordered the case dismissed without prejudice to another order should conditions warrant one in the future. According to the court the commission is without jurisdiction or power to order a crossing of this kind at the expense of a common carrier to meet a contingency that may never happen, and it may make such an order only when it is clear that the public convenience or necessity requires such construction. This overhead crossing formerly carried a road used before automobiles came into use, but was abandoned by drivers because of its grade. When the bridge collapsed the county board brought suit to require its reconstruction.

The court says that the intent of the Legislature was that safe and adequate means for crossing railroad tracks be provided where they were needed; further, that it would be assumed that the legislators knew that as the cost of such construction eventually was paid by the public, it would not require that to be done at public expense which was not for its convenience and use.

Yesterday, Today and Tomorrow Via the Trolley

The trolley may be troubled, as indicated by Raymond S. Tompkins in the April issue of *American Mercury*, but the conclusion of the author, after a careful study, is that the future of the electric railway industry looks reasonably bright, at any rate to those who take the view that in the big cities nothing else but street cars will do the transportation work efficiently. In the face of many discouraging features Mr. Tompkins, affiliated with the United Railways & Electric Company, Baltimore, and a former newspaper man, sees optimism all along the line in the possibility of restoration of the electric railway as a transportation service to full vigor and efficiency. He traces briefly the history of the electric railway from the day of the horse car to the glamorous installation of electric cars in Baltimore, Cleveland and Richmond. One of the big movements in this industry stressed by the writer is the change in attitude on the part of the railway managements toward the public they serve. With them today public relations is a telling factor in the selling of rides.

Extension Again in Chicago

The franchises of the Chicago Surface Lines have been extended by the City Council for another 30-day period. This is the fourteenth time that the franchise, which expired Jan. 31, 1927, have been extended.

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Transportation Progress Noted at Connecticut Exhibit

The Connecticut Company featured the Home Progress Exposition, held at Hartford, Conn., March 24-31, with the exhibition of one of the latest model street cars. This booth attracted much attention and elicited considerable praise. So attendants at the booth might explain the mechanism the body was cut away exposing the motors and brakes. The car formed only part of the company's exhibit.

L. S. Storrs, formerly president of the Connecticut Company, and now managing director of the American Electric Railway Association, presented to Yale University a quaint model car, which the university was kind enough to loan to the company in connection with the exhibit. The model is a replica of the pioneer electric car operated in Derby, Conn., in 1888. This car marked, it is said, the advent of the overhead trolley in Connecticut. The car was 18 ft. long.

At the booth were interesting photographs from days gone by depicting cars, long out of commission, and gangs of bearded working men. There was a picture of the State Street carhouses, Hartford, taken in 1885. There was also a picture of the original trolley car operated in Meriden in July, 1888, and the first car to make its appearance in Hartford on Sept. 12, 1888, on the Wethersfield Avenue line. The photograph of a Hartford horsecar taken 50 years ago came in for much attention and comment.

Columbus Council Postpones Franchise Negotiations

Action on the new franchise for the Columbus Railway, Power & Light Company, Columbus, Ohio, has been postponed by the City Council until May 15.

The chairman of Council's utilities committee presented the company's suggestions to Council after conference with C. G. Slater, president and general manager of the railway. Mr. Slater said that extensions sought would be granted and better service would be provided on all lines if the company were permitted to speed up its cars. He wants the legal limit raised to 25 m.p.h., the "skip stop" system established and all streets with car tracks designated as main thoroughfares as a means for speeding up service.

Unless the concessions are made it will be impossible for the company to grant the extensions requested by Council. Mr. Slater said the company had been losing money because of the taxicab rate war and price cutting competition.

The Columbus Railway, Power & Light Company has been operating in the city without a franchise since Feb. 4, 1926. A 25-year franchise was rejected by the company in October, 1926, after the City Council had amended an ordinance to compel the company to extend Broad Street service from Hague Avenue to the west corporate limit. The company contended this could not be accomplished because of the difference in gage of track. This together with objections to other minor stipulations was given by the company as its reasons for rejecting the franchise.

Municipal Ownership Defeated in Madison

At the election on April 3 the people of Madison, Wis., by a vote of about 8,000 to 5,000 defeated the referendum question providing for the acquisition of the Madison Railways by the city. Official figures are not as yet available. Madison also defeated municipal ownership of the railway eight years ago.

Both newspapers in the community, one a conservative and the other a La Follette organ and avowed municipal ownership newspaper, favored acquisition of the property. In fact, the conservative paper staged meetings in favor of municipal ownership, at one of which Carl D. Thompson, secretary of the Public Ownership League of America, appeared.

Swope District Pushing Through Service in Kansas City

Members of the Swope Land Improvement Association and residents of the Swope district of Kansas City, Mo., are agitating for the extension of railway and bus service to the downtown district. A number of civic meetings has been held and petitions circulated, and some support for the project has been promised in the City Council. More than 500 names have already been obtained on petitions requesting rerouting, and 1,000 are expected by the time the mass meeting is held.

F. G. Buffe, vice-president in charge of operations, said the Kansas City Public Service Company could not seriously consider the request for through cars until September, due to the unusual number of cars taken from service during rehabilitation. The small cars now used on the Swope line are not suitable for downtown use, and the company would not have enough other cars to use until the program of rehabilitation has been completed this fall.

Foreign News

English Tramway to Use Buses

At the annual meeting of the Yorkshire Electric Tramways, West Riding, England, it was decided that no dividend would be paid on the ordinary shares in order to preserve all available money to buy buses for use on the tramway lines which have been abandoned. It was said that owing to bus competition the element of good will has disappeared, reserves have been expended and further abandonments would doubtless follow.

Charge for the Return of Lost Articles in Glasgow

Small fees are now charged by the Glasgow Tramways to owners of property which has been lost on the cars when they go to the lost property room to reclaim it. Last year more than 20,000 articles found on the cars were returned to their owners.

New Tramway Line for Tallinn, Esthonia

Construction of a tramway line is now under consideration by the city street car administration of Tallinn, Esthonia, a republic on the Baltic Sea. The proposed line would connect the Vabaduse Platz in the center of the city with Kipli, the peninsular district of the suburbs, a distance of 6 miles. The cost is estimated at $367,000.

When the new line is completed it is planned to lay a double line in the Suur Tartu Maantee. Construction of a street car connection between Tallinn and Pirita, a popular seaside bathing beach and summer resort some 5 miles distant, is also contemplated.

Austria Criticised for Abandoning Railway Electrification

Great disappointment and surprise are felt throughout Austria at the decision of the authorities to proceed no further with the electrification program of the Austrian State Railways and to utilize for other ends the remainder of the funds set aside for this purpose out of the international loan.

It is claimed that portions of the electrified lines now in operation are working at a financial disadvantage. Owing to the consideration of the possibility of imported coal becoming cheaper and too favorable estimates of the cost of electrification, the initial calculations are said to be inaccurate.

This decision is being very sharply criticized by those who had praised the soundness of the government's former argument that the development of the country's water power would keep within Austria vast sums of money now spent on coal from abroad.

German Railway Bonds Offered

The Vestern Electric Railways Corporation, which operates interurban electric railway and automobile bus lines in Westphalia, Germany, offered on March 1 $1,750,000 first mortgage twenty-year sinking fund 7 per cent bonds in the American market at 98 and interest, to yield about 7.20 per cent. Earnings are guaranteed by the municipalities which own these lines.

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Recent Bus Developments

$5,392 for Louisville Franchise

The Louisville Railway now owns the blanket franchise to operate buses on the streets of Louisville, Ky., for twenty years. At a perfunctory auction, at which no other bidders appeared, Thomas B. Crutcher, member of the Board of Public Works, awarded the franchise. The upset price named in the ordinance, under which the franchise was sold, was $5,000 and the $392 represents half of the advertising cost. James P. Barnes, president, bid in the franchise for the railway and deposited a certified check for the amount. The sale now goes to the General Council for ratification. Service on the announced bus lines will be started at once.

John Chandler, attorney for a group of jitney bus operators, asserted in a statement afterward that the sale for a mere nominal price to the Louisville Railway justified the allegation of the petition of the independent bus operators that the ordinance was passed exclusively for the Louisville Railway, in order to give it a monopoly of the city streets. The case may go to a Court of Appeals.

Protest from Washington Property

Officials of the Washington Railway & Electric Company will protest to Maryland authorities over an attempt of a bus line operating between Gaithersburg, Md., and Washington, to secure an intrastate rating. Over a large part of its course the bus line parallels an interurban line of the Washington Railway & Electric Company. Although under the present laws there can be no regulation of the interstate business of this bus route between Maryland and the District of Columbia, the electric railway will ask the state authorities to deny the bus line permission to compete with its line between Maryland points.

Protection for Railway in Ohio

The Ohio Supreme Court has upheld the Stark Electric Railroad in its fight against competition of the Sebring-Alliance Bus Company. Carrying a state certificate to the Supreme Court on the ground that it was illegal, the Stark Electric won a ruling which prevents the Sebring-Alliance Bus Company from making Sebring and Alliance, 4 miles apart, terminals.

Passengers boarding buses in either city must alight at the corporation line of the other, the Supreme Court ruled in referring the bus certificate back to the Ohio Public Utilities Commission for a revision. This ruling was made in face of petitions from bus riders, and also in face of testimony which shows that the two transportation companies enter Alliance at points more than half a mile apart.

The fight was led by E. W. Sweezy, general manager of the Stark Electric Railroad, who for months has authorized court battles preventing increased competition between the railway and bus companies.

P.R.T. Seeks Approval of Bus Purchase

The Philadelphia Rapid Transit Company, operated by Mitten Management, Inc., has bought the Quaker City Cab Company and three small suburban bus concerns for $1,825,000, $2,325,000 less than their combined assets. This was announced by Ralph T. Senter, president of the transit company, before the Public Service Commission on April 4 in support of an application for approval of the transaction.

In an effort to prove that the rival companies were bought at "bargain prices," Mr. Senter introduced a consolidated balance sheet showing their assets as $4,150,000. Separate statements revealed that all except $650,000 of the assets belonged to the cab company. Its excess of assets over liabilities was given as $3,500,000.

The Mitten organization operates the Yellow Cab Company, local trolley, subway-elevated and bus lines in the city of Philadelphia and several interurban bus lines running out of that city.

Contention Over Operations in Milford

A bus war is being waged in Central Massachusetts with Milford the strategic point. The cause is bound up with the filing of petitions of the Johnson Bus Lines Company, Inc., and the Medway & Dedham Bus Lines for permission to operate. Officials of the company have informed the selectmen of Milford they do not intend to operate buses over the proposed routes as long as railway service is maintained, but that they understand some of the railway lines of the Milford & Uxbridge Street Railway, which now serves that territory, are to be discontinued. On the other hand, word has also reached the Milford Selectmen that a new trolley and bus line company is in process of formation as a result of the recent sale of the Milford & Uxbridge Street Railway to Citron-Byer Company, Clifton, N. J.

The bus company operating between Medway and Dedham was also opposed recently before the Massachusetts Public Utilities Department by Fred A. Cummings, representing the public trustees of the Eastern Massachusetts Street Railway. He contended that a certificate granted to the bus company for operation between Blackstone and the Boston-Dedham boundary line would have a disastrous effect on the railway lines in Walpole, Norwood, Westwood and Dedham.

Parker Bill Up on April 10

The Parker interstate bus bill will be considered at a hearing April 10, according to an announcement from the Interstate Commerce Committee of the House. The legislative sub-committee of the American Automobile Association's bus division, which sponsors the measure, will present witnesses at the hearing. It is understood that the electric railway bill introduced by Representative Johnson of Indiana will be given a hearing after the bus measure is disposed of, although the exact date for this has not been determined. Extended reference to the provisions contained in the Parker bill was made in the issue of the ELECTRIC RAILWAY JOURNAL for March 31, page 559.

Franchise Sought by New York & Queens County

The Queens-Nassau Transit Lines, Inc., is petitioning for a franchise to operate a bus route to be known as the Murray Hill route. In effect, it will be an extension of the system of electric railway routes now operated in the Borough of Queens by Lincoln C. Andrews as receiver of the New York & Queens County Railway. The rate of fare on the proposed Murray Hill route will be 5 cents. It is proposed that free transfers be issued upon payment of cash fare from the cars of the New York & Queens County Railway to the buses of the Murray Hill bus route. Nine advantages of this route are listed in the application. The Murray Hill section would be connected with Jamaica, College Point, the Main Street section of Flushing, Jackson Heights and Corona by the free transfer privilege.

The Queens-Nassau Transit Lines, Inc., is organized under the Transportation Law of the state of New York. All its stock is held by the receiver of the New York & Queens County Railway. The receiver has received the consent of the bondholders committee of the railway to operate the proposed bus route. The present organization of New York & Queens County Railway will be used to operate this route.

Don't Need Bus in Brighton

The City Council committee on jitney licenses has rejected the petition of the Boston Elevated Railway, Boston, Mass., asking for authority to operate a bus line in Market Street, Brighton, between Western Avenue and Washington Place. An opinion derived from a hearing on the matter showed the public in that section to be favorably inclined to the railway service now in existence there.

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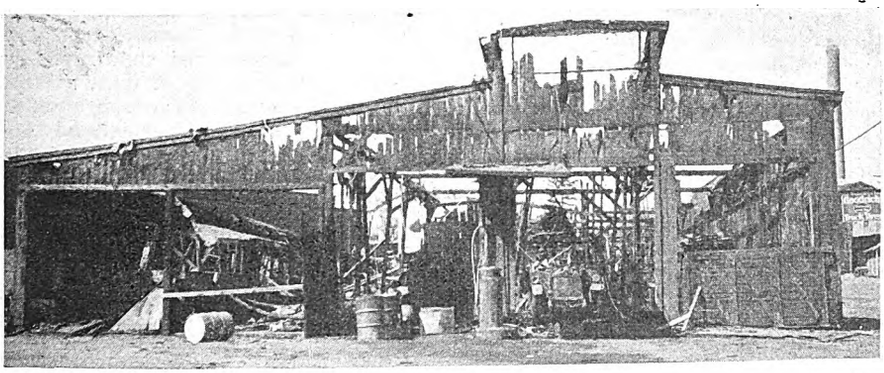
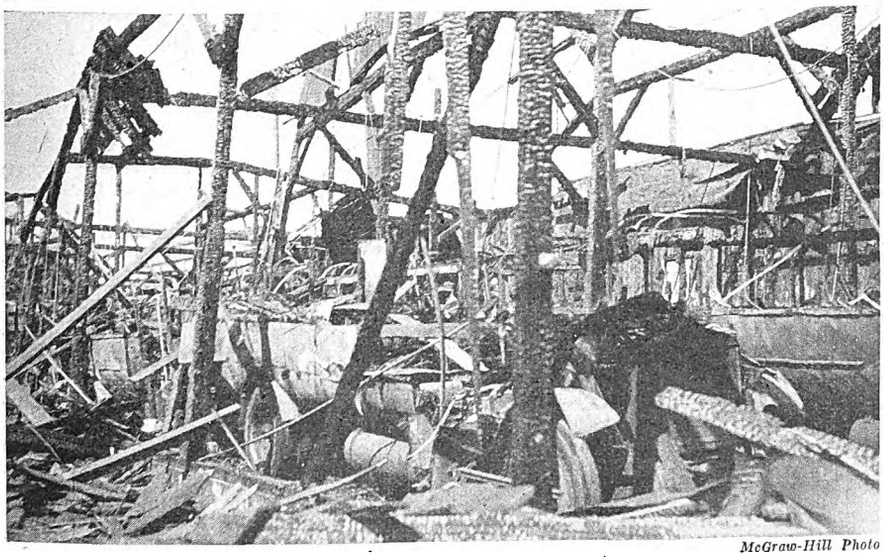
Twenty Buses Destroyed in Newburgh Fire

Fire destroyed the garage of the Newburgh Public Service Corporation, Newburgh, N. Y., on the morning of March 30. Of the 20 buses in service in the city only one was saved. In addition, three private automobiles and five trucks were burned. The loss may exceed $200,000, but the plant and equipment were fully covered by insurance.

The city was entirely without bus service Saturday morning, but arrangements were made at once to furnish a temporary service. Spare buses were secured from the Hudson Transit Corporation and the Cornwall and other lines, and arrangements were made to secure buses from out of town.





McGraw-Hill Photo

Fire did deadly work when it destroyed all but one of twenty-one buses

All the buses in the garage had been filled with gasoline immediately after the finish of the day's run and were arranged in the garage so they might be run out quickly when the morning work was resumed. The bus that escaped destruction by the fire was one used to take the employees to their homes after the system was shut down for the night. It was engaged in this task when the fire was discovered.

The garage was located on Wisner Terrace near the South Plank Road. The building was principally frame. It was built originally to house the street cars, but since the buses were installed to replace the local trolley lines, it had been used to store the buses when they were not in regular service. The building covered a plot 200 ft. by 60 ft. It was valued at $30,000.

Bus Scheme by Jamaica Company Not Sanctioned

The management of the Jamaica Public Service Company, Kingston, British West Indies, has been in communication with the government over the proposal to establish a bus service in the corporate area. The company intends to operate five or six buses of about 4½ tons but the scheme has been held up because it is in conflict with the motor car law, which prohibits motor vehicles of more than 2½ tons on the island.

Evansville & Ohio Petition To Be Heard

April 9 has been fixed by the Indiana Public Service Commission as the date of a public hearing on a petition of the Evansville & Ohio Valley Railway for the right to run passenger bus service from Evansville, Ind., to Henderson, Ky. The company has been operating an interurban railway from Evansville to Henderson since 1912, over leased tracks of an abandoned line of the Illinois Central to the Ohio River where the interurban cars were ferried across the river and then operated into Henderson, Ky. It is proposed to succeed this service very shortly by bus operation with the same hourly schedule rendered by the interurban. On March 16 the receiver of the company was authorized to make this substitution by the court.

The service is being installed because of the possibility of a bridge being constructed across the Ohio River between Evansville and Henderson in the next two years. Work will very likely start some time this year and after the bridge is in operation, service by interurban over the ferry would be slow and undesirable to the public. The company has therefore requested to use buses.

Reading and the Bus

Public Service Commissioner Benn has approved the plan of the Reading Company to spend $1,000,000 for buses and garage facilities at Pottsville and Doylestown during the first year of operation by the newly formed subsidiary, the Reading Transportation Company. The company is petitioning for transfer of 95 per cent of the stock of the subsidiary to the Reading Company. The testimony before Commissioner Benn dealt mainly with the program of bus operation intended for Schuylkill County. He overruled the objection of the Schuylkill Railways, Schuylkill County Railway and the Schuylkill Transportation Company that an interstate carrier such as the Reading Company could not acquire stock in an intrastate company.

When the hearing was concluded Commissioner Benn announced that the Reading application would be laid before the entire Public Service Commission with a recommendation for favorable approval.

Permanent Franchises Sought for Syracuse

Permanent franchises, to supplant the present temporary permits which expire this summer, are sought by the Syracuse Co-ordinated Bus Lines, Inc., which operates the bus lines of the New York State Railways in Syracuse.

Action by the municipal administration is expected soon, according to Benjamin E. Tilton, vice-president and general manager of the railways. Mr. Tilton will base his argument for the proposal on the fact that his company has put bus feeder lines and extensions into operation and has plans for many more similar lines.

The company will ask a fare for bus lines similar to that on the trolley lines. The bus fare now is 7 cents with transfer privileges. The trolley fare is 10 cents cash and 7½ cents for tickets.

Substitution on One Line in Oakland

The Key System Transit Company has been authorized by the California Railroad Commission to abandon service on its Rockridge line in the city of Oakland. It is planned to substitute bus service over the temporary route now in operation.

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Financial *and* Corporate

Legislative Status at Boston Stockholders' Meeting

At the annual meeting of stockholders of the Boston Elevated Railway, Boston, Mass., held April 2 all acts of the directors in 1927 were ratified by a vote of the stockholders. No other business was done at the meeting, but a number of questions was asked about the status of proposed legislation. The only definite information that could be given was that no matter what the Legislature did this year there could not be any material change in the operation of the property in much less than two years. Should public ownership be adopted it might not require a full two years to execute the taking of the property.

After the Legislature has acted the stockholders will be called into special session immediately, if their vote or opinion is required; they will have nothing to say about the conversion of the property to public ownership, however, because that can be done by the commonwealth without their approval, under the option clause in the public control act of 1918.

Traffic, Fare and Wage Figures

Electric railway passenger traffic continued to fall off at an increasing rate during the month of December. The number of revenue passengers, including bus passengers, reported by 193 companies to the American Electric Railway Association for December, 1927, compared with December, 1926, is as follows:

December, 1927	$19,663,893
December, 1926	844,205,989
Decrease, per cent	2.91

The average cash fare in cities of 25,000 population and over:

	Cents
Jan. 1, 1928	8.0177
Dec. 1, 1927	7.9993
Jan. 1, 1927	7.7790

Average maximum hourly rates paid motormen and conductors in two-man service by companies operating 100 or more miles of single track:

	Average Hourly Rate cents	Index Number 1913 = 100 Per Cent
Jan. 1, 1928	57.27	210.17
Dec. 1, 1927	57.27	210.17
Jan. 1, 1927	56.88	208.73

Dividend Passed in Harrisburg

For the first time since April, 1921, the Harrisburg Railways, Harrisburg, Pa., has been forced to pass the semi-annual 3 per cent dividend on its preferred stock. This makes a total of 29 per cent in unpaid dividends on the preferred stock accumulated in the last twelve years.

During 1927 the Harrisburg Railways transported 31,141,287 passengers as against 32,477,229 for the year previous. In 1923 the number of passengers hauled was 34,560,489. Despite the falling off in traffic last year the company's cars operated 12,700 more car-miles than in 1926. The company paid out in 1927 $131,259 for track renewals and this year's program is estimated at approximately $133,000, exclusive of what the railway will have to pay toward the cost of widening a subway in Harrisburg's business district.

Deal May Be Delayed

Modification of terms suggested for plan by which Insulls would enter other Indiana Railways

TERMS of security exchange in the Insull-Morgan plan and agreement for consolidation of the Terre Haute, Indianapolis & Eastern Traction Company properties with the power distributing properties of the Central Indiana Power Company have been so altered that many more months may elapse before the consolidation will be presented for approval of the Indiana Public Service Commission.

Committees acting for security holders of the Indianapolis & Martinsville Rapid Transit Company, the Indianapolis & Northwestern Traction Company and the Indianapolis, Crawfordsville & Danville Electric Railway have been notified by Halsey, Stuart & Company, readjustment managers, that guarantees of interest and sinking fund payments had been withdrawn in the plan for securities they were to receive in the new consolidation setup.

Question of Guarantees Provokes Discussion

New stock and bonds were to have been issued by the consolidation in the name of the Indiana Central Rapid Transit Company, formed by consolidation of the three interurban divisions. It was part of the first agreement that the new bonds and stock of this company be protected by annual sinking fund charges and interest payments guaranteed by the Indiana Electric Corporation, the operating company.

While the Central Indiana Power Company would like to add the electric distribution territories covered by the railway lines to its own far-flung Indiana system, the tone of the recent notice makes it appear that the Insull utility does not intend to assume responsibility for profitable operation of the railway lines. The power companies could expect profitably to devote some of their earnings to rehabilitation of the interurban lines, whose power distributing business they would like to have, but they do not appear to care to hazard the risk of operating the railway lines to the extent of making irrevocable guarantees.

Additional Securities to Be Authorized for Richmond

At the annual meeting of the Virginia Electric & Power Company, Richmond, Va., to be held on April 16, stockholders will be asked to vote on the question of authorizing the issuance of $8,000,000 of first and refunding mortgage gold bonds. This is part of a $20,000,000 issue, of which $12,000,000 is now outstanding.

Stockholders also will vote on amending the charter to provide for an increase of $5,000,000 in the authorized preferred stock of the company. The increased stock is to be 6 per cent cumulative preferred of the same class as the 6 per cent cumulative preferred now outstanding and is to be sold from time to time as the directors shall determine.

This action by the stockholders is desired in order that the company may have further securities of these classes available for prompt issue from time to time in the event it is deemed advisable to finance future requirements in this way.

Inclusion in New York Central System Sought

The Fonda, Johnstown & Gloversville Railroad, a short line connecting with the New York Central Railroad, has filed a brief with the Interstate Commerce Commission asking that the commission take action providing for its inclusion in the proposed system to be created by the lease by the New York Central of the lines of the Big Four and the Michigan Central railroads, for which application is now pending before the commission. The brief says:

> We submit that in order to preserve and maintain this intervener's line in a healthy condition to serve its territory as a part of any national system of transportation, it must be included in the applicants' system, and that since the applicants are seeking the benefit of a portion of the consolidation legislation enacted by the Congress for the purpose of establishing such national system of transportation, they are under the duty of either including it in their system or making in their plan reasonable provision for its inclusion therein.
>
> We, therefore, respectfully request that this commission shall take such action in the premises as it may deem necessary for the purpose of bringing about this result.

Results in Toledo Improve

Increased industrial activities and more favorable weather conditions have improved railway and bus operating results in Toledo. February operations of the Community Traction Company showed $298,909 total revenue as against $294,147 for the corresponding month last year. There was, however, a net deficit of $15,090 to the stabilizing fund after expenses, taxes, reserves and charges made under terms of the Milner ordinance. This brings the total deficit to $1,303,073.

The sinking fund requirements have

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now ceased and indications are a change in results will be shown favorable to wiping out the deficit over a period of years. The sinking fund requirements have been $25,000 or more each month.

Under the terms of the Milner ordinance in less than three years the voters will be called upon to extend the grant or begin a fifteen-year period of amortization of the property through fares collected. It is hoped to make a big cut in the deficit in this period or else reach some agreement on a new way out of the situation.

Merger Proposal in Washington Modified

The Public Utilities Commission of the District of Columbia has made public its changes in the merger agreement covering the Capital Traction Company, the railway lines of the Washington Railway & Electric Company and the Washington Rapid Transit Company. The changes now go to the companies for their approval.

The $50,000,000 rate base called for in the agreement, which has been one of the features most vigorously attacked, was approved for a temporary period of ten years, after which the commission prescribes a revaluation.

The commission, however, removed the 7 per cent return provision from the agreement, and in its place inserted a clause which declares that the merged company shall be "entitled to earn a fair and reasonable" return on the $50,000,000 valuation.

The commission also added another provision which stipulates that the present rate of fares shall continue in force for one year after the merger.

A letter outlining the modifications made in the agreement will be sent to the companies, with a recommendation that the changes asked be made, so that the document may be sent to Congress without further delay for ratification.

Among other changes which the commission recommended were:

That the commission be relieved of duty of nominating the three public representatives to serve on the board of directors of the merged company.

That the companies be relieved of paying certain costs for paving between their tracks.

That the companies continue to share the expense of repairing bridges over which their lines operate.

That nothing be included in the revised agreement which would limit the powers of the commission.

Morris County Receivers Directed to Pay Tax

Federal Judge William N. Runyon, of Newark, N. J., has signed an order directing the receivers of the Morris County Traction Company to pay taxes due to nineteen municipalities through which the defunct company operated railway lines. The total of taxes due is $102,769 to be paid out of $260,470 realized from the sale of assets.

More Passengers Carried in New Jersey

627,153,013 persons were transported by Public Service Corporation subsidiaries, of whom 266,079,948 were handled by bus. Net income of railway in red, but not income of buses $513,668

A CONDENSED summary of the results of operations of Public Service Corporation of New Jersey and subsidiary utility companies for the twelve months ending Dec. 31, 1927, follows:

Operating revenues, gross earnings		$115,005,908
Operating expenses	$49,035,808	
Maintenance	11,885,135	
Depreciation	10,084,133	
Taxes	11,930,113	82,935,191
Net income from operations		$32,070,717
Other income		906,178
Total		$32,976,895
Deductions (fixed charges, etc)		18,642,579
Balance for dividends and surplus		$14,334,315
Dividends on preferred stocks of Public Service Corporation of New Jersey:		
8 per cent cumulative preferred stock	$1,722,496	
7 per cent cumulative preferred stock	2,023,539	
6 per cent cumulative preferred stock	1,286,117	5,032,152
		$9,302,163
Dividends on common stock of Public Service Corporation of New Jersey		8,018,926
Net increase in surplus		$1,283,237

During the last months of the year a large new engineering and construction company was formed under the name of United Engineers & Constructors, Inc., combining therein: The U. G. I. Contracting Company, Public Service Production Company, Dwight P. Robinson & Company, Inc., and Day and Zimmerman Engineering & Construction Company.

The new enterprise will be the largest of its kind in the world. Public Service Corporation of New Jersey will, hereafter, instead of owning all the stock of Public Service Production Company, own 40 per cent of the capital stock of the new company. It is expected that the new company will execute annually a large volume of work in a manner that will result in the clients of the company receiving the best of service at the lowest cost.

There were 627,153,013 passengers carried on Public Service cars and buses during 1927, an increase of 29,822,141 over the number carried in 1926. This gain was due in part to the normal increase in traffic in the rapidly growing territory served and in part to the acquisition of bus lines from independent operators, the putting into service of new lines, extension of routes and the inauguration of lines giving a higher grade of service at a higher fare.

These various steps are in line with the announced policy of Public Service to create a co-ordinated system of car and bus transportation which will provide the kind and quality of service by street cars and buses needed to meet public requirements.

In the case of a number of street car lines of light traffic, it has been deemed advisable in the interest of economy and improved service to substitute bus service for the cars. In all such cases the results have been satisfactory.

There was established in January a charter car and bus department in charge of a general passenger agent. The result has been a substantial increase in the volume of charter bus and car business done. Special service has been operated to amusement parks, resorts, and to football games and like public gatherings. The possibilities of developing this service is indicated by the fact that on Sept. 11 as many as 109 buses were under charter.

On Oct. 28, a bus terminal for Williamstown buses, previously operat-

INCOME ACCOUNT FOR THE TWELVE MONTHS ENDED DEC. 31, 1927

	Public Service Railway	Public Service Transportation	Public Service Railroad	Other Affiliated Companies	Total
Operating revenues	$18,231,215	$14,893,121	$291,009	$1,954,260	$35,369,607
Operating expenses	$9,105,506	$8,674,650	$65,486	$744,896	$18,590,539
Maintenance	2,621,826	3,022,788	52,564	134,336	5,831,517
Taxes	2,052,298	820,943	48,498	166,098	3,087,839
Depreciation	876,962	1,617,399	.....	167,500	2,661,861
Operating revenue deductions	$14,656,594	$14,135,781	$166,549	$1,212,832	$30,171,757
Operating income	$3,574,621	$757,339	$124,459	$741,428	$5,197,849
Non-operating income (exclusive of dividends of affiliated companies)	184,938	12,684	1,226	29,030	227,880
Gross income	$3,759,560	$770,024	$125,685	$770,459	$5,425,729
Income deductions (bond interest, rentals and miscellaneous interest charges)	5,076,875	256,356	95,399	37,903	5,466,535
Net income or loss	*$1,317,315	$513,668	$30,286	$732,555	*$40,805
Profit and loss accounts (excluding dividends)	†3,910	†6,003	675	.....	†9,238
Surplus (before dividends)	*$1,313,405	$519,672	$29,611	$732,555	*$31,566
Intercompany dividends	†324,574	.....	.....	324,574	.....
	*$988,831	$519,672	$29,611	$407,981	*$31,566
Dividends paid unaffiliated interests (directors)	.....	.....	.....	226	226
Net increase or decrease in surplus	*$988,831	$519,672	$29,611	$407,755	$31,792

*Deficit. †Credit.

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OPERATING REVENUE OF SUBSIDIARY UTILITY COMPANIES OF PUBLIC SERVICE CORPORATION

Year	Electric Properties	Gas Properties	Transportation Properties	Total
1918	17,587,806	14,578,269	20,831,762	52,997,838
1919	20,054,659	14,941,745	24,140,356	59,136,762
1920	23,563,929	20,872,062	27,882,095	72,318,082
1921	24,390,321	23,516,318	27,404,867	75,311,507
1922	27,660,026	23,152,426	27,544,509	78,356,967
1923	31,188,595	24,814,283	23,105,003	79,107,882
1924	34,889,632	24,542,643	28,257,177	87,689,453
*1925	40,016,174	24,181,431	30,517,918	94,715,525
1926	46,954,362	26,286,246	33,062,600	106,303,209
1927	52,393,848	27,242,453	35,369,607	115,005,908

*Change in classification of accounts effective Jan. 1.

ing to the Reading ferries, and Mount Holly and Swedesboro line buses, which had previously operated to the Pennsylvania ferries, was established at the Court House, Camden. This plan met with the approval of the citizens of Camden who desired to have "the transportation package broken" in that city and provided direct connection with Pennjersey buses operating over the Camden bridge into Philadelphia.

The labor turn-over in 1927 was the lowest in a number of years. The no-accident bonus system resulted for the year in payments made to 3,871 operators, and in an appreciable reduction in the number of accidents. The system modified in the light of the year's experience will be in effect during 1928. In addition to individual bonuses, awards will be made to the men assigned to the carhouse or garage in each division which makes the best showing in reducing accidents in each of three four-month periods into which the year is divided.

During the year the Public Service Rapid Transit Railroad was organized to take over the North Jersey Rapid Transit Company, the lines of which extended from Ridgewood Junction to Suffern, N. Y.

On Dec. 31, 1927, the mileage of railway and railroad lines amounted to 878.319 miles. During 1927 single-track extension amounted to 1.066 miles; 18.101 miles of track were relaid with new rail and 2.024 miles with old rail.

Six hundred and fifty-two cars were completely overhauled, 2,288 cars received general repairs, 1,272 cars were painted, vestibule window cleaners were installed on 1,355 cars, ten improved type snow sweepers were built, and a large amount of other work was done in the company shops.

The bus fleet was added to and improved. One hundred and fifty-six new buses for additional service and 125 new buses for replacement were purchased in addition to 146 buses bought from independent owners. Eighty-two buses were completely and 639 buses partially overhauled, 926 buses were painted, 384 bus engines were overhauled, 65 bus bodies and two wrecking cars were built in the company shops.

On August 4, 1927, the Board of Public Utility Commissioners handed down its decision upon the application of Public Service Railway and Public Service Transportation Company for the adjustment of fare zones. The petition, in which was embodied the new tariff, was handed to the commission on Dec. 13, 1926. The operation of the tariff was suspended by the board and a number of hearings held thereon. Under the order of the board, the street car and fare zones under consideration, with some modification of the tariff filed by the company, were made coincident.

$1,562,714 Paid to City by Chicago Railway

Authorization was given by Federal Judge James H. Wilkerson to the receivers of the Chicago Railways, comprising the north and west lines, to pay to the city by April 10, $1,562,714. This amount is the 55 per cent of the net receipts of the company due to the city under the franchise for the fiscal year ending Jan. 31, 1928.

Earnings in Kansas City Short of Agreed Limit

Earnings of the Kansas City Public Service Company, Kansas City, Mo., in 1927 fell 25 per cent below the amount permitted under the new franchise. In January, 1927, the shortage was $14,188 and for January this year the shortage was $45,303. For the first two months last year the shortage was $45,028, and in a similar period of this year it was $109,747.

According to the company it should have earned $2,065,110 last year under the franchise allowance, while the net earnings were only $1,611,689. Under the franchise the company is allowed to earn $2,000,000, plus 8 per cent on additions to capital. The figures in the statement as to the capital earnings are based upon estimate of 50 per cent of the amount spent for improvements as capital expenditures.

From Jan. 1 to March 18 revenue car passengers decreased 879,836 compared with a similar period in 1927.

Denton-Terrell Operation Shows Loss

Operations of the lines of the Texas Interurban Railway, one running from Dallas to Denton and the other from Dallas to Terrell, showed a loss of $241,720 on March 1, according to figures compiled by Richard Meriwether, vice-president and general manager of the company. The Denton line, placed in operation Oct. 1, 1924, is $307,584 short of earning the interest charges on its notes, while the Terrell line, started Jan. 14, 1923, has earned a net income of $65,864 in its slightly more than five years of operation.

Operating revenues of the Denton line have dropped each month since the line was placed in service, and the Terrell line has failed to earn operating expenses during the last two months. Up to March 1, the Denton line showed operating revenues of $421,498 and operating expenses of $493,986. The Terrell line did fairly well the first two years, but business has been poor re-

TRANSPORTATION STATISTICS OF PUBLIC SERVICE CORPORATION

Year	Trolley Passengers	Bus Passengers	Total Passengers	Trolley Mileage	Bus Mileage	Total Mileage	Trolley Hours	Bus Hours	Total Hours	Passenger Receipts Per Trolley Mile Cents	Passenger Receipts Per Bus Mile Cents
1918	451,220,806	.....	451,220,806	54,039,150	.....	54,039,150	5,698,089	.....	5,698,089	36.00	.....
1919*	396,689,234	.....	396,689,234	57,644,927	.....	57,644,927	6,039,453	.....	6,039,453	39.29	.....
1920	543,505,154	.....	453,505,154	60,798,743	.....	60,798,743	6,539,207	.....	6,539,207	43.21	.....
1921	435,679,801	.....	435,679,801	58,309,883	.....	58,309,883	6,212,276	.....	6,212,276	44.11	.....
1922	410,212,814	.....	410,212,814	56,419,982	.....	56,419,982	5,983,122	.....	5,983,122	45.59	.....
1923	354,194,933	1,952,059	356,146,992	49,272,078	505,322	49,777,400	5,206,092	60,663	5,266,755	42.75	22.43
1924	427,828,444	76,451,240	504,279,684	53,945,515	15,704,663	69,650,178	5,662,340	1,928,498	7,590,838	41.04	26.13
1925	416,788,621	146,053,237	562,841,858	50,115,119	27,506,493	77,621,612	5,402,008	3,273,801	8,675,809	41.32	27.41
1926	397,690,308	199,640,564	597,330,872	45,632,230	36,082,405	81,714,635	4,929,558	4,013,602	8,943,160	42.88	39.05
1927	361,073,065	266,079,948	627,153,013	42,224,517	49,106,910	91,331,427	4,549,538	5,059,313	9,608,851	42.13	30 05

*Mile zone system in effect from September 14 to December 7.

MILEAGE—DECEMBER 31, 1927

First main track		527.683 miles
Second main track and turnouts		293.209 miles
Connections, crossovers, wyes and loops		11.920 miles
Carhouse and yard tracks		45.507 miles
Total		878.319 miles
Total number of passenger cars available for operation:	Closed—1823	Open—277
Number of new passenger cars since 1933:	Closed—1493	Open—327
Track reconstructed with new rail during 1927		18.101 miles
Track reconstructed with same rail during 1927		2.024 miles
Extensions built during 1927		1.066 miles

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cently. During its operating life, up to March 1, the line showed a net operating revenue of $440,465 and a non-operating revenue of $15,513, or a total revenue of $455,978. The interest charges totaled $390,114.

Hourly service, installed when the line was started, is being maintained.

The Denton line is 38.5 miles long, the tracks of the Missouri-Kansas-Texas Railroad being used most of the distance. The Terrell line is 30.5 miles long. Both were built under terms of an agreement made when the city of Dallas awarded a new franchise to the Dallas Railway, now the Dallas Railway & Terminal Company.

Net Income in Buffalo $100,146

Comparative income accounts for the years 1927 and 1926 have been submitted by B. J. Yungbluth, president of the International Railway, Buffalo, N. Y., to the stockholders. The figures are as follows:

INCOME ACCOUNT OF INTERNATIONAL RAILWAY YEARS ENDED DEC. 31,

	1927	1926
Passenger revenue	$10,006,590	$10,284,382
Other revenue	355,773	365,989
Operating revenue	10,362,364	10,650,371
Way and structures, equipment and power		
Maintenance	1,545,790	1,571,709
Depreciation and renewals	1,016,000	1,016,000
	2,561,790	2,587,709
Power operation	618,573	648,086
Conducting transportation	2,778,973	2,999,941
General and miscellaneous	2,212,214	2,216,135
Taxes	741,919	741,405
Operation and taxes	8,913,470	9,193,276
Operating income	1,448,893	1,457,094
Non-operating income	73,247	49,799
Gross income	1,522,141	1,506,894
Interest	1,326,708	1,363,017
Rentals	46,223	46,131
Amortization of discount	49,063	49,136
Income deductions	1,421,994	1,458,284
Net income	$100,146	$48,609

$263,055 Available in San Diego for Charges and Surplus

The San Diego Electric Railway, San Diego, Cal., reports to the Railroad Commission its 1927 operating revenue at $1,676,501 compared with $1,667,519 for 1926. The operating expenses, excluding taxes for 1927, are $1,381,324 and $1,350,373 for 1926, leaving a net operating revenue of $295,176 for 1927, and $317,146 for 1926. During 1927 taxes charged to operation amounted to $124,387 and for 1926 to $113,828. Deducting the taxes leaves operating income of $170,789 for 1927, and $203,318 for 1926. Adding to the operating income, the non-operating income of the company and deducting non-collectible revenue and rents, results in a gross corporate income, which represents the amount available for interest, amortization of debt discount, other fixed charges, non-operating expenses, dividends and surplus of $263,055 for 1927, compared with $292,053 for 1926.

4 Per Cent Public Utility Bonds

PERHAPS the most vivid illustration of the downward trend in bond yields during the past few years has taken place in the list of public utility securities. Investment bankers recall that only a few years ago the ruling rates on utility bonds ranged from 6 and 7 to 8 per cent. In no other group, however, has the refunding operations into lower interest bearing issues been so rapid or extensive as among the utilities and perhaps in no other group has the intrinsic value of securities appreciated more. With many of the recent 4½ per cent offerings now selling substantially above par, a 4 per cent coupon rate on utility bonds may not be far off. —*Wall Street News.*

Expansion in Maine Reported by Insull Interests

The Insull interests are negotiating for the control of the Cumberland County Power & Light Company, Portland, Me., to be merged with the Insull-controlled New England Public Service Company. The latter company operates properties in Maine, New Hampshire and Vermont.

$973,544 Paid in Tampa for Transportation

Transportation earnings of the Tampa Electric Company, Tampa, Fla., for the year ended Dec. 31, 1927, were $993,214 compared with $1,279,941 for the year ended Dec. 31, 1926. According to the annual report of the stockholders 18,756,851 passengers paid $973,544 for transportation; the revenue balance of $19,669 came from miscellaneous sources such as special concessions, special cars and rent of equipment. Operating expenses in the transportation department were $548,208 and transportation maintenance was $166,613.

The company owns 158 cars and 31 buses.

The number of passengers carried, excluding transfers over a period of years, was as follows:

1916	10,872,102	1922	17,032,058
1917	11,107,645	1923	16,451,400
1918	11,958,831	1924	16,123,569
1919	14,247,180	1925	21,641,839
1920	15,260,820	1926	23,920,188
1921	17,224,084	1927	18,756,851

Nebraska Interurban to Go Out of Business

The Omaha, Lincoln & Beatrice Railway, built only to the Lincoln suburb of Bethany but with a roadbed constructed for some distance out of Omaha, is shortly to go out of existence, according to General Manager Bramlette. Although it has never paid operating expenses its owners, residents of Akron, Ohio, were content to keep it running. Recent orders on paving by the City Council have placed a burden of cost that the road is reluctant to assume, and abandonment of the track within the proposed paving district has been asked.

Holders of Illinois Power & Light Urged to Convert Preferred

Clement Studebaker, Jr., president of the Illinois Power & Light Corporation, Chicago, Ill., in a statement made to the holders of the preferred stock of the company enclosed with the April 1 dividend checks said:

You previously have been advised of the possibility of your 7 per cent cumulative preferred stock being called for redemption at $105 a share plus dividend accrued to date of call, and of the plan to create a new class of cumulative preferred stock to be offered in its place.

As stated, this plan is subject to the favorable action of the stockholders and the approval of the Illinois Commerce Commission. After such acceptance and approval, the call will be made.

It is gratifying to us that the 7 per cent stock has proved such a profitable investment for each of our stockholders and when definite notice of call and offer is received, we trust you will accept our offer to reinvest your funds with us in our new $6 dividend cumulative preferred stock. Many stockholders have indicated their desire to reinvest their funds in this company, with whose affairs they have grown so familiar, and we sincerely hope you will not dispose of your 7 per cent preferred stock or make commitment for reinvestment until you have received our exchange offer.

The plan of the company to call the 7 per cent preferred stock was described in the ELECTRIC RAILWAY JOURNAL for Feb. 25, page 339.

New Director for Scioto Valley Line

Gilbert L. Fuller has been elected a member of the board of directors of the Scioto Valley Railway & Power Company, Columbus, Ohio, to fill the vacancy caused by the death of the late F. R. Huntington, Columbus banker.

Defunct Material Taken Over in Olean

The city of Olean, N. Y., will take over the bridges, real estate, power lines and tracks of the defunct Olean, Bradford & Salamanca Railway, within the city limits, on or before May 1. The compromise has been agreed upon between the receivers for the company and city officials following a year's litigation.

At the time the railway suspended operations it was in arrears more than $10,000 in city taxes and in excess of $26,000 in paving assessments.

In the summer of 1927 Supreme Court Justice Noonan issued an order authorizing the receiver of the Olean, Bradford & Salamanca Railway to discontinue operation of the interurban line between Bradford, Pa., and Salamanca, N. Y., and scrap the properties.

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Legal Notes

CALIFORNIA—*Duty of Person Driving Automobile on Car Track.*

While a person who is driving a vehicle along or in close proximity to a car track is not bound to keep a constant watch behind for approaching cars, it is his duty to turn off the track when he sees or hears a car approaching from the rear, or could see or hear it by the exercise of reasonable care. He should listen for signals of approaching cars and should heed any that he may hear. [Berguin vs. Pacific E. R. Co. 263 P., 220.]

FEDERAL CIRCUIT COURT—*Jurisdiction of Federal Court Should Be Liberally Exercised. Duration of Grants Without Time Limit.*

When the jurisdiction of a federal court is called in question, the subject should be construed liberally so that the case in point may be indubitably heard and determined. When acting in a proprietary capacity, a city is subject to many of the same restrictions as a private individual. Where grants by a city of right-of-way to a street railway are unlimited as to duration and contain the power of assignment, the grants are without time limit in the absence of constitutional or statutory limitations. [City of Denver vs. Denver T. C., 23 F. (2d), 287.]

ILLINOIS—*Commission Cannot Grant Certificate to Competing Company When Existing Service Is Adequate.*

Overwhelming testimony indicated that the service a bus company was giving was adequate. A competing company received a certificate because it offered a longer route. It was held that that the commission could require additions to and modifications of the service of the existing company, but could not refuse to renew its certificate if it was willing to make these changes. [Wilcox Transportation Co. vs. Commerce Commission, 159 N.E. 788.]

MASSACHUSETTS—*Street Railway Is Liable for Injuries Caused by Improper Removal of Snow From Its Tracks.*

A street railway has the right to remove snow from its tracks, but it is bound to exercise reasonable care and diligence in doing so, and if it negligently produces an obstruction rendering traveling unsafe, it is liable for injuries caused thereby. [Graul vs. Boston Elevated Railway Co., 159 N.E., 606.]

NEW YORK.—*Operation of Motor Bus Without Authority Does Not Preclude Recovery for Injury to Bus in Collision.*

A motor bus in New York was operating under a permit from the Department of Plant and Structures of the city, but the Public Service Commission had not given its approval to the operation so that the bus was illegally carrying on the business of a common carrier of passengers. This violation of the statute, however, had no direct connection with the injury which it suffered from a collision. The illegality consisted not in the operation and use of the streets by the bus, but in the carrying of passengers for hire. It is only in the case where a violation of a statute or an ordinance has such a direct connection with the injury which has been received as to form and be a part of the act causing the injury that the law bars recovery for the injury received. Moreover, the statute governing the licensing of common carriers prescribes penalties for failure to comply with them. The courts must not add other penalties. It cannot be said that the bus, within the meaning of the law, was a public nuisance and interfering and obstructing the streets when it was legally on the streets, although used for an unauthorized purpose. Hence, when a street car negligently injured such a bus in a collision, the railway company was responsible. [Klinkenstein vs. Third Avenue Ry., 158 N. E., 886.]

NEW YORK—*Power of Railway Company to Control the Union Affiliations of Its Employees Is Defined.*

This was a suit of injunction brought by the Interborough Rapid Transit Company against E. P. Lavin individually and as president of a union to prohibit him and other defendants from inducing the company employees to leave its employ. It also asked damages for acts during the strike in July, 1926. As a result of that strike the defendants were discharged from the employment of the company. The court held it could act in labor disputes only where there was a probability of unjustified interference with the company's rights. It held that the company could determine for itself the conditions of employment on its railway which will best assure the interests of public and company, provided it can induce sufficient workers to accept these conditions. It may refuse to employ workers who will not make an agreement that they will not join a particular union or combination of workers while in the company's employ. The company claimed that it had done this when it had accepted the constitution of a brotherhood of its employees, one of whose rules obligated its members not to become identified in any manner with the Amalgamated Association, or any other association of street railway or other employees, with the exception of the brotherhood, and that a violation of this agreement would constitute cause for dismissal from the employ of the company. The court held that this condition did not necessarily imply a binding contract between the company and each individual employee, as the parties directly concerned were the brotherhood and the employees. Efforts of the defendants to instigate a strike while in the employ of the company or to recruit members for the Amalgamated Association after they had left the company's employ are not necessarily unlawful acts, though they may be so. Extracts from this portion of the decision were published on page 92 of the issue of this paper for Jan. 14, 1928. In the belief that the original injunction was too broad, the Court of Appeals remitted the motion to the special term, so that it might exercise its discretion as to whether an injunction of more limited scope should issue upon the facts contained in the record. [Interborough Rapid Transit Co. vs. Lavin et al. 159 N. E. 863.]

OHIO.—*Stoppage of Automobile on Wrong Side of Street Except Because of Emergency or Some Regulation of Law Is Negligence per se and Not Prima Facie Negligence.*

While an automobile was crossing a bridge over a steam railroad, smoke from a passing train partly obscured the roadway and to avoid it the driver turned to the left-hand side of the road where he was struck by a trolley car. In the trial court the judge read to the jury sections of the general code which forbade a driver to obstruct the left-hand side of the road except "by reason of other lawful regulations or emergencies." Judgment for the plaintiff was reversed in the Court of Appeals on the ground that this action gave the jury the impression that the action of the driver was justified. It was not, as there was no such emergency. Violation of a statute is negligence per se and not prima facie negligence. [Cleveland Ry. vs. Kuncic, 159 N.E., 96.]

TEXAS—*Injury to Automobile Guest Where Motorman Discovers Peril After Driver's Negligence.*

In a personal injury action against an automobile driver and a railway company by an automobile guest, the jury found the railway was negligent after the peril was discovered. This was held not to affect the error of the trial court in refusing to submit to the jury the issue whether the automobile driver's negligence in failing to keep a lookout was not the sole proximate cause of the injury. [Northern Texas T. Co. vs. Woodall et al., 299 S.W., 220.]

WYOMING—*Grant by Commission Subject to Change by State.*

A certificate of public convenience and necessity, issued to a transportation company, may be altered later as it is subject to a reasonable exercise of the state's police power. Anyone attacking a statute as unconstitutional must point out the specific constitutional provisions claimed to be violated and show that the statute is unconstitutional as to himself, not merely that it is unconstitutional as to other persons or classes. [Salt Creek T. Co. vs. Public Service Commission, 263 P., 621.]

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Personal Items

Frank Pick of London Honored

Frank Pick, formerly joint assistant managing director, of the Metropolitan District, London Electric, City & South London, and Central London Railways, and the London General Omnibus Company, has now become managing director.

In 1902 he entered the service of the North Eastern Railway under Sir George Gibb, then general manager, and worked successively in the statistics office, district superintendent's offices at Sunderland and Newcastle-on-Tyne, the rates offices and, finally, in the general manager's office. In 1906 he removed to London with Sir George Gibb when Sir George took over the management of the Metropolitan District and London Electric Railways. Upon Mr. Gibb's retirement in 1907, Mr. Pick was transferred to the staff of A. H. Stanley, now Lord Ashfield. He was born at Spalding in Lincolnshire in 1878. He was educated at St. Peter's School, York, and was later articled with George Crombio, solicitor, York. In 1902 he qualified as a solicitor and in 1903 became L.L.B. (London University).

C. E. Morris in Toledo

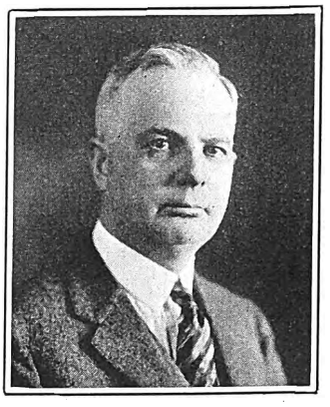
Coincident with the announcement of plans to speed up the service of the Community Traction Company, Toledo, Superintendent Forsgard made it known that C. E. Morris, until recently schedule engineer with the Cleveland Railway, Cleveland, Ohio, has been named superintendent of schedules for the Community Traction Company. Mr. Morris previously had considerable experience in schedule work for the United Railways & Electric Company of Baltimore. He is making a study of the schedules on a number of lines other than the Cherry Hill one, on which changes have been made, and similar plans for bettering service on other lines are to be announced soon.

"Goofy" Complaints in Omaha Investigated

The difficulties of pacifying railway employees and patrons in Omaha, Neb., were recounted in the March 11 issue of the Omaha *Bee-News* in an interview with William C. Baughman, the new head of the newly-established complaint department of the Omaha & Council Bluffs Street Railway. Mr. Baughman tells about the wailings of the woman who tore her sheer hose and the argument of the defiant motorman who just wouldn't let a passenger open the window on a freezing night. He at one time piloted one of the cars on the Dundee line. After serving as trainman for eight years he spent eight more years in the lost and found department and the claim department. He hasn't much time to complain himself—he's so busy adjusting the troubled affairs of others. When President Shannahan moved to Omaha he announced that every deficiency in the service had to be eliminated and this complaint department is part of this idea. But Mr. Baughman says "we don't think much of the ordinary knockers, the folks who write in and tell us what is wrong with the service, but refuse to sign their names." He adds that where the complaints were merited additional service had been installed as a result of their reception.

Official of Binghamton Railway in City Post

Vine W. Burley, superintendent of the Binghamton Railway, Binghamton, N. Y., is a railway official who has given serious heed to the admonition of the soothsayers of the electric railway



V. W. Burley

industry that men engaged in railway work shall do something for communities other than just run their railroad, no matter how well they may do that. In consequence, ever since Jan. 1 Mr. Burley has been commissioner of public work of Binghamton, to which office he was appointed on Jan. 1 by Mayor-elect Norman A. Boyd.

It is said that at first Mr. Burley doubted his ability to serve two masters successfully, but if he did have any doubts his mind was relieved of them by William H. Riley, receiver of the railway, who would not listen to the idea of the railway losing so competent an official. As a result the city is happy, Receiver Riley is happy, and the employers of the Binghamton Railway are happy—and Mr. Burley is happy, but busy. Not only is Mr. Burley getting lots of different kinds of experience in his city post, but he is enjoying the work. He spends certain hours each dav with the railway, and it is perhaps not without the pale and in accordance with facts to say that he really likes his work with the railway better than he does that with the city.

In announcing his selection of Mr. Burley, Mayor-elect Boyd said the appointment was a purely personal one and had been made without reference to politics, as he had not inquired whether Mr. Burley was a Republican or a Democrat. The Mayor said:

I have chosen Mr. Burley because I believe him to be well qualified for the important position he is called upon to fill, and that the best interests of the taxpayers will be served in making this appointment.

Mr. Burley is a man of wide experience in handling men, has held responsible executive positions in the past and is possessed of ability that will prove of great value to the taxpayers.

Certainly the Mayor appraised him correctly when he said Mr. Burley would aim to operate the department of public works on a practical basis and give the taxpayers full value for money expended.

Mr. Burley was born in Mills, Pa. He worked his way through Cayuga College, graduating with the highest honors in his class. He became associated with the Pennsylvania Railroad and rose to a position that gave him charge of the engineers and firemen on that road. His headquarters were in Philadelphia, and he was connected with the road for ten years, leaving Philadelphia seventeen years ago to go to Binghamton as superintendent of the Binghamton Railway.

Obituary

Dr. Delos F. Wilcox

Dr. Delos Franklin Wilcox, franchise and public utility authority, author and lecturer, died of pneumonia on April 4 in New York after a brief illness. In his practice as a public utility expert he advised many cities on franchise, rate and valuation matters. Dr. Wilcox was much in the public eye in connection with this work, but was probably most widely known for his advocacy of municipal ownership and for his book in two volumes "Municipal Franchises." Dr. Wilcox was also the author of many shorter treatises on municipal problems. His writings were noted for their clearness and the force with which he presented his ideas.

Born in 1873 near Monroe, Mich., Dr. Wilcox was educated at the University of Michigan and Columbia University, receiving the degree of Ph.D. from the latter. For some years he was engaged in work relating to improved city government, first in Cleveland and later at Grand Rapids and Detroit.

In 1907 he came to New York to become chief of the bureau of franchises of the Public Service Commission for the First District, which was then being organized. He resigned in 1913 to enter private practice as a public utility expert. In 1914 he was appointed deputy water commissioner of the City of New York by Mayor Mitchel. He resigned from this post in 1917 to resume his private practice. In 1919-20 he acted as adviser to the Federal Electric Railways Commission.

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Manufactures *and the* Markets

Employment Situation Basically Sound

Surveys by government departments and others indicate less unemployment than some persons have intimated. A great readjustment in industrial employment is taking place

By Julius Klein

Director Bureau of Foreign and Domestic Commerce

IN ESTIMATING the present situation there seems to be a prevailing tendency simply to take statistical soundings as to the depth of the business stream at random spots, with only an occasional effort to gage the force and direction of its current, its general trend, whence it has come and whither it is carrying our commercial and industrial crafts—and at what speed. After all, the outstanding feature of our business life is its extreme mobility.

The type of queries as to current conditions which are now coming to the Department of Commerce—and our inquirers now number 10,300 a day on the average—indicate certain definite shortcomings of our present business statistical apparatus. In the first place, there is entirely too much of it; at least the average merchant or industrialist who hasn't a staff of business analysts in his own business organization seems to think so. He feels the necessity of having segregated for him a few outstanding figures of prime utility for his purposes. This task of selection is clearly one in which his trade association and business papers can be of immediate and special help. The business community no longer wants "bigger statistics," but better ones. Secondly, our correspondents complain of a persistent tendency to overwork available figures.

Thirdly, on the major problem of unemployment, we are clearly behind Europe in the accuracy of our statistical data. It is most gratifying that the Department of Labor has undertaken an authoritative study, and it is hoped that it may lead to a systematic check of this highly important problem.

A characteristic instance was in the case of the Baltimore figures, which were given at the outset as 70,000 by one group of advocates, subsequently as 36,000 by another agency, whereas the actual house-to-house count by the Department of Labor revealed only 17,000.

A fourth weakness in our business figures, as currently interpreted, has been revealed in miscalculations in some quarters based upon the returns from chain stores and mail order houses. The increasing gross returns from these sources have been taken to indicate improved buying power in spite of the clearly evident factor that in each case the number of stores involved has been notably increased. If deductions are made for this factor, the returns in the main do not indicate any *relative* increases in business.

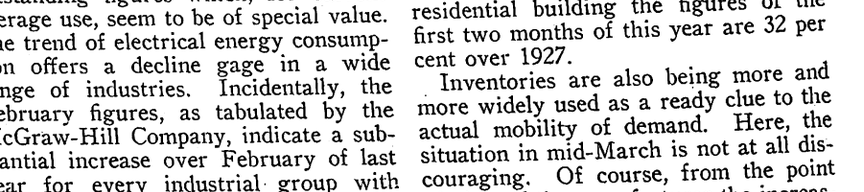
Broadly speaking, there are just a few outstanding figures which, for current average use, seem to be of special value. The trend of electrical energy consumption offers a decline gage in a wide range of industries. Incidentally, the February figures, as tabulated by the McGraw-Hill Company, indicate a substantial increase over February of last year for every industrial group with the exception of lumber. In some cases the gain is unusually high—nearly 42 per cent in the case of rubber, nearly 40 per cent in automobiles, nearly 29 per cent in stone, clay and glass, more than 26 per cent in metal working plants, 21 per cent in rolling mills and steel plants, and 18.5 per cent in chemical and allied products.

Another figure, which seems to be getting wider currency, is that of the Department of Commerce on building contracts, as distinguished from simply permits. Here again the figures are encouraging, running 10 per cent higher during the first ten weeks of 1928 as compared with a year ago. Indeed, in residential building the figures of the first two months of this year are 32 per cent over 1927.

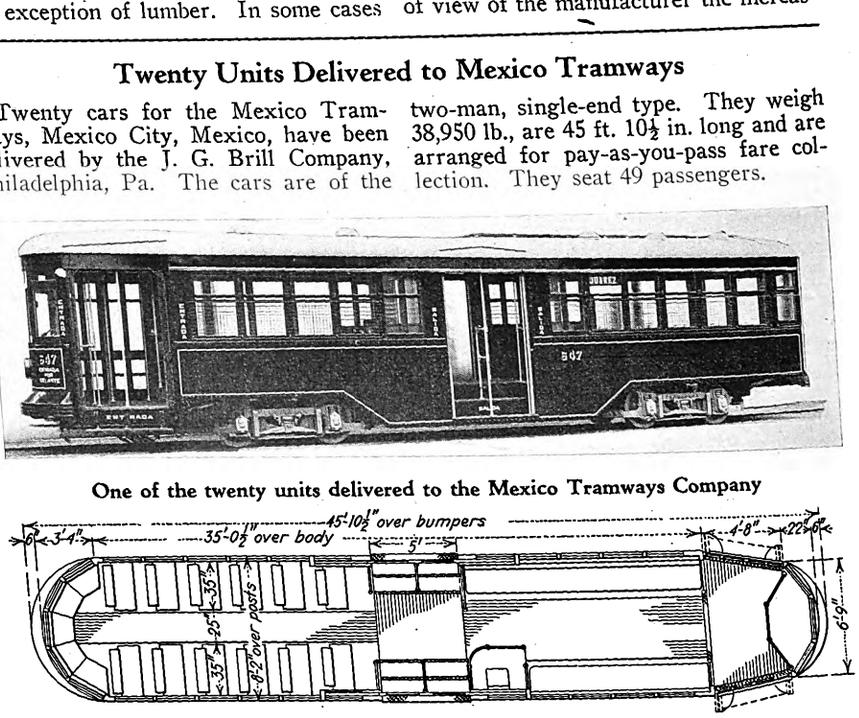
Inventories are also being more and more widely used as a ready clue to the actual mobility of demand. Here, the situation in mid-March is not at all discouraging. Of course, from the point of view of the manufacturer the increas-

Twenty Units Delivered to Mexico Tramways

Twenty cars for the Mexico Tramways, Mexico City, Mexico, have been delivered by the J. G. Brill Company, Philadelphia, Pa. The cars are of the two-man, single-end type. They weigh 38,950 lb., are 45 ft. 10½ in. long and are arranged for pay-as-you-pass fare collection. They seat 49 passengers.



One of the twenty units delivered to the Mexico Tramways Company



Floor plan of the New Mexico City cars

Name of Railway	Mexico Tramways
City and State	Mexico City, Mexico
Number of units	20
Type of unit	Two-man, motor, passenger, city, single end
Number of seats	49
Builder of car body	The J. G. Brill Company
City and state	Philadelphia, Pa.
Date of order	May 27
Date of delivery	October 27
Weights: car body	19,625 lb.
Trucks	11,935 lb.
Equipment	7,390 lb.
Total	38,950 lb.
Bolster centers	23 ft. 3½ in.
Length over all	45 ft. 10½ in.
Length over body posts	35 ft. 0½ in.
Truck wheelbase	4 ft. 10 in.
Width over all	8 ft. 4 in.
Height, rail to trolley base	10 ft. 11½ in.
Window post spacing	2 ft. 5 in.
Body	Semi-steel
Roof	Arch
Doors	Center-exit, end-entrance
Air brakes	General Electric
Armature bearings	Plain
Axles	A.S.T.M. annealed
Car signal system	Faraday buzzers
Compressors	CP-28-D
Conduit	Metal
Control	Type K
Couplers	Brill self-supporting radial
Curtain fixtures	Curtain Supply Company
Curtain material	Pantasote
Destination signs	Hunter
Door mechanism	National Pneumatic
Doors	Folding-end, sliding-center
Fare boxes	Cox
Finish	Enamel
Gears and pinions	General Electric Grade M
Glass	D.T.A.
Hand brakes	Brill
Hand rails	Aluminum
Headlights	Crouse-Hinds
Headlining	Agasote
Interior trim	Cherry-stained and aluminum
Journal bearings	Plain
Journal boxes	Brill
Lamp fixtures	General Electric
Motors	Four G.E.-275A, outside hung
Painting scheme	Durban red
Roof m terial	Canvas
Safety car devices	Door interlock
Sash fixtures	National Lock Washer Company
Seats	Brill
Seat spacing	2 ft. 4½ in.
Seating material	Cherry slat
Steps	Front-folding, center-stationary
Step treads	Feralun
Trolley catchers	Earle
Trolley base	U. S.-13
Trolley wheels	General Electric No. 48
Trucks	Brill 76-E-1
Ventilators	Brill exhaust type
Wheels, rolled steel	28 in. diameter
Wheelguards	Root lifeguard

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ing tendency toward hand-to-mouth buying, which is in part the explanation for the prevailing favorable low position of inventories, is not an altogether attractive indicator.

Two commodity figures, which are less widely used but which offer attractive possibilities as definite indicators, are the trends in consumption of machine tools and of office appliances. These are both rather definite indices of the readiness of the manufacturer and merchant to back up their judgment as to the outlook with concrete preparations.

In addition to these factors there are, of course, the basic ones of the availability of credit and the conditions in such major industries as automobiles and steel. Automobile production, exclusive of the Ford operations, is now more than 33 per cent over figures for the corresponding period of 1927.

March operations in iron and steel continued at the February rate of 85 per cent compared with 91 per cent a year ago. Price advances are being maintained and the prospects continue favorable.

The trend of our imports is also being noted by competent observers as a useful index of the growing demand for raw materials. February imports exceeded $353,000,000, which was 13.5 per cent larger than February, 1927, though, of course, it must be remembered that there was one more day in the month this year.

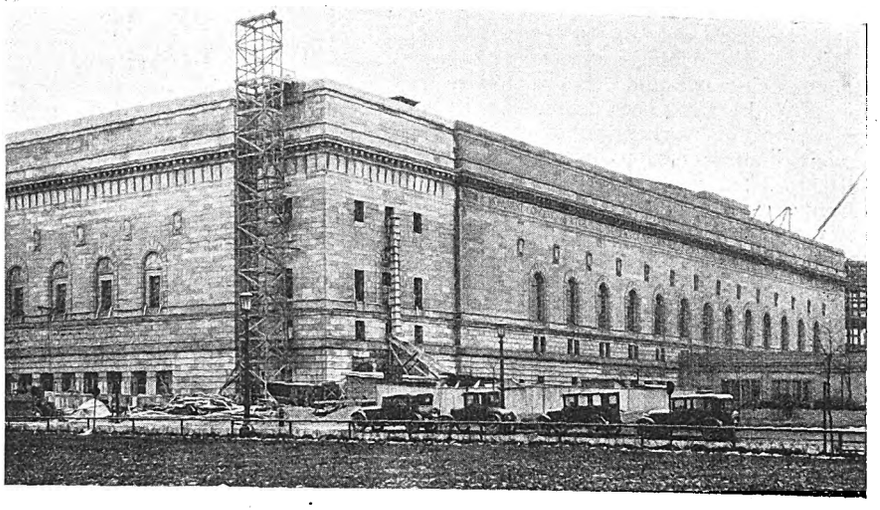
With reference to the unemployment situation, precise figures are not available at this writing, but preliminary indications are that the totals revealed on the basis of accurate samplings now being taken in various districts will be very materially below the estimates of recent weeks. As Secretary Davis quite properly pointed out, three-quarters of a million, even a million, unemployed is a more or less normal feature of any such vast industrial area as the United States, particularly at this seasonal turn of the year. Our real objective should be the elimination of surplus *employable* labor.

Much of the recent situation was quite evidently seasonal, and even more of it was sharply regional. The tendency of all too many casual observers was to generalize on the basis of momentary local observations. Fundamental variations are constantly going on, not only as among different regions at any one time, but also in any one region over a period of seasons. This obvious truism seems to have been overlooked by some current observers.

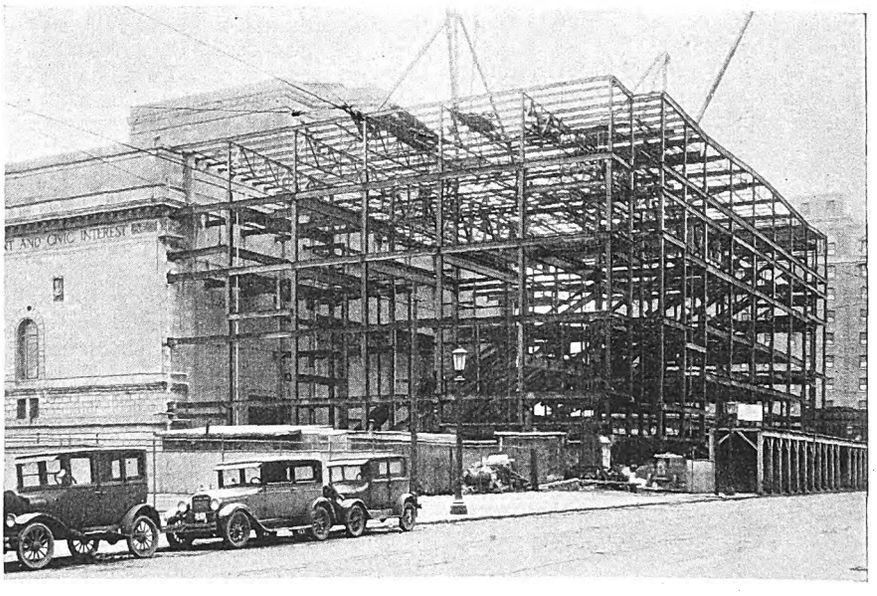
The shrewdest perception of our most erudite counsellors has revealed no one panacea for this situation, not even the rigid maintenance of a high wage scale. Invaluable though that factor is as a rule, it can on occasions be carried to disastrous extremes. One of the most helpful contributions toward the alleviation of this regrettable accompaniment of every profound industrial evolution such as ours, was that recommended by Secretary Hoover at the time of the Unemployment Conference in 1921. At that time he urged the "accurate study by civic bodies of the character of the industries in their respective centers in an endeavor to discover opportunities for integrating industries to intermesh with each other in the reduction of seasonal idleness." Another corrective which is now very much to the fore is the allocation of public works to the slump periods in the employment curve.

One of the inevitable costs of our progress in waste elimination and in more efficient protective methods has been the displacement of labor. This

Space Applications for A.E.R.A. Show Ready



The Lakeside Avenue side of the Cleveland Public Auditorium, which is almost completed. It contains lobby accommodations, restaurant, lounge, meeting room and a grand ball room



When the St. Clair Avenue side of the auditorium is finished it will have facilities for two theaters

Applications for show space at the 47th annual gathering of the American Electric Railway Association, to be held in Cleveland from Sept. 22 to 28, inclusive, will be mailed to all members on April 14. The Cleveland show will open promptly at 9:00 a.m. Saturday, Sept. 22. All applications received up to the close of business May 14, will be awarded space by the exhibit committee, which is scheduled to meet May 16 to make the official allotment. If any space remains unsold after the initial allotment has been made, it will be assigned by the director of exhibits, in the order in which applications are received.

Exhibits will occupy both floors of the Cleveland Auditorium as well as the entire annex. The two buildings are connected with a covered passageway in which there will be operating maintenance-of-way exhibits. Track space for the display of street cars will also be provided.

Railway material, cars, buses and bus accessories, shop tools, garage equipment, etc., will be shown, as well as many other items pertinent to the transportation industry. An unusually large and varied display is expected. Last year there were 293 exhibiting companies and a total of 8,024 delegates.

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development, plus the deflation of our wartime industrial abnormality, has resulted in a net decrease in employees in our factories of something like 917,000 since 1920. This substantial figure, if added to the 800,000 represented in the decline of employees in agriculture and the 240,000 relieved from the railroads since the war, gives a formidable total of displaced labor of nearly two millions.

There has, however, been a most helpful corrective, which has taken up most, though perhaps not all, of the slack, namely the astonishing increase in non-manufacturing pursuits. For example, since 1920 there has been an increase in the number of workers in automobile servicing and distribution of nearly 760,000. There are nearly 100,000 more insurance agents clamoring at our doors today than in 1919. Another 100,000 increase is estimated in the service employees of electric refrigeration, light and power, and oil heating establishments. The management, servicing, and general direction of construction accounts for an increase of another 100,000 in the same time. There are 232,000 more teachers and professors required today than in 1919. The increase in motion picture servitors, exclusive of production, accounts for another 125,000 added to the cinema industry since the war. It is not hard to explain the increase of 170,000 barbers and hairdressers during the same time. Service personnel of hotels and restaurants has increased by 525,000.

All of this is offered as by no means an attempt to dispute the perfectly evident fact that there is unemployment, perhaps in greater quantity today than for some months past. It is offered solely as one phase of the employment situation which is apt to be overlooked, and without which any observations upon the over-capacity of industries, or the alarming deflation of our factory payrolls through greater efficiency, simply cannot be properly understood.

The first and indispensable safeguard of our prosperity is to minimize waste, to concentrate every possible individual exertion toward widening the present rather narrow margin of profit by cutting in on production cost on the one hand and the expenses of distribution on the other. Our chief task in the future seems to lie in further economies in distributive effort. The volume of output, however, economically achieved, is of no ultimate value whatsoever in our operations without a corresponding volume of profit to the manufacturer.

Root Snow Scrapers for Holland

The Noord-Zuid-Hollandsche Tramweg Maatschappij, Haarlem, Holland, has ordered from the Root Spring Scraper Company, Kalamazoo, Mich., two No. 1 and two No. 8 snow scrapers.

An order for 38 Root life-guards has also recently been received from Pittsburgh. The 125 cars recently shipped to Detroit and the twenty cars shipped to the Mexico Tramways, Mexico City, were equipped with Root life-guards.

METAL, COAL AND MATERIAL PRICES
F. O. B. REFINERY

Metals—New York	April 3, 1928
Copper, electrolytic, cents per lb	14.00
Copper wire, cents per lb	16.125
Lead, cents per lb	6.10
Zinc, cents per lb	6.075
Tin, Straits, cents per lb	53.375
Bituminous Coal, f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	4.15
Somerset mine run, f.o.b. mines, net tons	1.875
Pittsburgh mine run, Pittsburgh, net tons	2.00
Franklin, Ill., screenings, Chicago, net tons	1.825
Central, Ill., screenings, Chicago, net tons	1.675
Kansas screenings, Kansas City, net tons	2.375
Materials	
Rubber-covered wire, N. Y., No. 14, per 1,000 ft	15.30
Weatherproof wire base, N.Y., cents per lb.	16.5125
Cement, Chicago net prices, without bags	2.05
Linseed oil (5-bbl. lots) N. Y., cents per lb.	10.00
White lead in oil (100-lb. keg), N. Y., cents per lb	13.25
Turpentine (bbl. lots), N. Y., per gal	$0.635

Northwestern Pacific to Improve

Northwestern Pacific Railroad, San Francisco, Cal., has been ordered by the California Railroad Commission to undertake immediately, and to carry out to consummation with all reasonable diligence and expedition a program of improvements of its service and facilities. The decision is the result of extensive hearings conducted by Commissioner Leon O. Whitsell, and embodies the program of improvements proposed by the engineering department of the commission, and agreed to in the main by the defendant corporation during the progress of the hearings.

In the program of improvements, the railroad was ordered to construct, in accordance with plans to be approved by the Commission, new stations at Union Station, B Street Station and West End Station, San Rafael, Marin County, Ukiah, Mendocino County, and Healdsburg, Sonoma County and reconstruct or improve, in accordance with plans to be approved by the Commission, its stations at Sausalito, Tiburon, Mill Valley and Ross, as well as maintain a reasonably high standard at other stations on its line. It is to construct, in accordance with plans to be approved by the Commission, shelter stations on the west side of the track at Almonte, Baltimore Park and Kentfield and to file with the Commission, for its approval, within three months from the date of the order, a plan providing for the elimination of the hazard of third rail operation on Second Street, San Rafael, and upon the approval of the Commission the company shall have such plan put into effect as expeditiously as possible. The third rail is to be protected with a covering at all stations and throughout the entire territory traversed by the line, except that if the company so elects, such third rail covering may be omitted in marsh territory on that portion of the line between Pine Street, Sausalito, and Almonte and between Almonte and west end of Corta Madera Tunnel, between Baltimore Park and Green Brae and between California Park and San Rafael, except at station grounds. Protective covering for third rail contact shoes and other exposed energized surfaces on all interurban equipment is also to be made.

The company must submit for the Commission's approval, within three months from the date of the order, a plan of improving the service on its San Geronimo Valley line and proceed to carry out all the recommendations with respect to improving grade crossings. It is ordered to carry out all the recommendations with respect to correcting impaired clearances and unsafe conditions in tunnels and on bridges, to proceed to improve the power situation on its lines substantially in accordance with the recommendations in the Commission's exhibit No. 2 and to submit, for the Commission's approval, a plan of renewing equipment and to promptly proceed to purchase and place in operation five new motor cars and five new trailer cars, of a detail design to be submitted to the Commission for approval within three months.

ROLLING STOCK

NEWBURGH PUBLIC SERVICE CORPORATION, Newburgh, N. Y., successor to the Orange County Traction Company, lost all but one of its fleet of 21 buses on March 30 in a fire which destroyed its garage and contents. It is understood that an order is being placed for fifteen buses to replace this equipment.

WASHINGTON RAILWAY & ELECTRIC COMPANY, Washington, D. C., has received four new double-end one-man cars from the J. G. Brill Company. These cars are the first of an order of twelve, at a total cost of $160,000.

TRACK AND LINE

TRENTON & MERCER COUNTY TRACTION CORPORATION, Trenton, N. J., will erect a new railroad crossing at State and Canal Streets.

SPRINGFIELD STREET RAILWAY, Springfield, Mass., is preparing for rehabilitation work from Holly Street to Oak Street, Indian Orchard, at a cost of approximately $17,000; special work at the corner of Main and Oak Streets, Indian Orchard, at a cost of about $6,000; and on White Street from Orange Street to Sumner Avenue at a cost of approximately $19,000.

TRADE NOTES

STANDARD AUTOMATIC SIGNAL CORPORATION, Chicago, Ill., has appointed Frank J. Lepreau as sales manager. Mr. Lepreau was formerly Chicago representative of the L. S. Brach Manufacturing Company, Newark, N. J.

IDEAL COMMUTATOR DRESSER COMPANY, Sycamore, Ill., has appointed Syracuse Supply Company, Syracuse, N. Y., as exclusive sales representative in the Syracuse territory.

W. P. BROWN & SONS LUMBER COMPANY, Louisville, Ky., has moved its creosoting department to Fourth and K Streets, Louisville.

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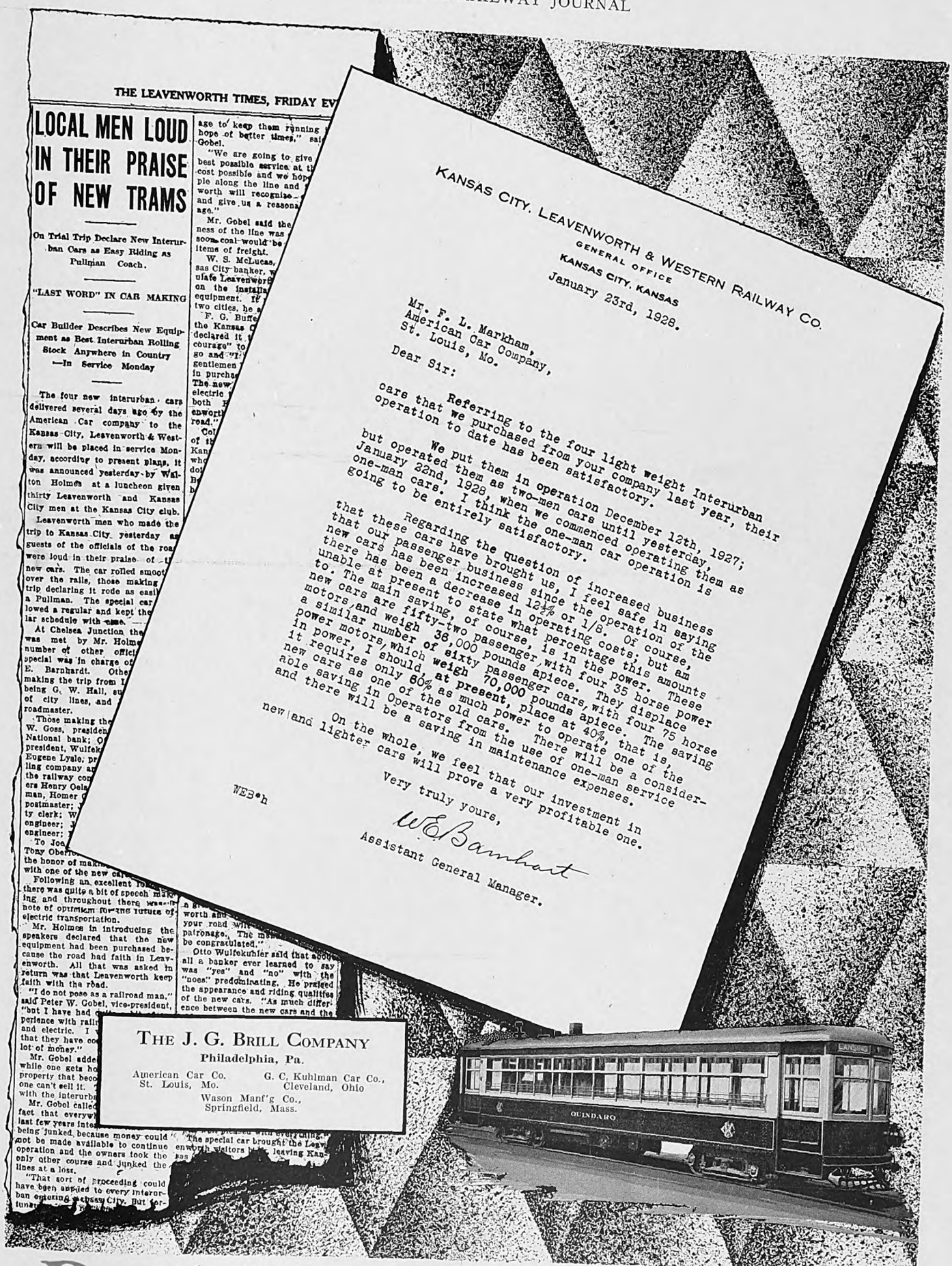

Brill Light Weight Interurban Cars

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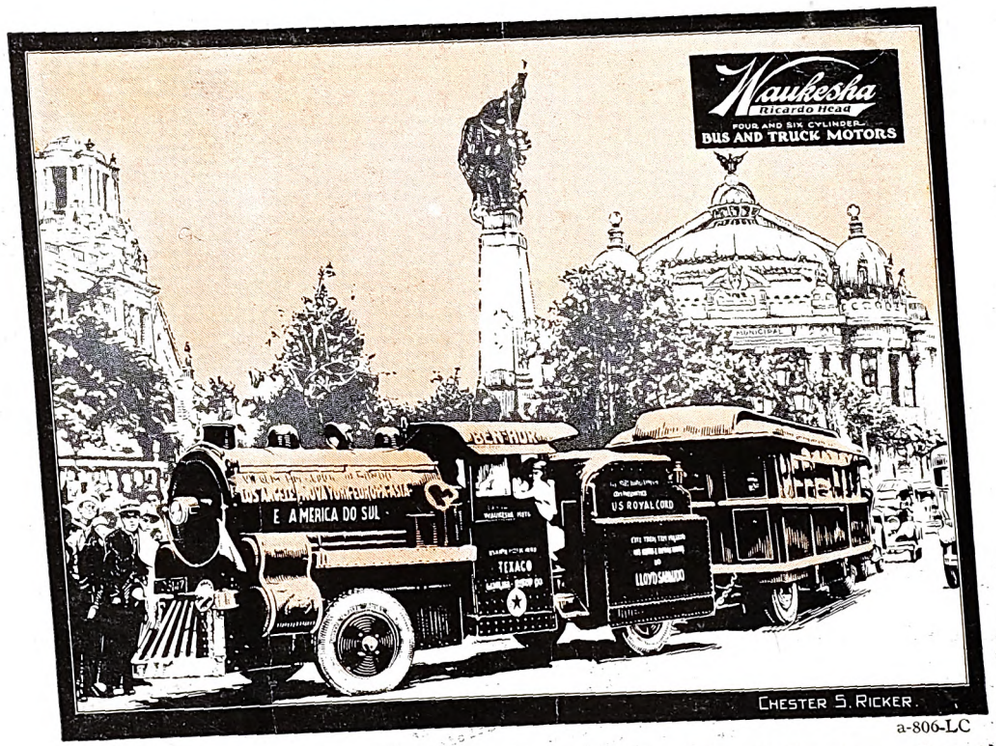

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Waukesha-Engined Metro-Goldwyn Train in Rio de Janiero, Brazil

Thru Europe and South America

This 24,000-pound motor train, capable of 45 miles per hour, is pulled by a Waukesha-powered locomotive. Battling all kinds of road and weather conditions, this remarkable train has kept on schedule through England, France, Belgium, Germany and Italy. It is shown here enroute home via the Argentine and Brazil. For over two years the Waukesha engine has operated faithfully and proved equal to its task.

Engine reliability is of paramount importance on a job like this. With bad roads, long distances between supply depots and cities, in foreign countries where there were neither proper tools nor repair parts available for emergencies, it required a most dependable engine. Bred from a line of heavy-duty industrial engines that have a twenty-year heritage of unfailing performance, the success of this train was to be expected. But this same kind of reliability will be found in the Waukesha line of heavy-duty bus and truck engines which are now available in a wide range of powers of both six and four-cylinder types.

A-818-LC

AUTOMOTIVE EQUIPMENT DIVISION

WAUKESHA MOTOR COMPANY

Waukesha Wisconsin

Eastern Sales Offices — *Eight W. 40th Street* — *New York City*

Exclusive Builders of Heavy Duty Automotive Type Engines for Over Twenty Years

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ELECTRIC RAILWAY JOURNAL

McGraw-Hill Publishing Company, Inc. APRIL 14, 1928 Twenty Cents Per Copy

Stringing Anaconda Copper Cable over the summit of the Cascades. Over 350,000 lbs. of Anaconda Wire are required in the electrification of the Cascade division of the Great Northern Railway.

ANACONDA WIRE PRODUCTS

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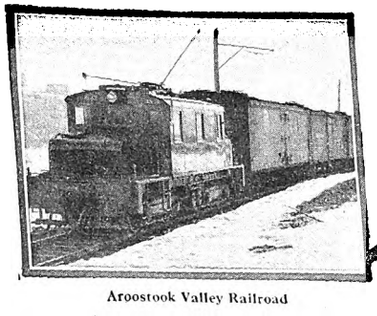
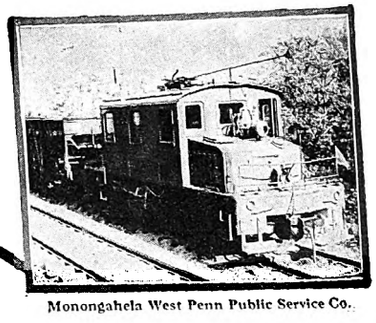
Local Freight Haulage

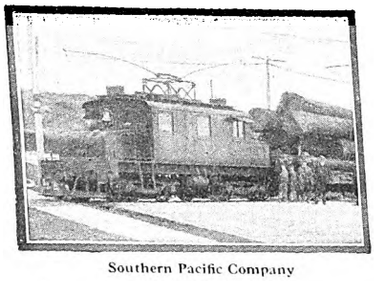
Increases Profits on Many Electric Lines



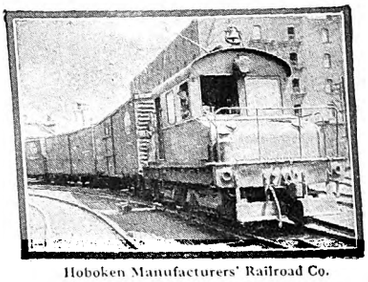
Aroostook Valley Railroad



Monongahela West Penn Public Service Co.



Southern Pacific Company



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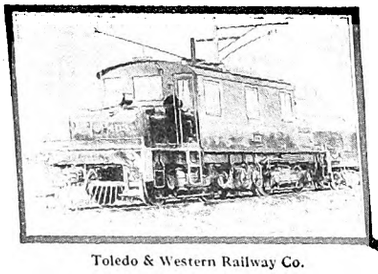
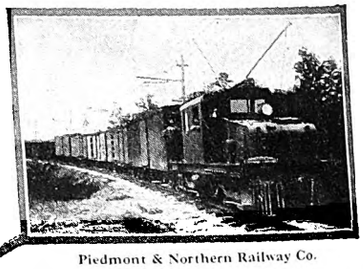


Toledo & Western Railway Co.



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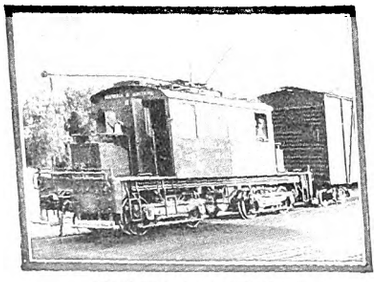

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Electric Railway Journal

McGraw-Hill Publishing Co., Inc.
JAMES H. MCGRAW, *President*

Consolidation of
Street Railway Journal and
Electric Railway Review

CHARLES GORDON
Editor

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Market Analysis an Important Part of Merchandising

WHILE discussions among electric railway men have for some time included the subject of merchandising transportation there still is a wide gap between the use of the term and its concrete application to the sale of transportation service. This is strikingly evidenced by the lack of definite information regarding the travel habits and preferences of the people in a given community.

In these days of keen competition and consequent need for intensive merchandising activity in the marketing of all classes of products, a market analysis has come to be recognized as one of the first essentials to scientific merchandising. The object of such a study is to acquire information regarding the number, location and buying habits of potential customers, and to determine the character of products and the nature of the appeals that may be expected to prove attractive to them.

Obviously, since this interest in the possibilities of merchandising transportation is of comparatively recent origin, "market analysis" is a strange term in the vocabulary of the electric railway industry. Nevertheless, it is highly important that transportation men understand the travel habits of those who do not use the street car or bus, so that they can study and learn the reasons why other modes of travel are being used and take steps to secure as much of this business as possible. Considerable interest, therefore, attaches to the survey of the riding habits of more than 100,000 persons in Detroit, made incident to the traffic survey in that city and discussed in the concluding article on this survey, published in this issue.

Questionnaires collected in eleven employment districts gave the place of employment, place of residence, mode of transportation used and reason, time required in traveling from home to work, and the number of blocks walked to and from mass transportation vehicles, if such were used. All of this information was classified for each of the eleven employment districts. It was classified, also, for 155 arbitrary residential sections and a chart was prepared showing how many of the total number tallied lived in each section, and the number using each type of transportation.

The charts prepared from the survey give a wealth of merchandising information. They show wide variations in the travel habits of the people in the several districts and illustrate the kind of market data that is needed to work out a really comprehensive transportation merchandising program. By using the information on the charts to check the actual transportation facilities provided, there is the opportunity for making service changes that will win increased patronage from those who for several reasons may be using other means of travel. The extent of this use of other agencies represents the "unsold" market for public transportation. In sections where automobiles are used extensively increased speed and more attractive equipment may be the appeal needed to win riders. Where walking is the chief competitor, reduced headways and special fare concessions for short distances may prove effective. In each instance there is the opportunity for adjusting service to the requirements of a given section. After that, local advertising or selling effort may be directed toward the prospective riders on each transportation line, rather than dissipated in general appeals to an entire community.

The Detroit survey was made to determine the general causes of traffic congestion, and this analysis of travel habits was incident to that general objective. There was apparently no thought of a transportation "market analysis" in the minds of those in charge of the survey. But the information obtained and the way in which it was compiled illustrate rather strikingly the opportunity which exists for public transportation companies to apply scientific marketing methods to the problem of merchandising transportation service.

Indeterminate Franchise Measure a Bright Spot in New York Legislation

GOVERNOR SMITH was right, in the main, when he said that the session of the New York Legislature which drew to a close recently was the least fruitful one he had witnessed in 25 years. Out of the ruck, however, there did emerge some railway measures that may have an important bearing, particularly on the situation in New York City. Among them are the so-called Thayer bills. These companion measures amend the transportation corporation law and the railroad law by providing for terminable permits for stage, omnibus and motor vehicle lines and for street surface railroads. Under them a municipality would have the right to acquire by purchase all or any part of the property, plant and equipment of a stage, omnibus, or motor vehicle line, or of a street railway. Subject to the approval of the Public Service Commission or the Transit Commission, cities are empowered to grant terminable permits to operate stage, omnibus or motor vehicle lines, or street railway lines.

The prediction was borne out that the bill designed to extend relief to railways in paying for paving would fail of passage. A law was passed, however, giving the city of Ogdensburg the right to compromise its paving claim with the Ogdensburg Street Railway. Despite the passage of the so-called Mastick bill, intended to confer upon the Port Authority the power to deal with a comprehensive surburban transit plan, the Governor vetoed that measure.

The bills intended to further the railway unification plan of the city of New York were lost. One of these measures was drafted at the behest of the Transit Commission, presumably as a part of its work in carrying

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out the Legislature's own mandate to it to prepare a plan for transit readjustment. The bill was iniquitous in that in reality it provided for a 5-cent fare perpetually, under the guise of authorizing the Board of Estimate and Apportionment of New York to appropriate funds and issue certificates of indebtedness to make up any deficit incurred.

Naturally, there has been some recrimination in New York City at the failure of the so-called city bills to pass. Samuel Untermyer, special counsel to the Transit Commission, deplores the failure of these measures, but Mayor Walker pretends not to be specially concerned about them since three or four more years must elapse before the system of rapid transit lines now under construction by the city and intended to be operated by the municipality will be ready to be put into service.

Apparently the Legislature was more alert than might at first be suspected, for, under the attractive bait of transit unification in New York, was poorly hidden another attempt to get rid of the fare requirement of the present law under which the city's municipal subway is being constructed. It will be remembered that the rate of fare on the municipal subway must after three years of operation be put at a figure sufficient to make the system self-supporting. A municipal system charging an 8 or 10-cent fare while privately operated companies are held to 5 cents, would have only one ultimate result—complete collapse of the city's untenable and ridiculous fare policy. Therefore the city administration made what appeared to be a somewhat casual effort to get rid of the requirement in the law which promises to become increasingly embarrassing as the municipal subway approaches completion. As long as the law remains as it is at present, continued effort may be expected to include the new municipal subway in some form of rapid transit consolidation. Any really sound plan must provide an adequate rate of fare. Since that is desirable from the standpoint of efficient transportation it is a good thing for the people of New York that the Legislature refused to "bite" on Mr. Untermyer's bait.

A New Bus Deal in Louisville

REAL co-ordination of the transportation services in Louisville is now assured. The Council has passed and the Louisville Railway has purchased a bus franchise that makes for co-operation not possible in the past. The grant is for twenty years. The provisions are published elsewhere in this issue. Like the railway franchise the new grant calls for the operation of the buses under the service-at-cost plan. This plan naturally possesses marked advantages where the matter of designating the amount and kind of service that are to be given is vested in the city.

The company at present has 30 buses available for use in a service which as now proposed contemplates the use of only 21 vehicles. It is to be expected, however, that this service will be augmented from time to time, particularly since Louisville has grown rapidly in recent years. Service somewhat similar to that now contemplated in the new grant has been given by the company in the past, but was largely the successor to that furnished by the original jitneys. The previous efforts of the company were hampered by the limitations under which it was permitted to function. It would appear now that all the previous handicaps have been removed. That, of course, is a good thing for the railway, but it is a particularly good thing for the city since it insures operation by a responsible public servant capable under the principle of co-ordination and service-at-cost of functioning under proper supervision to the best advantage of the public. In short, the city has enrolled its name along with those other progressive municipalities in the United States which have recognized that transportation, properly supervised by governmental agencies, is a natural monopoly.

The Bus Is Finding Its Economic Place

APPLICATION of the Kansas City Public Service Company for a 15-cent bus fare raises anew the question of the economic place of the bus in city service. That there is a place—and a large one—for the automotive vehicle is today beyond question. But that place stands out with increasing clearness as one in which there must be an entirely different conception of service standards and rates of fare than exist for street cars. The bus is dependent for its major development upon assuming its place as a transportation agency in its own right and not as a mere substitute for existing services.

The bus-rail problem by no means stands alone in the history of transportation. When the railroads began to throw their steel bands across valley and mountain, the river barge was doomed to oblivion in the minds of many. Nevertheless the lower Mississippi last year carried the largest freight tonnage in its history. When the automotive triumvirate—the automobile, the truck and the tractor—began to change the habits of a nation, old Dobbin seemed destined for the glue factory. Yet hay is still an important farm product and harness makers don't complain for lack of business. It is one of the characteristics of transportation that demand increases with increased facilities, speed, convenience and comfort.

At present there is a wide gap between the cost, the convenience and the attractiveness of an automobile, and a transportation ride in the basic low-priced agency—the street car. Between these two limits there is a broad field into which the bus fits due to its inherent advantages. By giving a service at rates varying from 4 to 5 cents a mile, it becomes possible to offer convenience, attractiveness and comfort in city service at a price which can compete favorably with the private car or taxicab and which at the same time offers an attractive margin of profit. As parking difficulties and traffic congestion become more acute, the attractiveness of such service by buses is increased.

All this is not to say that there is no place for the bus in service of the feeder or supplementary type at rates of fare approximating street car rates, where the density of traffic does not justify the investment in rails. Under such conditions the rubber-tired vehicle offers an excellent expedient for reducing the losses that would be entailed in giving car service. But as experience with the bus increases it becomes clear that it is a mistake to establish bus operation on a large scale at rates which do not permit it to render the preferred class of service for which it is inherently fitted. Farsighted bus manufacturers today are devoting their attention to the economics of bus operation in a way which promises rapid expansion in the use of the new vehicle. They are concentrating upon the application of their vehicles in services

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which will prove really profitable to the operator. In that objective they still encounter the competition of the salesman who has not yet learned that low fares, once established, are difficult to raise and that an unprofitable operation does not produce repeat customers.

The Kansas City move for a 15-cent fare directs attention again to the Pittsburgh operations in which a preferred form of transportation with buses was initially established at 25 cents and has since been expanded rapidly and profitably. The character of service offered attracts a very considerable number of riders who formerly operated their private cars regularly. The secret of the success achieved seems to lie in the fact that the character of the operation and the rate of fare charged have been properly balanced to give a service which is really attractive and self-supporting.

Saving Money by Spending It

SEVERAL interesting features are involved in the recently opened carhouse and storage yard of the Detroit Department of Street Railways on Coolidge Highway. According to an article elsewhere in this issue, the management estimates that savings approximating $500,000 a year will be effected. That is a large sum, even for a system the size of Detroit's. An analysis of the reasons for it is of interest.

The major part of the saving comes from a reassignment of the cars of the Grand River Avenue line. Since the Jefferson Avenue cars have been running express the former through-routing of the two lines has been discontinued. It is estimated that assignment of the Grand River Avenue cars to the new station will effect a saving of $225,000 annually through the elimination of waste car-miles. Other savings come from the arrangement of the storage tracks so that rotary movement of all cars can be obtained, reducing waste time for backing the cars out, and through the use of a portion of the property for storage of track and paving materials for distribution to locations on the west side of the city as needed.

One of the noteworthy items in connection with the selection of the site is that there has been an increase in realty values in the neighborhood. Years ago the erection of a carhouse depreciated the adjacent property materially. One reason for the difference here is that the railway management has followed the plan adopted by many theaters, hotels, and other business concerns which need entrances only on the main thoroughfare. The space reserved for the railway has only sufficient street frontage to provide entrances for the cars and space for the inspection building. The remainder of the property used for open storage of cars is at some distance back from the street, leaving the portion in front vacant. The department plans to resell a frontage of 663 ft. along Coolidge Highway, and it believes that the amount that can be realized will be nearly equivalent to that paid for the entire plot.

By attention to the details it thus has been possible to plan new facilities so that they do not add anything to the cost of the property. If the savings estimated are realized, the entire cost of land and building will be returned in less than one year. It takes relatively few projects such as this to spell the difference between success and failure in these days when the margin of profit is small.

Exaggerated Optimism May Disturb Business Stability

FUNDAMENTALLY, business conditions are sound. But the present industrial world has undergone a readjustment in recent years the portent of which is disconcerting in its magnitude. In an article on page 602 of last week's issue of the JOURNAL, Julius Klein, director of the Bureau of Foreign and Domestic Commerce, cites the fact that the mechanization of industry and war deflation has reduced the number of factory employees in the United States 917,000 since 1920. Added to this are decreases of 800,000 employees in agriculture and 240,000 on the railroads, making a total of approximately 2,000,000.

This trend has been quite apparent and has been widely discussed for several years. Not so widely recognized, however, has been the balancing effect of the rapid increases in non-manufacturing or service occupations cited by Dr. Klein. Automobile distribution and service, insurance, domestic appliances, education, motion pictures, barbers, hotels and restaurants have shown large increases in number of employees engaged. Thus the increased standard of living that has resulted from productive efficiency seems to be producing in considerable measure the demand for labor needed to balance the replacement of factory employees.

As Dr. Klein points out further, the first and indispensable safeguard of prosperity is to minimize waste, to concentrate every possible individual exertion toward widening the present rather narrow margin of profit by cutting in on production cost on the one hand and the expenses of distribution on the other. This advice is particularly significant since at this time the margin of profit in nearly every line of business shows unmistakable signs of growing narrower.

Closely related to business, of course, is the security market. There is always danger when the income return from stock investments crosses on its downward path the curve of the return from bonds. That point was reached long since. As that conservative commentator the *Financial Chronicle* says, prices on the Stock Exchange are being boosted with a rapidity and daring that is perfectly dazzling. Eventually securities must reach a level more nearly in line with their intrinsic worth, and that intrinsic worth is inexorably fixed by earning power. If the inevitable deflation of security prices is orderly, there may be no very grave consequences, but if the downward trend that follows is subject to anything like the violent gyrations of the upward movement, the consequences may be far reaching in their general effect.

Apparently, the country has been able to absorb some very heavy shocks. It would seem on the surface that there has been no other consequence than the rocking of the boat as a result of the Florida hurricane, the Mississippi Valley flood, the Ford suspension and the Presidential year unsettlements, but that is by no means certain. Again let it be said that business is sound, but it will remain so only as the responsible men in industry bend every effort to keep it so. And that presumes that they shall do everything within their power to discourage exaggerated optimism. Unbridled speculation in securities is a threat to stability. Wall Street is no less subject to abuse as a market than are other markets. It is in the abuse of the security market that the most immediate danger to industry seems to lie at this moment. Business prosperity is not helped by the hysteria of the gambler.

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Modern Equipment Used for
Instructing Toronto's Trainmen

This school has been provided to make the work of preparing new men for their duties easy. Old employees also attend the school and learn methods for doing their work better

By W. R. McRae
Superintendent of Rolling Stock and Shops
Toronto Transportation Commission, Toronto, Canada

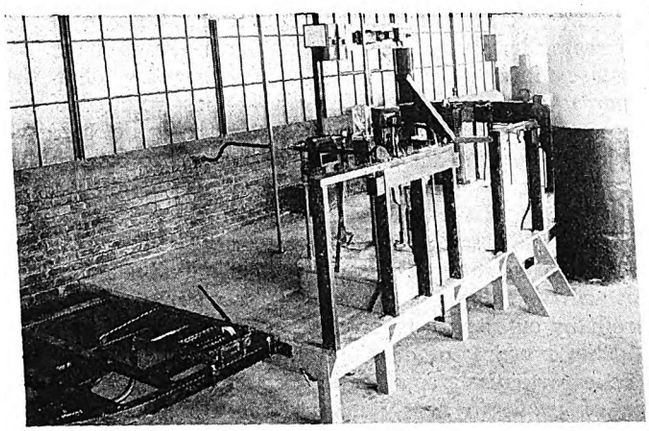

Fig. 1—Platform showing standard car equipment

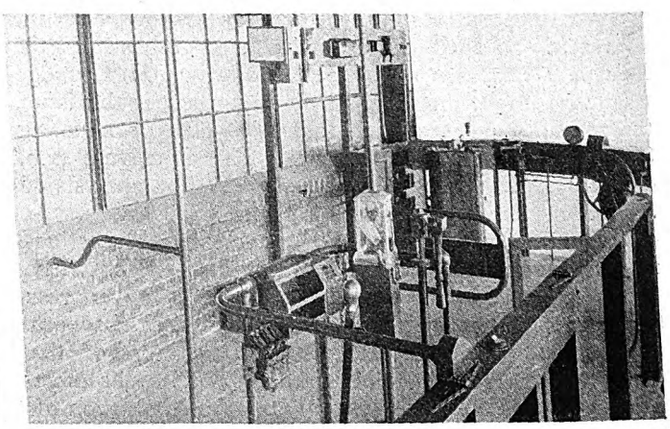

Fig. 2—Near view of equipment shown in Fig. 1

WHEN the city of Toronto took over the street railway from the Toronto Railway in 1921, and put responsibility of operation upon the Toronto Transportation Commission, the building used for the activities of the school of instruction was found unsuitable in many ways, and this important section, which has such a huge bearing on the success or failure of street railway operation, has for some time been located in suitable quarters.

The new premises, situated adjacent to the Hillcrest shops, which are centrally located, are thus convenient of access to employees from all carhouses.

In addition to the standard training of new platform employees the school of instruction is extending its usefulness to all employees, regardless of length of service or department.

Platform men of 20 or 30 years standing are making voluntary visits with a view to learning all they can of the equipment in use and a desire to clear up doubts regarding certain points. To date more than 60 per cent of the platform men (about 1,200) have visited the school of instruction, heard the lecture, and have had demonstrated to them the various pieces of equipment with which their work brings them in contact.

The benefits to be derived from a visit to the school appeal not only to platform men. Shed employees have attended in good numbers, and the clerical staff which deals with the correspondence, accidents, equipment, reports, etc., has also attended lectures and gained knowledge which enables it to carry out duties more efficiently.

The school of instruction is in charge of Chief Instructor Grant, who is assisted by six instructors. A better understanding of the school may be obtained by reference to the illustrations, which show the equipment in considerable detail. The following paragraphs give a brief explanation of this apparatus:

An important piece of equipment is a raised platform, Fig. 1 and Fig. 2, at one end of which is mounted in relative position the equipment as in the vestibule of a standard Peter Witt car. Near the middle is located a conductor's stand as in a three-door trailer. This layout was chosen because in addition to having the usual equipment of farebox, change counter, door control levers, signal lights, etc., it also has the movable barrier which permits of using the middle door as either entrance or exit. This unit is not a "live" one, but is used to familiarize the student with the appearance and location of the various pieces of the equipment. It also teaches him the purely mechanical movements necessary in handling the controller, motorman's brake valve, etc. The movable barriers used to represent doors are provided with switches in circuit with the control switch and motorman's signal lights so that the door interlocking features may be demonstrated. A supply of compressed air permits gage indications to be shown.

At the rear end of this platform, Fig. 3, is a struc-

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ture on which is mounted a Tomlinson coupler, with a drum switch and air cocks. A second Tomlinson coupler makes it possible to demonstrate how the cars, air lines and electrical circuits are connected and disconnected.

Those cars not equipped for train operation are not fitted with Tomlinson couplers, an adapter being used in order to couple the standard Victor drawbar to the Tomlinson coupler. The Victor drawbar head and the adapter are shown in the foreground of Fig. 3. Their use is illustrated in Fig. 4.

Figs. 5 and 6 show the side and end views respectively of a platform upon which is mounted a complete equipment of safety devices, including a treadle-operated exit door. The controller, motorman's valve, etc., are arranged so that the operator faces the equipment and can see the action of the brake cylinder, line switch, treadle door and sanders. For this last a board is provided with a pointer showing sand "on" and "off."

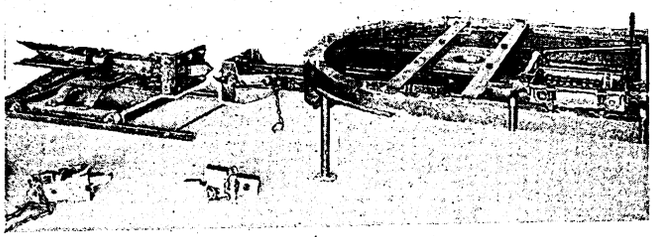

Fig. 3—Demonstration equipment for coupling cars

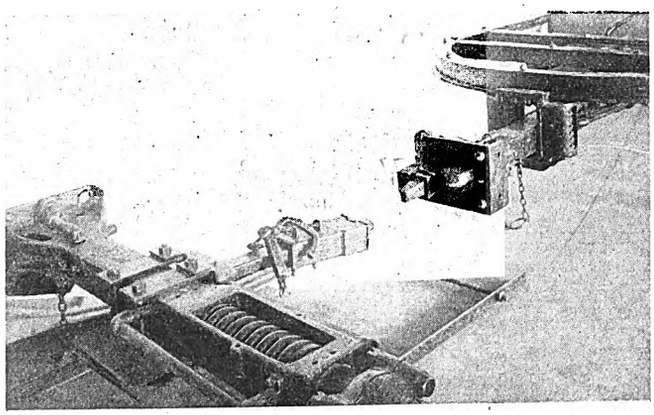

Fig. 4—Use of adapter for connecting automatic and non-automatic couplers

A white lamp, located at the line switch, lights when the switch closes, and a red lamp at the brake cylinder lights when the piston moves out. Both lamps are in line with the operator's eye and serve to impress upon him that when an emergency application of the brake is made from the controller handle, the power is cut off and the brakes applied as well.

Midway on this platform is a unit representing a section of the side of a car with which is mounted a Peter Smith hot air heater with the intake exposed, and a short section of air duct showing how fresh air is drawn from outside and circulated through the car after heating. A standard ventilator is fitted to the roof section and appropriate notices give details of the amount of fresh air handled by each.

One of the simplest but most useful pieces of equipment of the school is shown in Fig. 7. This is a board on which are painted some simple circuits. The upper diagram of the control circuit through the door interlock

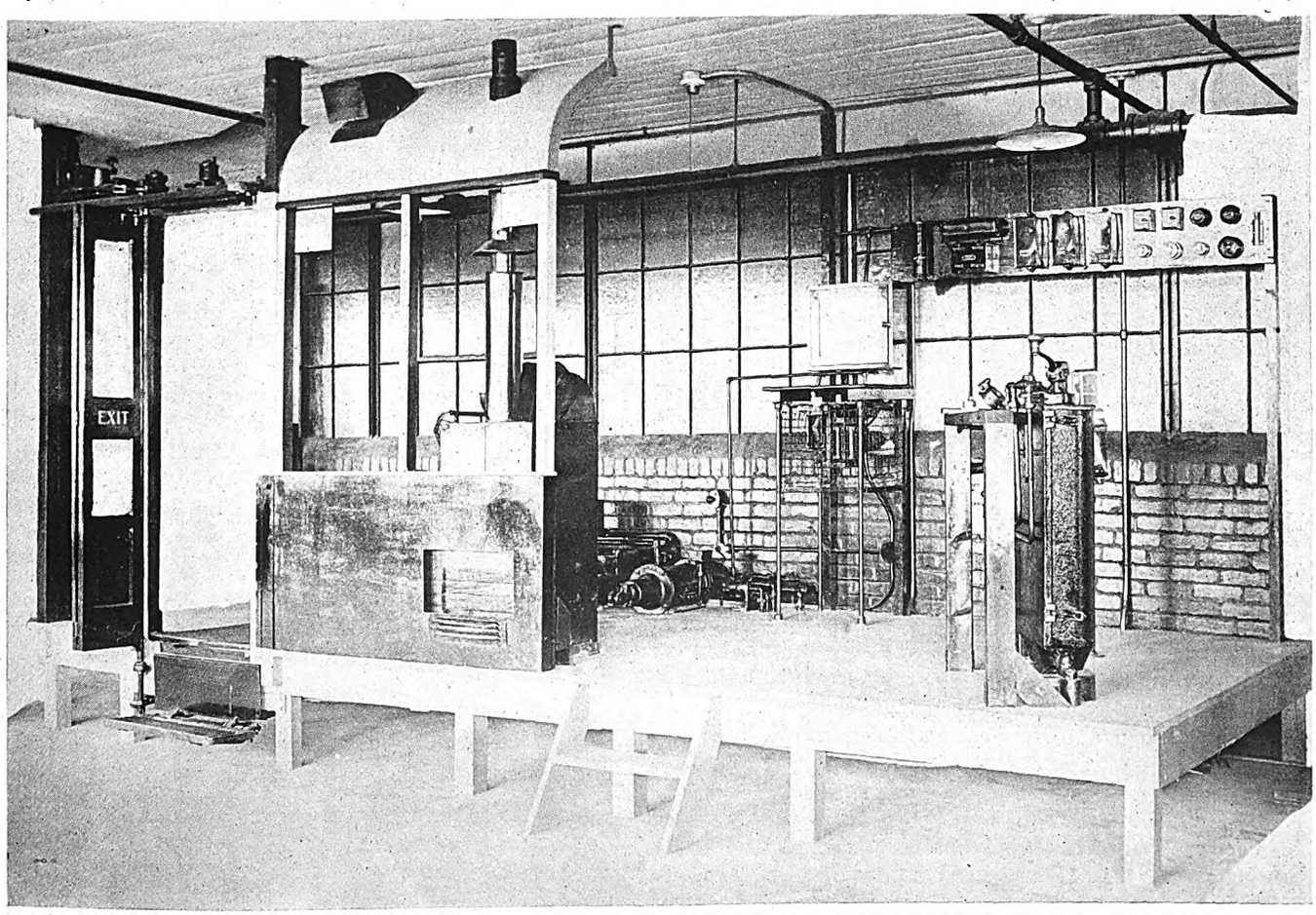

Fig. 5—Platform equipped with full set of safety devices

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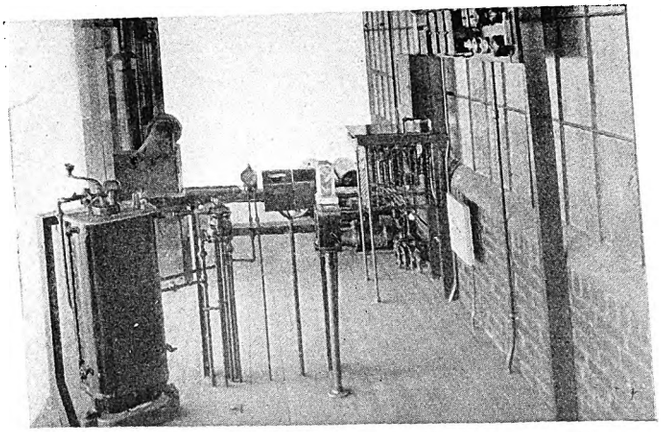

Fig. 6—End view of the safety device exhibit shown in Fig. 5

switches, etc., illustrates clearly by means of a small wooden bar, which represents the blade of the emergency switch, how, in the event of a failure, the coupler, door switches, etc., can be cut out and a separate feed from trolley secured in order to keep the car moving. The two lower diagrams to the left show the series-parallel arrangement of the motors, and by means of movable dummy switches the action when the controller cutout switches are used is illustrated. At the lower right-hand side is a standard diagram of the various car circuits.

Fig. 8 shows the demonstration board on which the more common failures of the electrical equipment are illustrated, with instructions as to the proper steps to take to get the car moving. On this board are mounted four electric fans and four small lamps, representing the armatures and fields, respectively, of four motors. A number of lamps to represent the rheostat and a line switch are also installed. The board is appropriately painted to show the conduits and wiring to the motors and rheostat; the whole is regulated by a K-6 controller, together with the necessary control switch fuses, etc. Concealed snap switches are mounted behind the board

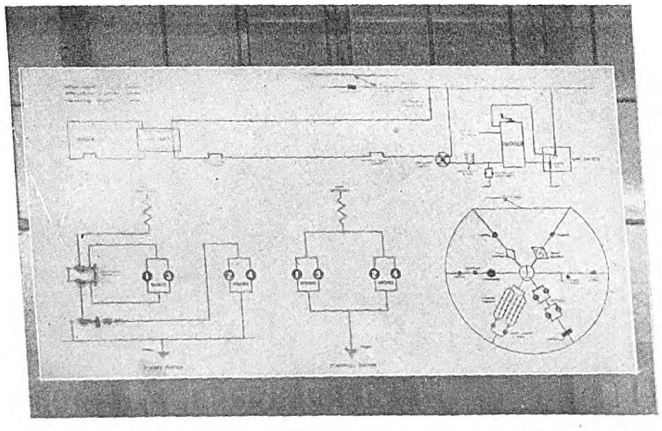

Fig. 7—Simple circuits of motors and equipment of a modern car

with the stems projecting through to the front. Small pointers fastened to these stems under the buttons are painted in uniformity with the lines representing the wires.

The student comes to this board from the one previously described, and is, therefore, familiar with the series-parallel arrangement of the motors. Here he is shown normal operation first. After closing the control switch and getting signal lights, the controller is put on the first notch and the line switch is seen to close. The whole rheostat is shown in circuit, and the four motors start slowly. In a similar way all the steps to the full parallel position are illustrated.

For demonstrating defects, two of the concealed switches are used to illustrate open motor leads. Two show grounded motors, two more show defects in the rheostats—one a ground, the other a broken grid. Open leads are demonstrated by turning the switch pointer through 90 deg. showing a break in the painted line representing the wire. As the controller is notched up

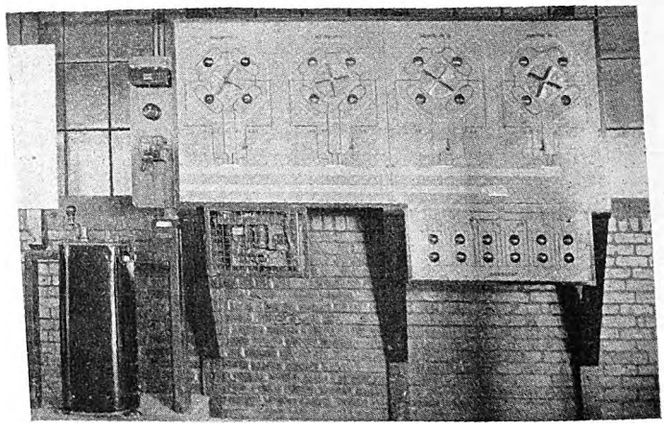

Fig. 8—Demonstration of common failures of electrical car equipment

the second motor of the pair with a broken lead is seen to spin very fast, while the other two motors run comparatively slowly.

Grounds are illustrated by turning the pointer to register with a ground wire painted on the board, and the student is instructed that the current, instead of following its normal path through the motor, takes the easier path to ground through the defective insulation at the point illustrated. Two concealed snap switches behind the switchboard to the left, for the instructor's use, illustrate how the line switch will open when a ground has occurred, one for the series notches and the other for the parallel. For example, with a ground in No. 1 motor, the instructor turns the first concealed switch as well as the pointer illustrating the ground. On turning the controller handle the line switch closes and the rheostat is shown alive, but due to the ground there is no movement of the motors. Advancing the K-6 controller to third position results in the line switch opening. The student is then shown how to cut out the defective motor.

The armature shown in Fig. 9 is used to let the student see what damage may result from improper handling of

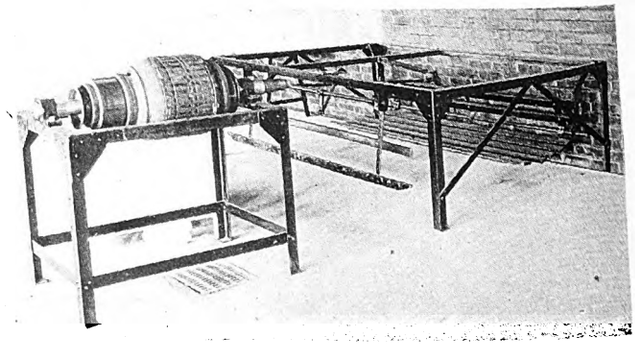

Fig. 9—Armature used to illustrate damage from improper handling. In the rear is a complete lifeguard

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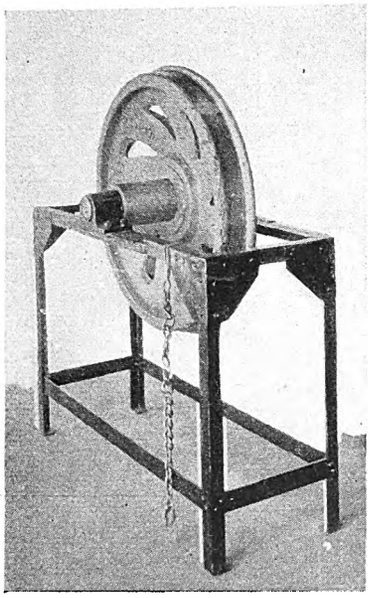

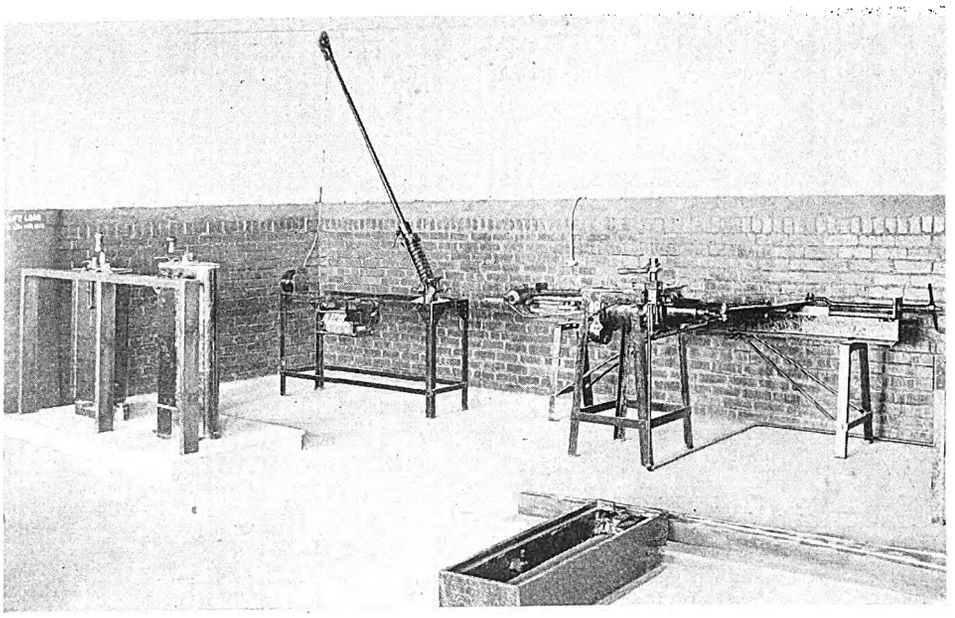

Fig. 10 (at left)—A flat wheel is shown, together with a chain removed from the track groove. Fig. 11 (at right)—Models of an electric track switch, various controllers, trolley pole, catcher, fuse box and rheostat

the car or failure to cut out a defective motor. The instructor adds a few words relative to the expenses incurred and loss of revenue incidental to failures of this kind. An H-B lifeguard is also seen in this view. It is mounted so that all parts are clearly visible and its working can be explained easily.

A cast-iron wheel with a flat spot is shown in Fig. 10. The instructor remarks on the cost of flat wheels and their prevention. The piece of chain hanging on the stand is a sample of the material which finds its way into the groove of the rail, doing a great deal of damage to wheel flanges if not removed promptly.

Of the four units shown in Fig. 11 one is a model of the electric track switch which is standard on this system and is used to demonstrate how in the event of the switch failing to work a link may be removed allowing the tongue to move independently of the actuating mechanism. This link in the model is painted red. Another is a stand on which are mounted a K-10 and an English Electric Company Q-2 controller. In the corner is a stand on which are mounted a trolley pole and base with rope and catcher, a trolley fuse box and a section of rheostat. The last is a set-up to which a supply of air is connected, which is used to demonstrate the working of the automatic brake slack adjuster. A white mark painted on the piston sleeve indicates standard piston travel. Then some slack is introduced in the system and the action of the adjuster noted.

Fig. 12 shows the seating plan in the class room. In this room are the standard schedule and notice cases and a section of a "signing in" desk, all as used in the various carhouses of the system. On the walls are frames containing sample transfers, badges, etc., together with a large map of the city.

Fig. 12—Seating arrangement in the class room

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Purchase of Tientsin, China, Street Railway a Problem

Chihli state government, while contemplating the purchase of the system, objects to the railway company's sale price

By H. O. Kung
Secretary the Chinese Engineering Society American Section

PURCHASE of the street railway system in the city of Tientsin, the "Chicago" of China, is proving a difficult problem for the Chihli state government. The present company operating the street railway system demands a price fifteen times the average annual profit of the three preceding years, which the government is unwilling to pay.

The provisions of the franchise concerning distribution of profits and the purchase of the system by the government are peculiar. The purchase terms involve the profit earned by the company, and the profit to be retained by the operators, in turn, is determined by investment. Since the owners have never disclosed the true investment figures, the government officials are unable to arrive at a correct purchase price. The whole problem has now resolved itself into evaluating the street railway properties.

The city of Tientsin, the great trade center of north China, is about 80 miles southeast of Peking, the capital of the Chinese Republic. A few generations ago Tientsin was a very small town, but now it has a population of more than 900,000. Of this number 1 per cent are foreigners, most of whom are engaged in trading, either importing or exporting. All the street construction and trade buildings are modern, except those within the former city walls. Tientsin resembles in many respects the American cities of Cincinnati, Ohio, and Pittsburgh, Pa.

Franchise Outlines Detailed Method of Distributing Profits

The street railway was constructed in 1904 by a Belgian trade company, which also installed the power and light distribution system for the city. The nominal capital has been given as $1,000,000, but the actual investment of the company is unknown to the state government officials. The company paid $5,500 to the Chihli government for the issue of a franchise for a period of 50 years. A detailed system of distributing profits was outlined in the franchise tendered the railway, as follows: The company shall contribute each year to the Chihli government a sum which shall be 3½ per cent of the gross revenue and may earn a legal profit of 12 per cent on the investment. If any profit should remain after deducting for expenses and maintenance, 12 per cent of the amount shall be contributed to the government as royalty. Dividends on the stock may then be paid up to 15 per cent of par. Should any balance remain undivided after paying the 15 per cent dividends, 20 per cent of this remainder shall be paid the government and 20 per cent retained by the company as surplus.

According to the general contract, the Chihli government may purchase the properties of the operating company after the first twenty years of service at a price which shall be fifteen times the average annual profit of the three immediately preceding years. In no case shall the price be less than all the expenses for construction and installation of the entire system, including buildings, trolleys, tracks, machinery and equipment. Should the Chihli government not purchase the properties of the operating company at the end of the first twenty years, a seven-year extension service shall be allowed to the same company. After 50 years of service, however, all the property shall be transferred to the government free of charge and in good condition.

It is obvious that the operating company would hold a decided advantage should the Chihli government decide to purchase the road at the end of the 49-year period. However, should the government await the termination of the 50-year period, the tables would be turned. The general contract was signed on April 26, 1904, and the franchise for furnishing electric energy and street car services will be legally terminated in 1954. The seventh elapsed period would terminate in 1953.

GROSS REVENUE, EXPENSES AND PROFIT FOR 1922, 1923 AND 1924

Year	Gross Revenue: Street Railway	Gross Revenue: Lighting	Gross Revenue: Total	Expenses	Profit
1922	$845,529	$1,387,519	$2,233,048	$775,399	$1,457,649
1923	854,075	1,586,397	2,440,472	749,974	1,690,468
1924	872,308	1,766,176	2,638,484	784,325	1,854,159

The financial conditions of the operating company for a few years past are extremely interesting. The gross revenue, expenses and profits for the year 1922, 1923 and 1924 are shown in an accompanying table. The average annual profit for this period was $1,667,435, so that the purchase price, figured according to the terms of the contract, would be $25,011,525. It is quite natural that there should be disagreement between the company and the government over the "fifteen times yearly profit" clause.

The general contract provides that the Chihli government may acquire control of the company's property if it can be found that the company has earned any illegal compensation. As a result of several months investigation conducted by a special committee, the operating company has been found to have earned illegal profits. On the basis of this discovery, the government assumed control of the property in August, 1927, and demanded a purchase price to be set by the company. The company complied with the request and in a note sent to the government claimed $26,305,395 as the purchase price of the entire property. This amount the government has refused to pay. Because the purchase price is determined from the average annual profits over a three-year period, and since the amount of profit to be retained by the company is determined by the actual investment in the property, there has been a further dispute over the actual amount invested in the property. The government has set about to determine a reasonable valuation from which it can establish a true purchase price.

To arrive at such a reasonable valuation the following three elements should be considered and given their proper relative weight in determining the final price: First, the actual and historical investment of the company should be disclosed to the appraisal engineers; second, the market value and the amount of the outstanding stocks and bonds also should be disclosed; third, a brief but complete financial statement of the company for each year, from the first year of operation to the present, should be presented. Based upon these three elements in applying the equal profit ratio depreciation method a just valuation of the company's properties may be determined.

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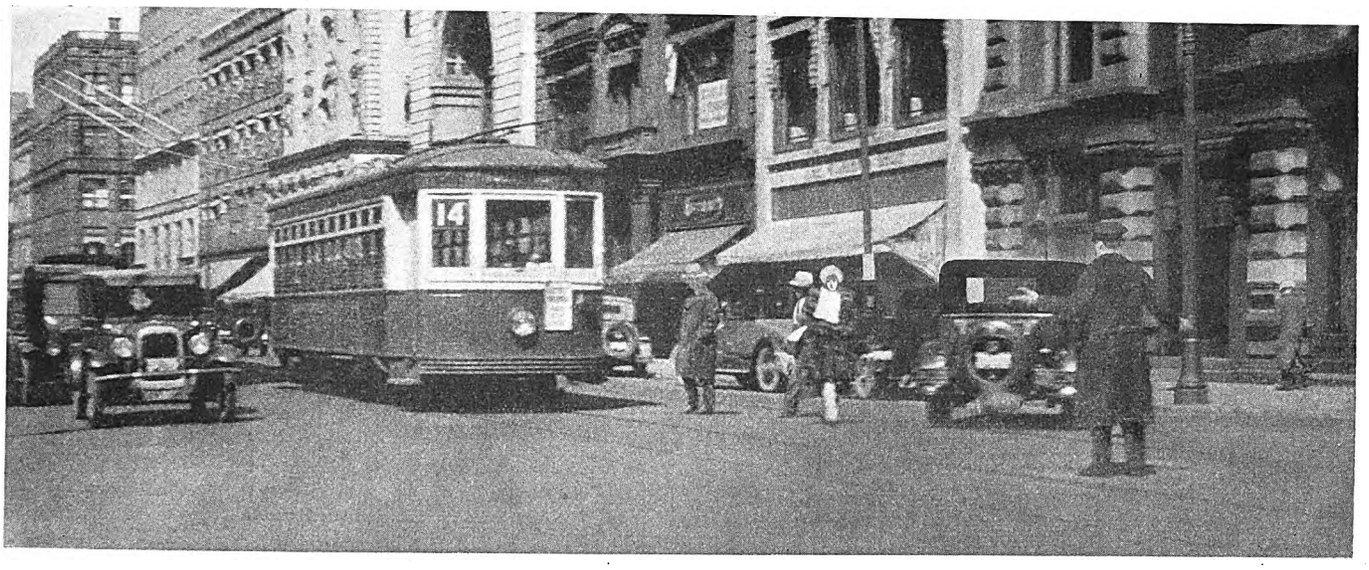

One of the 50 light-weight city cars bought by the Springfield Street Railway last year

Million Dollar Rehabilitation

at Springfield

Purchase of new cars and new buses, extensive track reconstruction, and increase in shop and garage facilities are among the improvements made during the past year. Further track reconstruction planned for coming season

MORE than a million dollars was spent by the Springfield Street Railway, Springfield, Mass., in the improvement and rehabilitation of its property during 1927. This was one of the first big steps in the plan of the New York, New Haven & Hartford Railroad to modernize the street railways which it controls. The rehabilitation was not undertaken from altruistic motives, but for fundamental economic reasons. Investigation convinced the management of the New Haven that the street railway is now, and will remain for a long while to come, the backbone of the local transportation service in Springfield. The officials of the railroad believe that transportation, like any other commodity, cannot be produced economically with obsolete equipment. Furthermore, it is their belief that transportation service should be made attractive. You cannot sell a man what he does not want. With these thoughts in mind, an extensive program of improvements was undertaken. Some of them have already been carried out, and others will be made during the present year.

Approximately $800,000 was spent last year for 50 new light-weight city cars. Before the purchase of these cars the company had been engaged in the development of an experimental car in collaboration with the Wason Manufacturing Company. This experiment was one of the outstanding developments in the electric railway industry last year. So many radical features were included in this new design, however, that it was considered undesirable to adopt it for a large order of cars before these new departures had been thoroughly tried out in actual service. The lot of 50 cars bought last year, therefore, were designed along more conventional lines. They were described in detail in ELECTRIC RAILWAY JOURNAL for March 26, 1927.

The company also bought nine new buses last year. Of these three were 29-passenger Yellow coaches model Z. Six were Macks of the same seating capacity. All the new buses are being used on city routes in Springfield, taking the places of older buses which have been transferred to lighter traffic routes in outlying districts. In all, the Springfield Street Railway is now operating 41 motor coaches. The former freight station has been converted into a garage. Owing to the discontinuance of through electric railway operation between Worcester and Springfield, freight service had been abandoned and the former freight station became available for other uses.

More than $300,000 was spent for track improvement last year. The program was planned after a careful survey of the property had been made to determine what resconstruction work was needed. On account of increasing traffic and to speed up the service a considerable amount of double-tracking was undertaken. In all 1.78 miles of new track was added to the system and 6.07

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SUMMARY OF TRACK WORK DONE

Job No.	Location	Work Done	Distance Ft.	Date Built	Old Construction: Rail	Ballast	Paving
1	Belmont Ave., X to E. Longmeadow line	Replacing single track with double track	5,000	1896–1901	7-in., 70-lb. T	None	Bituminous macadam
2	Sumner Ave., Lenox St. to Lyndale St. Double-track crossing at X.	Replacing single track with double track D.T. crossing, two branch-offs, three cross-overs.	2,500	1896–1901	7-in., 70-lb. T	None	Bituminous macadam
3	State Street, Oak to Hancock	Reconstruction of double track	1,200	1910	9-in., 125-lb. girder	Sand on 6-in. con.	Wood block
4	State Street, Benton to Pine Point	Reconstruction and raising grade of double track 3 in.	4,200	1902	9-in., 107-lb. girder	Dirt	Hassam
5	Berkshire Street, West from Page Blvd.	Reconstruction of outbound track	2,700	1902	7-in., 70-lb. T	Gravel	Water-bound macadam
6	Berkshire Street, Page to Holly	Reconstruction of double track	2,700	1902	7-in., 70-lb. T	Gravel	Water-bound macadam
7	Main and Oak Streets, Indian Orchard	Installation of double-track branch-off	....	.....	.....	.....	.....
8	Memorial Square	Installation of single-track branch-off	.....	.....	.....	.....	.....
9	Main St. (W. Springfield) Park to Burford	Reconstruction of single track	3,024	1901	6-in., 60-lb. T	Gravel	Water-bound macadam
10	Chestnut and Carew, and Plainfield and West	Installation of two electric track switches	.....	.....	.....	.....	.....
11	Carew Street, Main to Chestnut	Reconstruction of single track	1,580	1894	6-in., 60-lb. T	.....	Macadam
12	Chestnut Street, Liberty to Linden	Reconstruction of single track, with branch-off to Liberty	1,350	1904	9-in., 107-lb. girder	Gravel	Granite block on sand
13	Woodlawn (West Springfield)	Reconstruction and relocation of track and overhead on state highway	4,000	.....	.....	.....	.....
		Double track extended	300	.....	.....	.....	.....
14	Maple Street (Agawam), O'Briens Corner to Bridge Street	Relocation of track	3,500	.....	.....	.....	.....
		Constructing new track	1,600	.....	.....	.....	.....

miles was rebuilt. Thus work was co-ordinated with the city's paving plans. Similar improvements will be made this year.

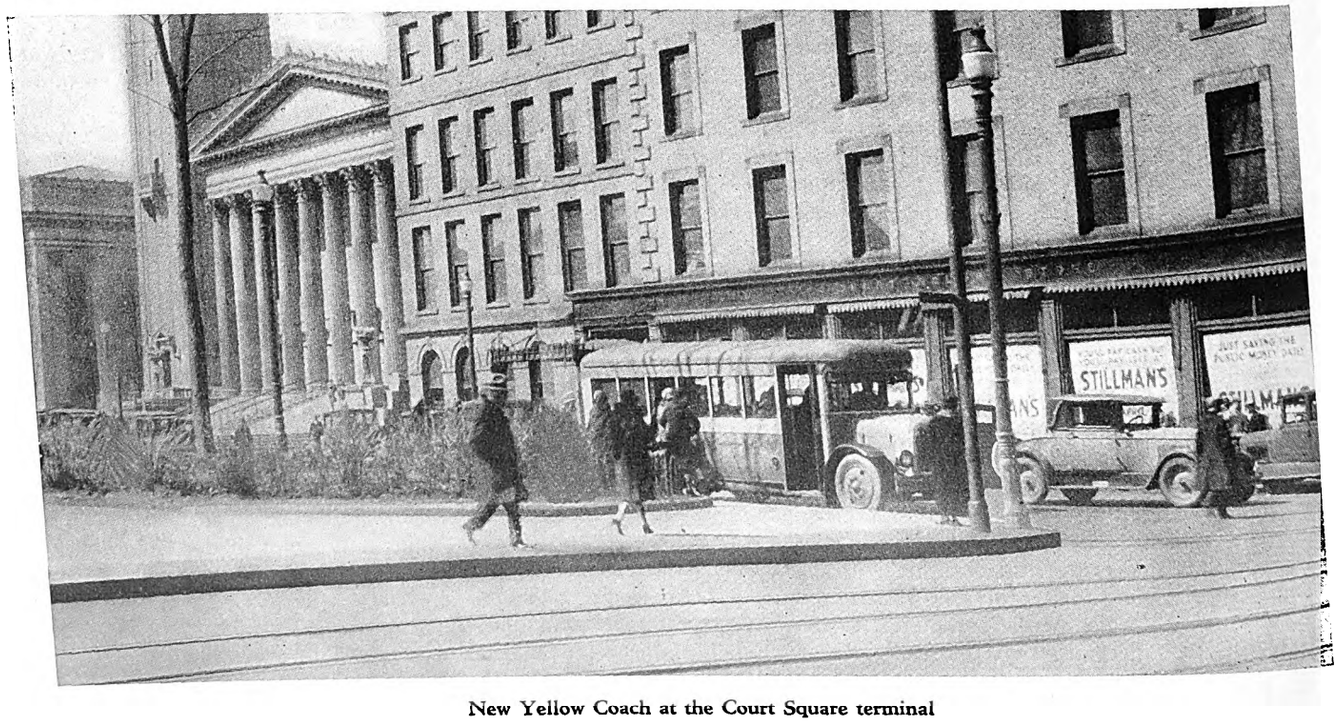
The work that was done covered nearly all lines in the system, as may be seen from the accompanying map. It comprised fourteen major jobs, which are indicated by numbers on this map and in the table which presents a summary of the work.

Reasons for Rebuilding

Single track on Belmont Avenue from the intersection of Sumner Avenue to the East Longmeadow line, a distance of about 5,000 ft., and on Sumner Avenue from Lenox Street to Lindale Street, about 2,500 ft., was replaced with double tracks. At the intersection a double-track crossing consisting of sixteen frogs, a single-track connecting branch-off, a single-track right-hand branch-off and three cross-overs were installed. On the map this work is indicated as jobs 1 and 2. The old 7-in., 70-lb. T-rail which was laid in 1896 and 1901, without ballast and in bituminous macadam, was removed. The new track replacing it was constructed with 7-in., 103-lb. girder rail installed on new ties on ballast of 6 in. of trap rock. The new paving consists of 3 in. of asphalt on 6 in. of concrete. The work cost $125,000 and took 63 working days to complete.

On State Street between Oak and Hancock Streets 1,200 ft. of double track was reconstructed. The old construction used 9-in., 125-lb. girder rail, which was installed in 1910 with sand ballast on a 6-in. slab of concrete. This was taken out and new 7-in., 103-lb. girder rail was put in. Here the sub-grade was not the same but trap-rock ballast was substituted for sand and a 6-in. concrete base was installed for the new asphalt pavement. This piece of work cost $16,350 and was completed in fourteen working days.

Farther out on State Street, from Benton Street to Pine Point, the city repaved with asphalt, using the old cement-macadam paving as a base. It therefore became necessary to raise the company's tracks 3 in. for a distance of 4,200 ft. New 7-in., 103-lb. girder rail was laid on steel ties in concrete with a 6-in. concrete base for the asphalt pavement, replacing the old 9-in., 107-lb. girder rail which was installed in 1902 and was laid on dirt ballast. The time taken for this work was 37 working days and the cost was $61,400.



New Yellow Coach at the Court Square terminal

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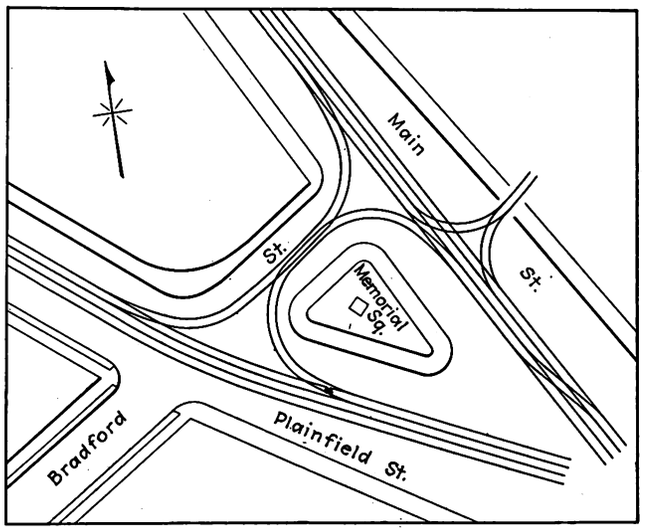
IN 1927 AT SPRINGFIELD, MASS.

New Construction			Working Days	Cost
Rail	Ballast	Paving		
7-in., 103-lb. girder	6-in. trap rock	3-in. asphalt on 6-in. concrete	63	$125,000
7-in., 103-lb. girder	6-in. trap rock	3-in. asphalt on 6-in. concrete	..	.....
7-in., 103-lb. girder	Trap rock	Asphalt on 6-in. concrete	14	16,350
7-in., 103-lb. girder	Steel ties in concrete	Asphalt on 6-in. concrete	37	61,400
6-in., 100-lb. T	6-in. trap rock	Asphalt on 6-in. trap rock	10	12,175
6-in., 100-lb. T	6-in. trap rock	Asphalt on 6-in. trap rock	21	30,000
.....	6-in. trap rock, rolled	3-in. asphalt on 6-in. concrete	..	6,300
.....	6-in. trap rock	3-in. asphalt on 6-in. concrete	21	7,000
7-in., 103-lb. girder	6-in. trap rock	3-in. asphalt on 6-in. concrete	13	18,000
.....	.....	.....	..	665
7-in., 103-lb. girder	6-in. trap rock	3-in. asphalt on 6-in. concrete	6	8,600
7-in., 103-lb. girder	6-in. trap rock	3-in. asphalt on 6-in. concrete	6	8,000
.....	.....	.....	..	8,200
.....	.....	.....	..	.....
.....	.....	.....	12	10,600
.....	.....	.....	..	.....
Total.....				$312,290

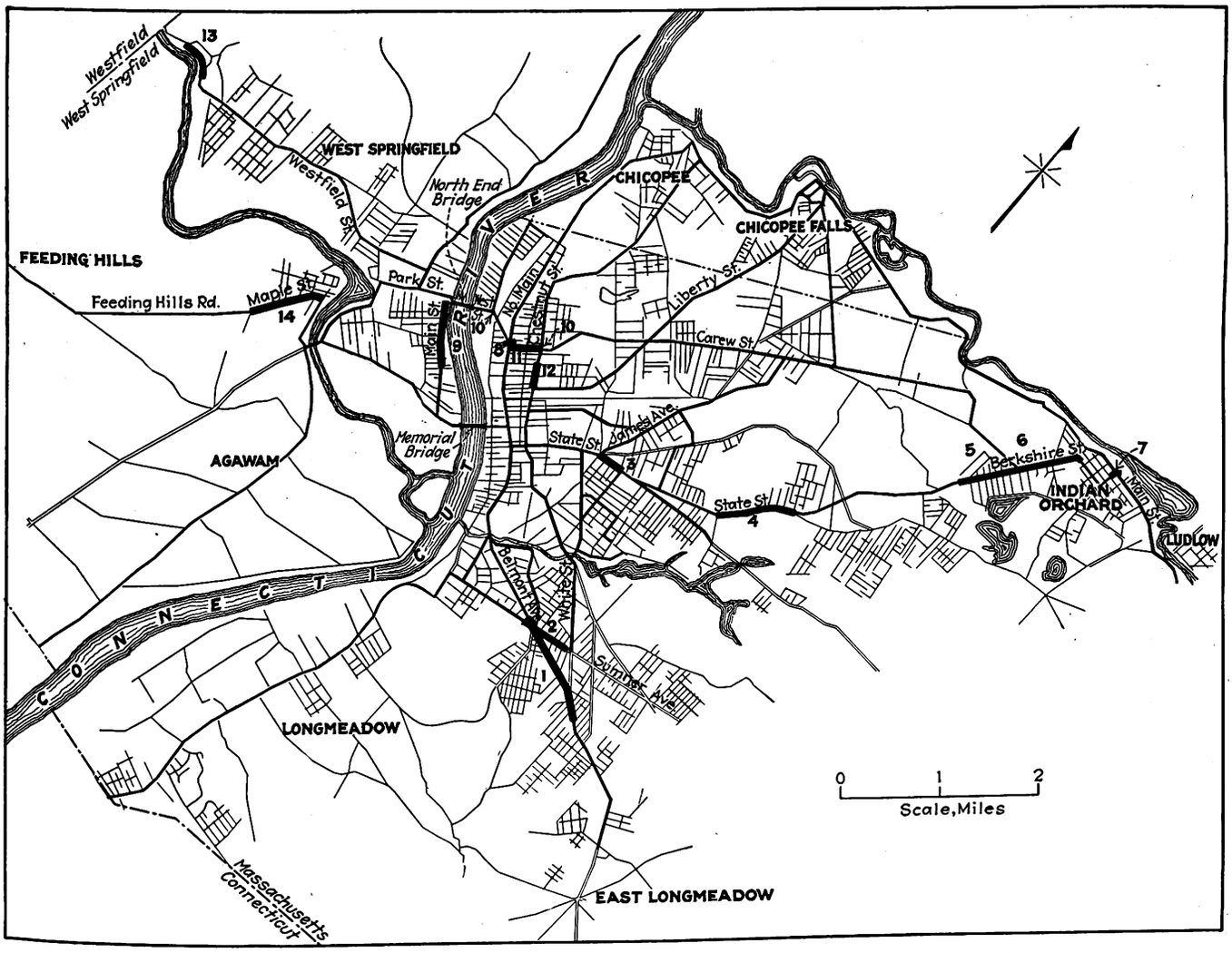


An unusual looping arrangement installed at Memorial Square

The outbound track on Berkshire Street, westward from Page Boulevard, 2,700 ft. long, was rebuilt. The old 7-in., 70-lb. T-rail which was taken out was installed in 1902 on gravel ballast, the paving consisting of water-bound macadam. The new track was laid with 6-in., 100-lb. T-rail on 6 in. of trap-rock ballast. This work cost $12,175 and took ten days.

Beyond Page Boulevard, as far as Holly Street, 2,700 ft. of double track on Berkshire Street was rebuilt with 6-in., 100-lb. T-rail, replacing the old 7-in., 70-lb. T-rail which was installed in 1902. The same method of construction was followed as on the job previously mentioned. This work took 21 days and cost $30,000.

The special work indicated on the map as job 7 is a double-track left-hand branch-off, installed at Main and Oak Streets, Indian Orchard. Trap-rock ballast rolled to a depth of 6 in., and a 6-in. concrete paving base with a 3-in. asphalt top dressing has been used. This work



Fourteen track reconstruction jobs were done in Springfield, Mass., last year at a cost of $312,290

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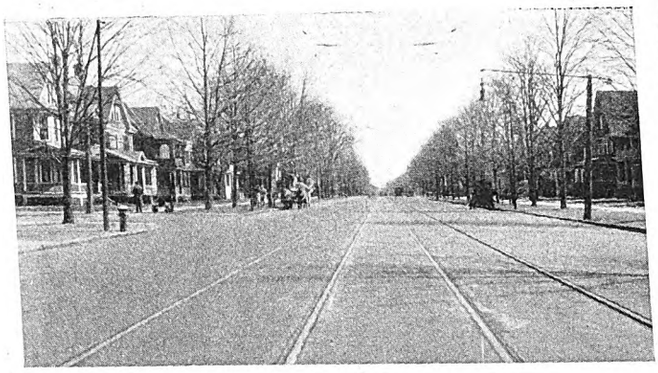
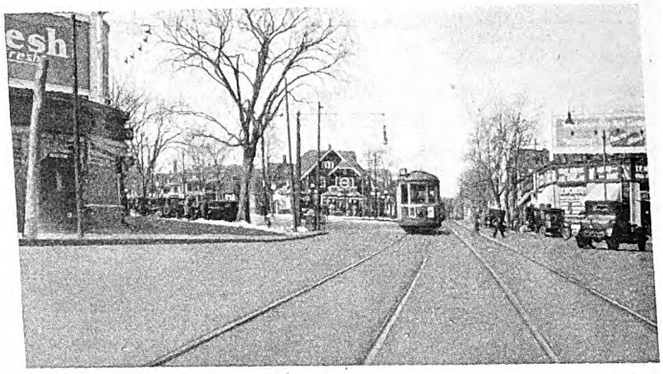


New double track on Sumner Avenue east of Belmont Avenue



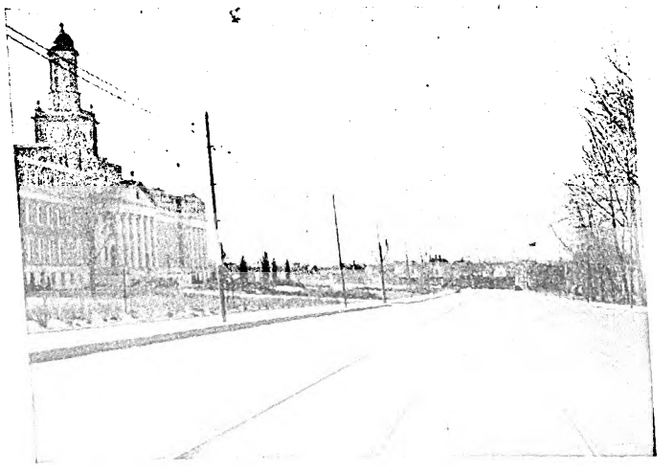
Double track installed on Belmont Avenue to speed up the service on a heavy traffic line

cost $6,300. An unusual installation made at Memorial Square is a single-track connected branch-off with gauntlet construction. Memorial Square is a terminal of several lines and this loop was installed to facilitate the turning of cars. The track was ballasted with 6 in. of trap rock and 3 in. of asphalt top dressing on a 6-in. concrete base. The work cost $7,000 and was completed in 21 working days. This is indicated as job 8. The single track on Main Street, West Springfield, from Park to Burford Avenue, 3,024 ft. long, was rebuilt. The original track consisted of 6-in., 60-lb. T-rail installed in 1901 with gravel ballast and water-bound macadam paving. This was replaced with 7-in., 103-lb. girder rail with 6-in. trap-rock ballast and a 6-in. concrete paving base. The job cost $18,000 and was done in thirteen working days. It is indicated as job 9 on the map.

At Chestnut and Carew Streets and at Plainfield and West Streets two electric switches were installed at a cost of $665. On Carew Street, from Main Street to Chestnut Street, 1,580 ft. of single track was rebuilt. The old 6-in. 60-lb. rail which was installed in 1894 was replaced by 7-in. 103-lb. girder rail. The old paving was macadam and the new rail was laid on 6-in. trap-rock ballast and 6-in. concrete base for the paving. Six working days were consumed in doing the work which cost $8,600.

Reconstruction of 1,350 ft. of single track on Chestnut Street, from Liberty Street to Linden Street, and also renewing right-hand branch-off into Liberty Street was done in six days at a cost of about $8,000. New 7-in. 103-lb. girder rail with 6-in. trap-rock ballast and 6-in. concrete base for paving was installed in place of the old 9-in. 107-lb. girder rail installed in 1904, gravel ballasted with granite block pavement on a sand base. On the Westfield-Springfield line on account of the relocation of the state highway about 4,000 ft. of single track was shifted and the double track extended a distance of 300 ft. The job cost $8,200.

Relocating 3,500 ft. of track on Maple Street, Agawam, from O'Brien's Corner to Bridge Street and constructing 1,600 ft. of track on Maple Street, from Bridge Street to Walnut Street, Agawam, on account of the construction of a new highway, took twelve days and cost $10,600. It shortened the distance of the Feeding Hills line 3,500 ft.



New track on State Street laid in comformity with the city's paving program

Cincinnati Finds Foremen's Conference Helpful

UNDER the leadership of E. J. Jonas, superintendent of equipment, foremen's conferences are being conducted monthly by the Cincinnati Street Railway for the heads of the mechanical department. These meetings are attended by the assistant superintendent of shops, the equipment engineer, the general foreman, and all shop and carhouse foremen. As a rule the day foremen get together in the morning while the night foremen meet on the evening of the same date. An occasional joint meeting is scheduled, at which the attendance is 30 or more.

The meetings are usually opened with a constructive talk by the chairman or a guest. At times a special subject—such as accidents, pull-ins, economy or supervision—is assigned in advance of the meeting. This gives the members an opportunity to come prepared to discuss such subjects fully. These constructive talks and discussions have proved to be well worth while.

Time is provided on the program for each member to bring out suggestions, problems and tests of various kinds on which he has been working. These are discussed, committees are appointed to make further investigation, or any other necessary action is taken. In this way each member gets to know what the others are doing and how they are going about it. Many subjects come up in this way that are of general benefit to the entire department.

Car-miles per pull-in increased about 61 per cent in the last four months of 1927 over the same period of the previous year. This upward trend is continuing, and the improvement is attributed largely to the effect of these meetings.

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Even though an automatic traffic signal is provided at this intersection pedestrians are using all crosswalks

Detroit Survey

Develops Basic Traffic Data

Commercial vehicles use only a few routes. Jaywalking and crossing against the red traffic lights are common practices. Extensive survey of travel habits shows wide variations in modes of transportation used

PART TWO

Unfavorable conditions existing in the alleys of Detroit, the parking situation, vehicular traffic flow and the movement of passenger transportation vehicles were covered in Part One, which appeared in the April 7 issue of this paper. The second and final article treats of commercial vehicle movements, regulation of pedestrians, the causes of accidents, a survey of travel habits, annd suggestions for traffic improvement submitted by citizens.—EDITOR.

FREIGHT vehicles, being slow moving, impede the general movement of traffic to a considerable extent. Traffic congestion has been laid at the doors of the freight vehicles, and it has even been suggested that horse-drawn vehicles be prohibited in some districts during certain times of the day. Valuable information on the use of freight vehicles was obtained from several wholesale and retail merchants. A total of 5,435 commercial vehicles were owned and rented by the merchants who replied to the questionnaires. Of these 1,308, or 24 per cent, were horse drawn. Only 677, or 12.4 per cent, of the total horse-drawn vehicles were in use during the normal working day, so that they were not considered an important factor in the traffic situation.

The origin, route and destination of freight-carrying vehicles to and from the principal freight station within the downtown business district was the subject for another survey. A marked tendency was revealed for freight vehicles to move over a few selected routes. Other routes were available and just as short, but freight truck drivers found them less desirable to use, either because the paving was in poor condition or because parking interfered with the movement of their vehicles. The report recommends that freight pick-ups and deliveries be confined to the night hours in so far as practicable. This plan not only would speed up general traffic during the daytime, but also would prove economical for the trucking interests. The lack of spaces in which to park for unloading and picking up freight results in costly cruising. Of equal importance with the delivery and pick-up of wholesale freight is that of vehicles engaged in retail delivery. Though there is a marked diffusion of delivery routes, there is a natural tendency to follow the best and main arteries.

Traffic movement is hampered by cruising, as it is generally termed. Three types of vehicles indulge in this practice: private automobiles, trucks and taxicabs. Cruis-

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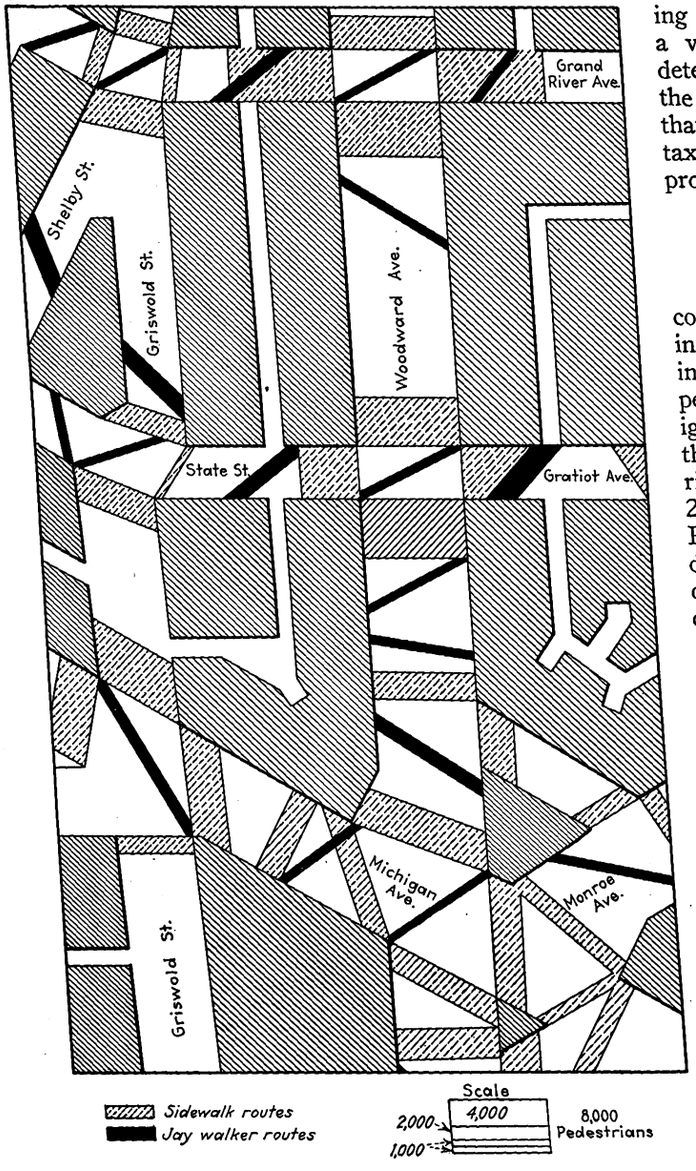

Detroit has its share of the jaywalking habit, a pedestrian count revealed

The chart shows graphically the relative jaywalker and crosswalk movements. Of 293,195 pedestrians tallied, 27,521, or 9.4 per cent, were offenders. Detroit accident statistics showed that of the total pedestrian accidents, 42.4 per cent of the fatalities and 54 per cent of the injuries involved jaywalkers.

ing is classified in the report as a high-class nuisance and a very distinct obstruction to traffic movement. To determine the amount of cruising at certain locations in the downtown district, tallies were made which revealed that it assumes surprising proportions. To remedy the taxicab situation it was suggested that more stands be provided and that automatic control boxes be installed.

Regulated Pedestrian Traffic Movement Necessary

Impatience is a pronounced pedestrian characteristic at controlled intersections, and the unwillingness to proceed in accordance with the signal indication is clearly shown in a survey made. The tally showed that of 12,566 pedestrians using a principal intersection, 44.33 per cent ignored the safety feature of the traffic signal and crossed through the traffic. Fatalities and injuries are very material from this cause, since the actual street hazard is 2½ times as great when crossing against the red signals. Pedestrian subways, overhead bridges, automatic control devices, marked lanes on the sidewalks and other means of bringing relief have been suggested, but their practicability is questionable.

Another survey of pedestrian traffic movement showed that of 293,195 pedestrians tallied, 27,521, or 9.4 per cent, were jaywalkers. This figure might seem insignificant, but of the total pedestrian fatalities and injuries in Detroit, 42.4 per cent of the fatalities and 54 per cent of the injuries were directly traceable to this class. The jaywalker not only endangers his own life and the lives of others, but he also interferes materially with the movement of traffic. Remedial measures should be applied through educational channels, and regulation resorted to only when it becomes necessary.

Surveys of the number of pupils attending 40 public schools and the respective places of residence were compiled from the records of the Board of Education. The present methods of protecting the children while crossing the streets were determined from a field survey, which revealed that there was a need for additional protection. Suggested means for school locations were the installation of more automatic traffic signals, the use of pedestrian subways and the stationing of more policemen.

Information gathered by the Accident Investigation Bureau during the first four months of 1927 gives the details of 146 accidents involving 185 persons. Of these totals, 80 accidents involving 94 persons occurred in unprotected safety zones, one accident involving one person occurred in a protected safety zone and 65 accidents

TABLE I—MODE OF TRANSPORTATION USED BY PERSONS LIVING IN DIVISION NO. 81 TRAVELING TO EMPLOYMENT DISTRICTS A TO K INCLUSIVE, CITY OF DETROIT

Type of Transportation	Districts A	B	C	D	E	F	G	H	I	J	K	Total
Walking	...	..	1	..	2	40	605	43	..	...	6	697
Driving automobiles	17	..	16	3	19	4	50	5	5	103	5	227
Riding in friend's automobile	6	..	13	..	3	2	12	1	2	...	1	40
D. S. R. cars, no transferring	40	..	5	4	190	21	140	14	..	237	6	657
D. S. R. buses, no transferring	...	..	..	..	1	..	3	..	1	11	..	16
D. U. R. cars, no transferring	...	..	..	..	...	..	...	..	..	...	..	0
D. U. R. buses, no transferring	...	..	..	..	...	..	...	..	..	...	..	0
Detroit motor buses, no transferring	2	..	..	..	4	1	21	1	3	61	..	93
Jitney, no transferring	...	..	..	..	5	2	...	..	..	53	..	60
Buses not listed, no transferring	...	..	..	..	...	..	...	..	..	...	..	0
Steam trains, no transferring	...	..	..	..	...	..	...	..	..	...	..	0
D. S. R. cars to D. S. R. cars	68	36	..	14	16	2	65	3	28	31	25	288
D. S. R. cars to D. S. R. buses or vice versa	19	..	..	..	...	..	...	..	1	3	..	23
D. S. R. cars to D. M. B. buses or vice versa	...	..	..	..	...	..	...	..	..	...	..	0
Other public service vehicle to any other public service vehicle	3	..	..	..	1	1	7	..	..	2	..	14
Total	155	36	35	21	241	73	903	67	40	501	43	2,115

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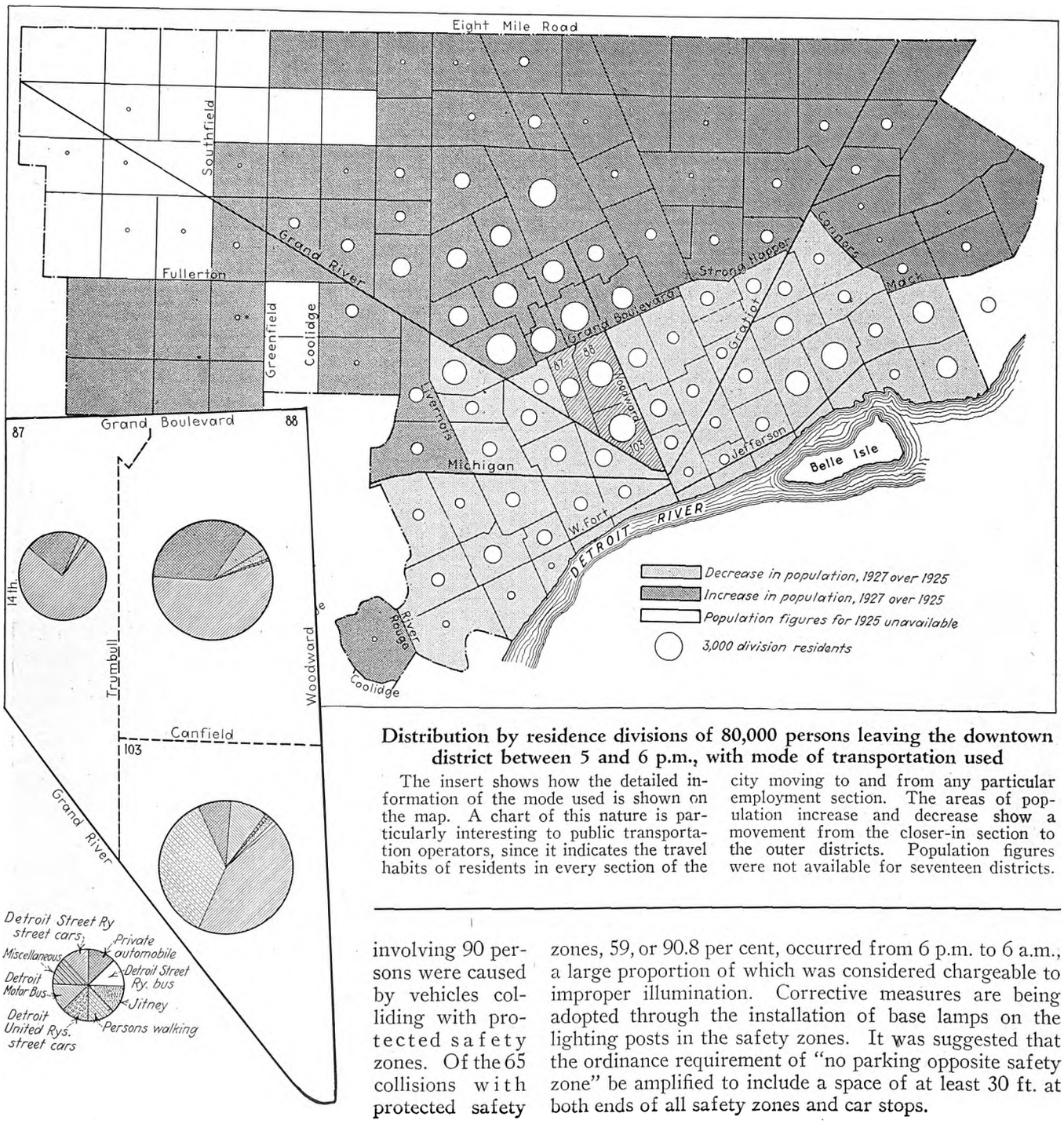

Distribution by residence divisions of 80,000 persons leaving the downtown district between 5 and 6 p.m., with mode of transportation used

The insert shows how the detailed information of the mode used is shown on the map. A chart of this nature is particularly interesting to public transportation operators, since it indicates the travel habits of residents in every section of the city moving to and from any particular employment section. The areas of population increase and decrease show a movement from the closer-in section to the outer districts. Population figures were not available for seventeen districts.

involving 90 persons were caused by vehicles colliding with protected safety zones. Of the 65 collisions with protected safety zones, 59, or 90.8 per cent, occurred from 6 p.m. to 6 a.m., a large proportion of which was considered chargeable to improper illumination. Corrective measures are being adopted through the installation of base lamps on the lighting posts in the safety zones. It was suggested that the ordinance requirement of "no parking opposite safety zone" be amplified to include a space of at least 30 ft. at both ends of all safety zones and car stops.

TABLE II—SUMMARY OF PERSONS TALLIED IN ELEVEN EMPLOYMENT DISTRICTS, DETROIT, MICH.

District	Area	Totals				Per Cent		
		Number Tallied	Walking	Using Automobiles	Using Mass Transportation	Walking	Using Automobiles	Using Mass Transportation
A	Ford River Rouge Plant	17,920	962	4,089	12,869	5.37	22.82	71.81
B	Kentucky-Rome-City Limits	536	83	147	306	15.48	27.42	57.10
C	Toledo-Junction-Michigan-Hubbard	5,900	1,062	1,496	3,342	18.00	25.36	56.64
D	Crawford-Lafayette-21st-P.M.R.R.	4,500	1,050	929	2,521	23.33	20.64	56.03
E	Highland Park	11,530	2,802	1,328	7,400	24.30	11.52	64.18
F	Antoinette-Third-Custer-Woodward	3,288	817	711	1,760	24.85	21.62	53.53
G	John R-Custer-Helen-Kirby-Trombley	18,766	4,708	3,730	10,328	25.09	19.88	55.03
H	Hamtramck	615	158	148	309	25.69	24.07	50.24
I	St. Antoine-Lafayette-East Grand Boulevard-Detroit River	5,215	1,142	644	3,429	21.90	12.35	65.75
J	Loop District	24,609	1,229	4,934	18,446	4.99	20.05	74.96
K	Canfield-Gray-East Jefferson-Hart	8,662	2,881	1,214	4,567	33.26	14.02	52.72
	Total	101,541	16,894	19,370	65,277	16.64	19.07	64.29

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The origin, route and destination of passenger travel, as well as the type of vehicles used, why they are used and the time consumed in travel are important traffic studies. To determine the travel tendencies of persons employed in several sections of the metropolitan area, mode of transportation questionnaires were distributed among certain enterprises in representative employment districts, and 101,541 usable replies received.

The questionnaires requested place of residence; place of employment; normal mode of transportation used between residence and place of employment; the total time required in traveling between residence and place of employment; if using mass transportation vehicles, the number of blocks walked between residence and such vehicle and the number of blocks walked between such vehicle and place of employment; if automobiles were used, whether they were parked in the streets or in a garage or parking lot; and the reason for the mode of transportation used.

An analysis of the 101,541 replies showed that 16.64 per cent of the persons walked, 19.07 per cent rode in automobiles, and 64.29 per cent patronized mass transportation vehicles of one kind or another. The proportion of walkers was found to be a minimum in the downtown district and a maximum in the east side district. The minimum and maximum number of persons traveling in motor cars were recorded in the Highland Park and West Warren Avenue districts, respectively. As for mass transportation vehicles, the minimum was recorded in the Hamtramck district and the maximum in the downtown district.

Further analysis showed that of the 101,541 persons tallied, 5.71 per cent procured their transportation through the use of friends' automobiles; 54.95 per cent rode the cars or buses of the Detroit Street Railway; 1.26 per cent were carried by jitneys; 4.23 per cent by the Detroit Motor Bus Company; 0.50 per cent by the Detroit United Railway and 3.34 per cent by steam trains and miscellaneous transferring means.

To obtain detailed information regarding each part of the city, the replies were separated into 132 residence divisions for Detroit and 23 divisions outside the city limits. The summary for one division, which is typical, is given in Table I. Summarized data for the eleven employment districts A to K are given in Table II. The per cent using mass transportation vehicles varies from 50.24 in the Hamtramck district to 74.96 in the downtown business district.

The data obtained from this survey were tabulated and charted to show the travel tendencies graphically. One of the accompanying maps shows the distribution by residence divisions of 80,000 persons leaving the Loop district between 5 and 6 p.m. and the mode of transportation used. The city was divided into 132 residence divisions for the purpose of the survey, and 23 divisions outside of the city limits were designated. In each division included on the map is a circle drawn to scale to represent the number of persons going to that division. Each circle, in turn, is divided into segments to show the relative numbers using the various modes of travel.

View on Jefferson Avenue showing angle-parked commercial vehicles blocking the street and part of the sidewalk as well

A summary of the reasons given by 9,954 people for the mode of transportation used by them is presented herewith: Most convenient—trolley cars; only means—trolley cars; quickest—automobiles; most economical—trolley cars; quickest and most convenient—automobiles; cheapest and most convenient—trolley cars; healthful and economical—walking; quickest and cheapest—trolley cars; dependable—trolley cars; and comfortable—automobiles.

Of those traveling by automobile to four employment districts surveyed, 33 per cent consumed more than 30 minutes of travel time; of those utilizing mass transportation vehicles, 57 per cent required time in excess of 30 minutes. A reduction in travel time to the aforesaid 77 per cent who use mass transportation vehicles would be a distinct contribution to the welfare of this number of employees. A reduction can be obtained either by workers living closer to their places of employment or by providing a faster mode of transportation.

To obtain figures on traffic direction and volume, pas-

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senger and vehicle tallies were made at four approximately concentric cordons from 7 a.m. to 7 p.m. on a certain day. With these data and data secured at certain other critical locations, a vehicular traffic flow map was prepared. This map is shown in an accompanying illustration. Another exhibit was prepared showing the origin, destination and route flow of passenger automobiles, the data being secured by questioning passing motorists on the day of the cordon count.

The results show that motor traffic tends to concentrate on certain well-known routes even though alternative routes are available. It was learned, however, that certain habitual motorists used routes that they had found from experience permitted them to avoid the congested main thoroughfares.

Improvement in street pavement, parking restrictions and automatic signals were advocated as means of diluting the traffic now concentrated on a few thoroughfares. One-way streets and reversible center lines were named as possible improvement measures for certain streets.

Transportation Controls Community Development

The trend of business and building development can be controlled to a great extent through the medium of transportation. If the business district is easily accessible there is no reason to anticipate a reduction of people traveling into and out of that district. The important requirement is that transportation, both quantitatively and qualitatively, keep pace with the development of the business district, or, better still, keep ahead of it. By this is meant, where mass transportation vehicles are concerned, there must be a sufficient number to avoid undue crowding of passengers, and the headways should be such as to make long waits unnecessary; the speeds should compare favorably with those procured through the use of individual transportation units; and last, there should be in evidence the elements which contribute to bodily comfort—that is, comfortable seats, adequate lighting, proper heating and ventilation.

Through the medium of questionnaires an attempt was made to ascertain the present trend of shopping habits. A summary of the replies received from 80,000 shoppers shows that the trend is toward downtown purchases of clothing and furniture and toward neighborhood purchases of other commodities. Sixty per cent of the replies indicated that neighborhood stores are patronized more now than was the case five years ago. Recent proposed office building construction in the downtown district permits the inference that the number of people requiring transportation to and from the district will increase, bringing about centralization rather than decentralization.

It is assumed that the merchants and property owners in the downtown business area are interested in the procurement of efficient transport to and from that area. It is further assumed that such interest is not confined to them but is distributed throughout the metropolitan area and even in the suburban territory. Because of a universal demand for more efficient transport, plans should be made to provide additional mass transportation facilities. Also, more attention should be given to speed, comfort and shorter routes.

A material increase in persons to be carried from the downtown district can be met by an increased use of mass transportation vehicles and a decreased use of private automobiles. The automobile, the bus and the trolley car have definite places in the transportation field and each must be recognized. The automobile occupying 60 to 90 sq.ft. of street space and carrying an average of 1.8 persons is far more wasteful of space than either a street car or a bus. Where there is a reasonable amount of street space available for all types of vehicles, the traveler should be allowed to exercise his option as to the type he prefers. For work, and for economic or other reasons, it is deemed necessary to curtail the use of the automobile and every consistent effort should be made to substitute a service comparable in speed and comfort.

In the conduct of the traffic study invitations were extended by letters, through broadcasting stations, personal contact and questionnaires to interested persons and organizations in Detroit to send in suggestions on traffic control and regulation. The keen interest of the general public was evidenced by the hundreds of replies received. Suggestions in regard to alley traffic were as follows: (1) Pave or cinderize, clean and illuminate the alleys; (2) enforce the rules regarding parking; (3) make the alleys wider. Those concerning safety zones were: (1) Enforce the safety zone parking law; (2) provide caution lights; (3) allow automobiles to pass the post type safety zone; (4) prohibit passing safety zones on the left. Many requests were received for more one-way streets. There was little agreement on turns and turning. The principal suggestion, however, was to prohibit left turns off the main arteries. Many asked that all streets with car lines be made stop streets.

Many ideas were evoked with regard to the parking situation. The more popular suggestions were: (1) Prohibit all-night parking; (2) allow no double parking; (3) prohibit parking on stop streets; (4) permit no parking on car line streets; (5) abolish parking within the Loop district; (6) have more free parking space in the Loop district.

Car Heating at Low Cost

Use of resistor losses for car heating in combination with regenerative braking has proved successful in an experimental car in Joliet, Ill.

Look for the feature article on this subject

In Next Week's Issue

which is devoted to Maintenance and Construction.

No Change in Chicago Parking Ordinance

In an abstract of an article on traffic and traffic control in various large cities by Dean J. Locke, published on page 548 of the March 31, 1928, issue of Electric Railway Journal, a statement was made "Within the past few days opponents of the plan have succeeded in securing an amendment to the ordinance permitting ten-minute parking of passenger automobiles within the Loop district of Chicago." It now appears that no modification of the ordinance effective Jan. 10, 1928, prohibiting parking in the Chicago Loop section during business hours has been made. It also appears that the few who earlier were opposed to the ordinance have now been converted and that there is no agitation to change it.

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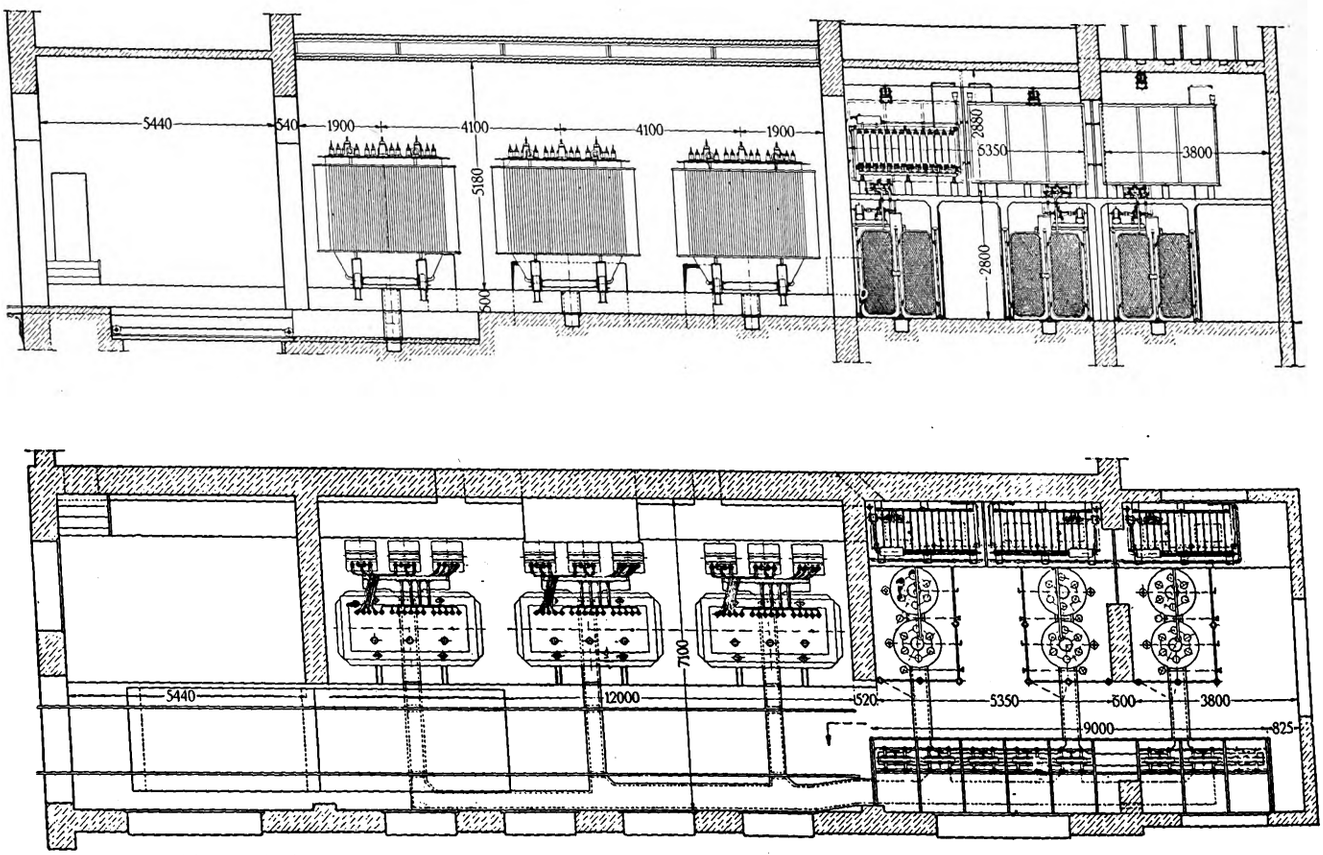
Mercury-Arc Rectifier Substations Used on European Railways

Adoption of 1,500-volt direct-current system by French government has necessitated extensive changes in power supply of Midi Railway



Plan and elevation of Montrejeau Station of the Midi Railway, furnishing 1,500-volt direct current through six 600-kw. mercury-arc rectifiers

CONSIDERABLE interest is being shown in Europe in the adoption of mercury rectifiers for substation operation on electrified main lines, and the outstanding success achieved by the first rectifier stations to be used on normal gage lines at a tension of 1,500 volts has stimulated inquiries for this equipment for similar pressures on other main lines. These first mercury-arc rectifiers for railway substations were installed at Pau, Lourdes, Tarbes and Montrejeau on the Midi Railway of France, by the British Brown-Boveri Company, Ltd.

The French government decided some time ago to standardize both the primary and trolley wire currents of all the electric railways, so that various power plants could work in parallel and the locomotives could be used on any of the electrified lines. Finally a line pressure of 1,500 volts direct current was decided on, and the Midi Railway was faced with the difficult task of transforming the already existing plants and of drawing up a new program of electrification.

The equipments of the four substations given above are identical, and consist of three three-phase, oil-immersed transformers with natural cooling and short-circuit proof-winding supports, each built for 1,750 kva., pressure ratio 60,000/1,425 volts (twelve phase); six absorption choke coils, each 188 kva., 150 cycles, with natural cooling; three absorption choke coils, each 188 kva., 300 cycles, with natural cooling; six mercury-arc rectifiers, type GRZ 156, each built to deliver 600 kw.; three vacuum pump sets; three circulation cooling equipments; 60,000-volt a.c. switchgear; 1,500-volt d.c. switchgear and auxiliary equipment.

Another substation on the same system, that at Lannemezan, is similarly equipped, but contains four transformers, each of 1,750 kva.; eight absorption choke coils for 150 cycles; four absorption choke coils for 300 cycles; and eight mercury-arc rectifiers, each 600 kw.

Each transformer with three absorption choke coils and two mercury-arc rectifiers with accessories forms a set with rated output of 1,200 kw. The output of each of the four substations is therefore 3,600 kw., and that of the Lannemezan station is 4,800 kw. The aggregate

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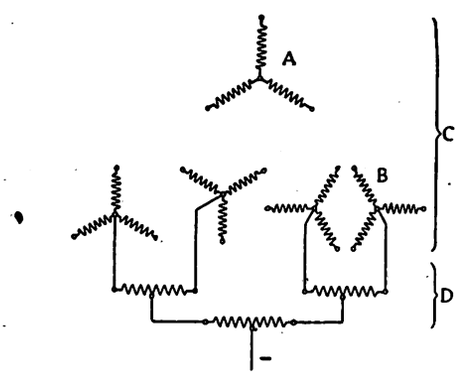
output of all the substations amounts to the total of 19,200 kw. In each station one set serves as a stand-by.

The 60,000-volt high-tension switchgear presents no new features. The twelve anodes of the rectifiers forming a set are directly connected to the twelve phases of the transformer over anode disconnecting switches. The secondary winding is subdivided into four three-phase systems displaced one from the other by 90 electrical degrees, and the four star points of these systems form the negative pole of one set, as shown in one of the diagrams. The cathodes of both rectifiers, which form the positive pole of the d.c. system, are connected to one another over two disconnecting switches. They have a common d.c. automatic circuit breaker by means of which the set can be linked up to the positive busbar.

The interlocking of the primary and of the d.c. automatic switches is shown in the special wiring diagram. The switching in push button B_1 serves to operate the



The four secondaries of the main three-phase transformer provide a twelve-phase circuit for the rectifiers

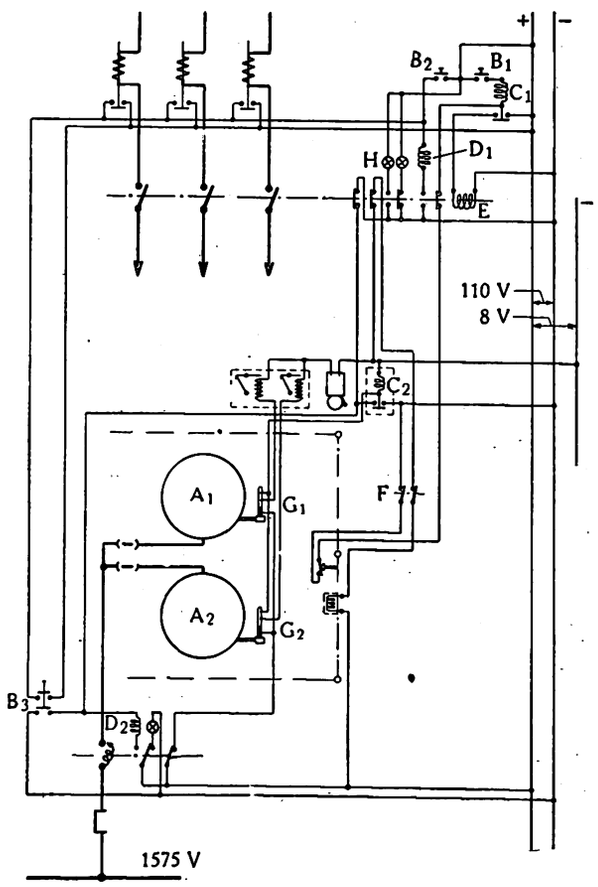
A. Primary winding.
B. Secondary winding.
C. Transformer.
D. Absorption choke coil.

oil switch, which is provided with switching-in and tripping solenoids. This push button causes relay C_1 to act, which puts the switching in coil E under pressure. The oil switch and relay C_1 can, however, only be operated when the following conditions are fulfilled: (1) The oil switch is open; (2) the door of the protecting screen round the rectifier is closed, and (3) the hand switch F is closed.

The push button B_1 is used to trip the oil switch by connecting the tripping coil D_1 to the auxiliary busbars. The position of the switch is indicated by the two lamps H. The d.c. automatic circuit breaker is equipped with an over-current coil and a tripping coil and has to be closed by hand. The tripping coil is so connected to the oil switch on the primary side that it is only possible to close the automatic circuit breaker after the oil switch has been closed. If the primary oil switch trips, the automatic circuit breaker is immediately tripped as well. The object of this interdependence of the two switches is to prevent rectifiers A_1 and A_2, for example, being put under pressure from the d.c. side. As, contrary to other machines and apparatus, the casing of the rectifiers is under pressure when in service, this precaution is essential for the protection of the operators.

Further protection is afforded by the screen round the rectifiers, the door of which is provided with a special lock, which can only be opened or closed when its interlocking coil is energized. In order to make it only possible to open the door when the oil switch is open, the circuit of this interlocking coil is led over an auxiliary contact on the oil switch shaft, which contact is only closed when the switch is open. Further, in order to cut off the current through the coil during a long interruption of service, a two-pole hand switch, F, is provided, over the second pole of which the current of the switching-in relay C_1 is led, so that it is impossible to put the set into service again under these conditions.

To cut out a set, the d.c. automatic circuit breaker is first operated by hand and then the push-button switch B_2. If, on the other hand, a set is to be cut out suddenly for some reason, it is simply necessary to operate push-button switch B_3, which is specially marked and which



Special wiring of the rectifier for automatic operation

A_1, A_2. Mercury-arc rectifiers.
B_1. Switching-in push button.
B_2. Tripping push button.
B_3. Push button for switching out rectifier set.
C_1. Auxiliary relay for actuating the switching-in coil.
C_2. Auxiliary relay.
D_1. Tripping coil of oil switch.
D_2. Tripping coil of the d.c. automatic circuit breaker.
E. Switching-in apparatus.
F. Hand switch.
G_1, G_2. Contact thermometer.
H. Signal lamp.

causes both tripping coils D_1 and D_2 to act simultaneously, thus isolating the set from both sides.

In order to protect the rectifier from excessive temperatures resulting from heavy loading, high surrounding temperature or failure of the cooling water supply, special alarm devices are provided which are influenced by the contact thermometers G_1 and G_2 mounted on the anode plates. As soon as the temperature exceeds 50 deg. C. a disk relay acts and operates an alarm bell. This disk shows which of the rectifiers has caused the alarm device to act. A second contact, which closes when 60 deg. is reached, acts on relay C_2, the closing contact of which is in parallel with push-button switch B_3, and puts the tripping coil D_2 of the d.c. automatic circuit breaker under pressure.

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The auxiliary circuit, supplied at 200 volts, 50 cycles, feeds the motor of the circulating pump and that of the air pump, as well as the heating plate belonging to the high vacuum pump. To ignite the rectifier two small motor generator sets, each of 0.6-kw. output, are installed in each station.

The rectifiers are composed of two high-grade steel cylinders, one above the other and of different diameters. The lower and wider of the two forms the arc chamber. It is welded round its lower circumference to the funnel-shaped steel baseplate, in which is located the cathode. The upper and narrower cylinder forms the cooling dome or condensing cylinder in which the mercury vapor condenses in the form of drops and flows back to the cathode. The top and bottom of this cylinder are welded to massive steel plates. The upper plate carries the bosses for the connections of the vacuum piping and ignition gear. The latter is composed of a solenoid, to the iron core of which the ignition rod is attached in the vertical axis of the cylinder. The lower plate forms a ring and constitutes a cover for the arc chamber. It carries the six main anodes and the two excitation anodes, placed round the condensing cylinder. The arc chamber is not welded to the anode plate and the joint between them constitutes the primary mercury seal of the apparatus. If necessary, therefore, the upper part of the apparatus, together with the anodes, can be raised for inspection of the rectifier.

All the electrodes are carried into the arc chamber through porcelain bushings of high heat resisting qualities and mechanical strength. The electrodes are carefully insulated from the chamber. The mercury seal serves as a packing between the electrodes and the bushings, as well as between the latter and the arc chamber. It is also used between the anode plate and the arc chamber.

The cylindrical anodes are of polished iron, carrying at their upper ends terminals for the leads supplying the rectifier. To facilitate cooling, ribbed cast-iron sleeves are drawn over the upper part of the anodes. The cathode is built as a receptacle and holds about 48 kg. (104 lb.) of chemically pure mercury. It is situated in the baseplate and the joint is sealed with mercury. Both the arc chamber and the condensing cylinder are surrounded by a sheet-metal casing which serves as a water-cooling jacket. Each pair of rectifiers is equipped with a two-stage vacuum pump to exhaust the air and obtain the high vacuum essential. Each rectifier set is equipped with a separate cooling system.

An elevation and plan of the Montrejeau station, which is typical of the others, are shown in one of the illustrations. About half the total space in the substation was available for the equipment proper, the other half being required for the 60,000-volt apparatus. The rectifier transformers with the absorption coils were lodged in the rooms which formerly held the single-phase transformers when rotary converters were used. To carry off the heat generated by the losses of the naturally cooled transformers and choke coils, apertures which existed already between the cellar and transformer room were available, and these provide sufficient cold air draft. Parallel to their length there is a gangway with a standard gage railway track on which a special truck can be run, and placed exactly opposite the transformers. To aid in lifting the active part out of the tank, when necessary, there is a special pit with hoisting gear.

The rectifiers with their accessories and the switchboard are installed close to the place originally occupied by the auxiliary machines and apparatus. The rectifier sets are situated by themselves and are under easy supervision from the switchboard opposite. The ignition and excitation apparatus is located in the switchboard.

In order to ascertain the efficiencies of the plants installed, the power received was compared with the power delivered, with the following results:

Load	1/4	2/4	4/4	5/4
Input, kilowatts	350	692	1,325	1,670
Primary pressure, volts	7,775	7,725	7,650	7,600
Primary current, amperes	30.0	54.5	102	131
Direct current, amperes	195	403	790	1,010
Direct-current pressure, volts	1,671	1,642	1,598	1,569
Output, kilowatts	326	655	1,262	1,585
Power factor	0.805	0.905	0.962	0.965
Efficiency attained, per cent	93.2	94.7	95.3	95.0
Efficiency guaranteed, per cent	92.0	94.5	95.1	95.0

The rectifiers have proved very satisfactory in service, and during the first six months of installation each station had to withstand about 230 short circuits. The station operators are said to prefer working on rectifiers to rotary converters on account of the noiseless operation of the rectifiers.

Modern Carhouse at Detroit Completed

Constructed at a cost of $75,000, it will effect a huge annual saving. The terminal has outside storage facilities for 250 cars

In addition to the repair shop the carhouse has ample office space, sleeping quarters and assembly rooms for the trainmen

RECOGNIZING a long-felt need for suitable terminal facilities in the northwestern section of Detroit and realizing that a saving of approximately $500,000 annually could be effected, the Department of Street Railways determined to provide the needed facilities. Accordingly during the early part of 1927 the management purchased a 20-acre tract for the development of such a terminal. The land is located on Coolidge Highway and cost $280,000. Construction began soon afterward and the building, costing $75,000, was formally opened on Feb. 26 of this year. It was built according to plans and specifications drawn by the department engineers and is modern and practical. It was designed and constructed to serve efficiently as both a storage and repair terminal for the street cars of the northwestern district. Segregation of the Grand River Avenue and the Jefferson Avenue lines will be made possible by the new terminal.

The carhouse has four tracks extending the entire length of the building. Three of these have work pits accommodating four cars each so that twelve cars may

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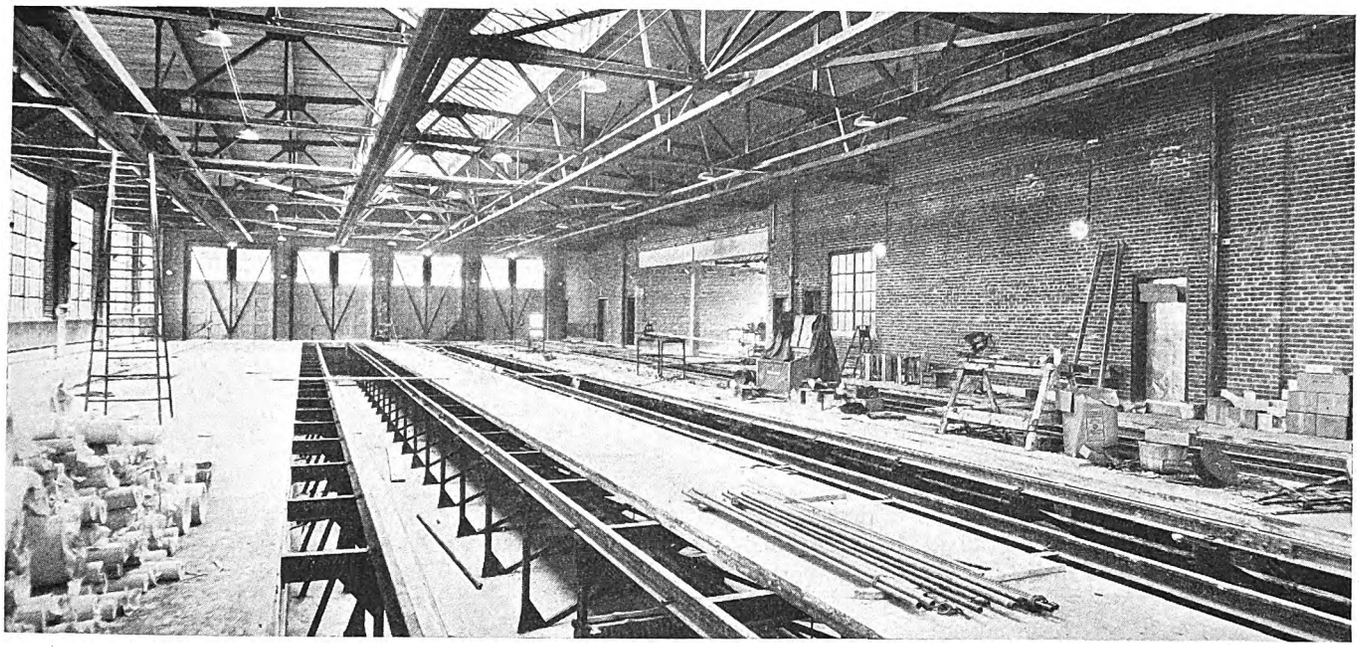


Four tracks extend the entire length of the carhouse, three of which have work pits accommodating a total of twelve cars

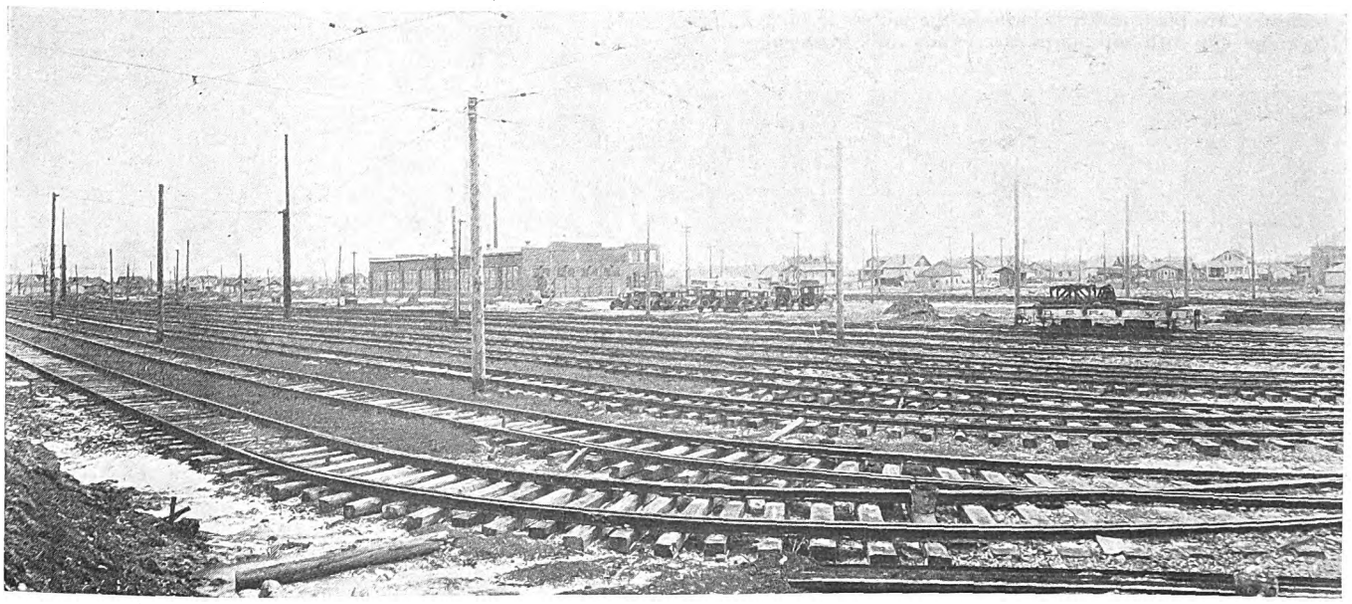
undergo repairs at the same time. Along the fourth track is a shower-spraying device through which the cars pass for their semi-weekly bath. Another portion of the building is devoted to offices of the division superintendent and terminal clerks, while the trainmen's lobby occupies the remaining portion of the ground floor. On the second floor are the trainmen's assembly room and dormitories which provide sleeping quarters for the men who have certain late and early runs.

The storage tracks, adjacent to the building, will accommodate 250 cars and provides for rotary movement, making it unnecessary to back or turn any cars in entering or leaving the property. The Grand River line will be the first to utilize this new terminal station, and this arrangement alone will result in a saving of approximately $225,000 annually through the elimination of waste mileage now consumed in storing the Grand River cars at the East Jefferson Avenue carhouse.

The terminal has a spur track leading to one of the principal railroads, so that raw materials like sand, gravel, crushed stone, steel rails, ties, etc., can be transferred conveniently. They will be stored in the yard and distributed to locations on the west side of the city as needed.

Work has been started on a modern garage on the same plot which will store 80 motor coaches. Most of these are now being kept in rented garages in the northwestern section. The new garage will be ready for occupancy in 90 days, and it is anticipated that by midsummer 1,000 men will be working from the combined railway and bus terminal.

Realty values showed a decided upward trend with the development of the tract. The construction plans of the Department of Street Railways were laid out to allow for a frontage of 663 ft. along Coolidge Highway available for resale. It is believed that this may be sold for a sum nearly equivalent to that paid for the entire tract.



The new terminal for the northwestern section of Detroit has outside storage facilities for 250 cars

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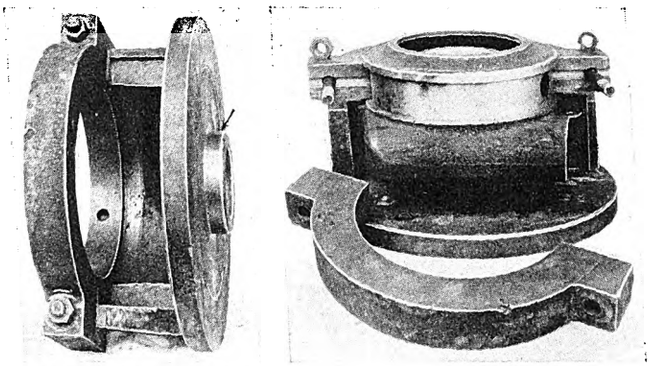
Maintenance Methods and Devices

Jig Insures Accurate Boring of Armature Bearings in Housings

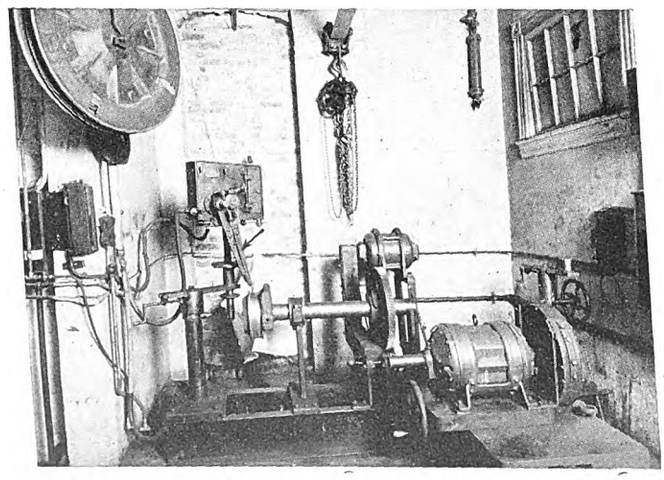
By J. A. Duffy
Superintendent of Equipment Monongahela West Penn Public Service Company, Fairmont, West Virginia

BORING of armature bearings after they have been pressed in motor housings is the practice of the Monongahela West Penn Public Service Company. To make certain that the bore of the bearing is centered accurately from the outside finished portion of the housing, a special jig is used. This is shown in the accompanying illustrations, arranged for a Westinghouse type 306 motor housing. The jig is for split frame motors but can be used for any motor by having suitable filler rings. After the bearing has been pressed in, the housing is clamped in the jig and is then set on a face plate or put in a lathe for boring. One end is arranged as a guide for the boring bar. This self-centers the job ready to be bored out.

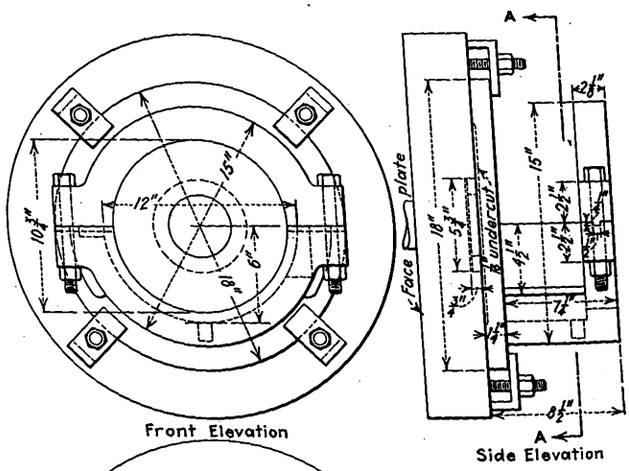
It is also the practice of the railway to build up the outside portions of Westinghouse 306 motor housings that have been worn and so are somewhat loose in the motor shell. The housing is placed in a welding and grinding machine so that the housing is rotated as it is welded. An extension welding arm is arranged so as to get close to the work. When the machine is started the welding head automatically does the welding of one bead and the operator shifts the arm when the machine automatically welds up another bead without further attention.

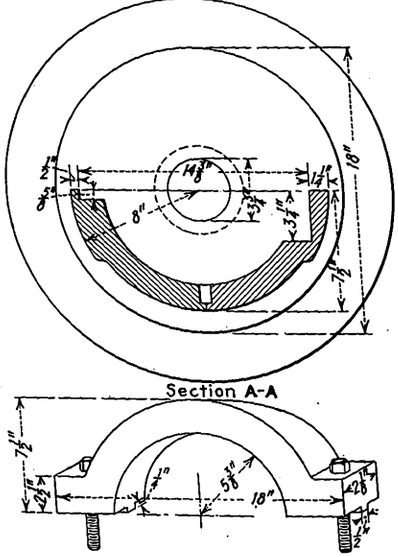


At left—Type of jig used for boring out motor housing. Arrow indicates face plate which self-centers the job ready for boring. At right—Jig with housing in place ready to be clamped



Building up the outside surface of a motor housing. Arrow shows extension arm provided to get close to the work





Details of jig for boring armature bearings

Winders Portable Tool and Material Rack

SINCE considerable time is lost when material and tools are not within easy reach of the armature winder and as a result production suffers, General Foreman Johnson of the Binghamton Railway, Binghamton, N. Y., designed and constructed a portable rack to avoid the delay caused by going for tools and material frequently. This rack is all metal and is made of angles, sheet steel and pipe. Four ¾-in. conduits form the corner posts. The top of each is

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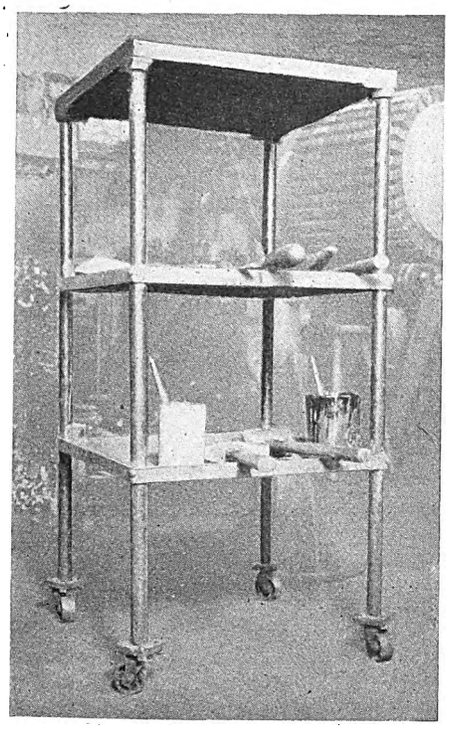


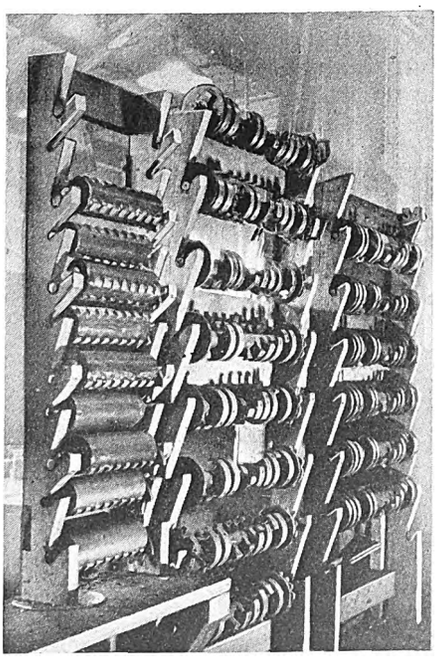
Convenient material rack for the electrical repair department

fitted with a ¾-in. 90-deg. flange and the bottom with a 2-in. swivel roller. A tray 18 in. square and ¾ in. deep is made of 1-in. angles and ⅛-in. plate. All joints are acetylene welded. This tray is bolted to the 90-deg. flanges by ⅜-in. machine bolts. A similar tray is installed 13 in. below this and still another one 12 in. further down. It should be noted that the angle framework for the middle and lower trays is shaped around the outside of the ¾-in. posts and fastened to the post by a ⅜-in. through machine bolt. The sheet steel bottom of these trays is welded to the angle in the same manner as was done in constructing the top tray. This rack is very well constructed and no motion exists between any of the parts. Since it contains three 18x18-in. trays ample space is provided for the storage of practically all the material and tools necessary for a complete winding job. The rollers permit of easy movement to any position convenient for the performance of the work.

Controller Main and Reverse Cylinder Racks

IF OVERHAULED controller cylinders are not taken care of properly prior to installation in the controller, there is a possibility of damage. Where this occurs it is not detected very often until after installation or when a road failure has developed and interrupted service. Where this possibility exists it is important that some precautionary measures be taken. On the New York & Harlem Railroad, New York City, care is exercised to protect repaired controller cylinders. A cylinder storage rack adjacent to the overhauling bench is used for the storage of the cylinders until they are required for service. The rack referred to is shown in the accompanying illustration. The main cylinders are stored on a rack made from 2x5-in. oak boards installed vertically at the proper centers to accommodate the cylinders and tied together top and bottom by a 1x3½-in. oak board. The front of these uprights is provided with 1x8½-in. notches cut at an angle of 25 deg. on 6-in. centers. These notches provide a safe and substantial support for the cylinder shafts. Each rack will hold seven cylinders. The same construction is followed for the reverser cylinders except that the boards are 4 in. wide, the slots 1x2½ in. and the centers 4 in. It will accommodate eleven cylinders.

These racks contain completely overhauled cylinders and every man in the shop knows that any cylinder stored here is available for service.



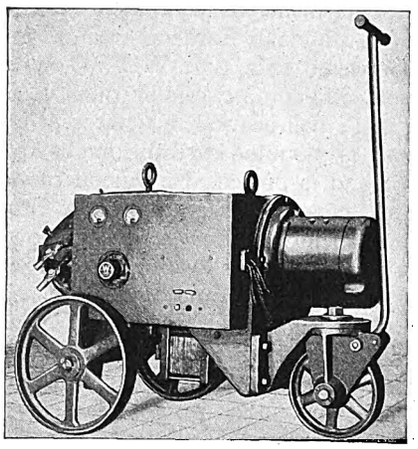
Storing cylinders in this neat and systematic manner has improved the shop appearance and lessened the possibility of mechanical injury prior to installation

They serve a further purpose in that the overhauler can see the exact number of O.K. cylinders on hand at a glance.

New Equipment Available

Single Operator Arc-Welder

PUSH-BUTTON control features a Westinghouse, 200-amp. single-operator welding set, designed to meet requirements in both shop and field. The set is started by connecting directly across the line by means of a line starter and line-start motor.



One-man 200-amp. arc welder

Starting and stopping are accomplished by a push button. A single rheostat varies the arc current over the entire welding range. Accurate adjustment from 60 amp. to 300 amp. is afforded by steps of 5 amp.

The motor-generator and control equipment are assembled in a totally inclosed frame. The exciter, which is overhung from the motor end, is fastened securely to the unit frame, guarding the operator against injury and protecting the set from dirt and falling objects.

Steady welding current, insuring thorough penetration and fusion of the weld, is obtained from a constant-current generator. A separate exciter insures a high speed of welding, and a generator voltage that responds to any changes in arc conditions. This tends to maintain a constant rate of fusion of the electrode.

The unit is rated at 200 amp., 1 hour, 50 deg. C. temperature rise on a resistance load at 25 volts. This conforms to the standard rating of the

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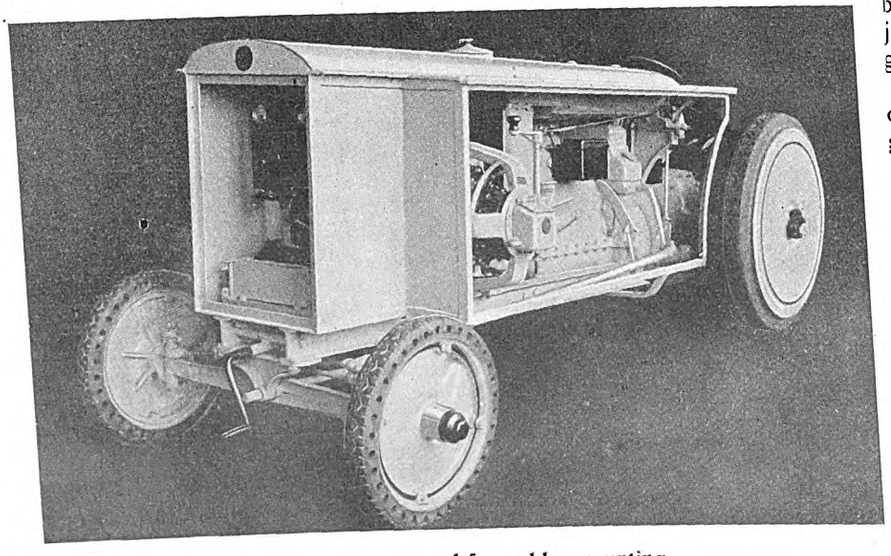
National Electrical Manufacturers' Association. The motor is wound for 220 or 440 volts and is assembled with the necessary connections made for driving from a three-phase 60-cycle circuit. For use on a 440-volt, three-phase, 60-cycle circuit, it is only necessary to replace the operating coil on the magnetic starter and to reconnect the motor leads.

Welder Tractor Combination

COMBINATION of an electric arc welder with a Fordson tractor in an improved form is now offered by the General Electric Company, Schenectady, N. Y. The chief improvements of the outfit consist of the substitution of a new type welding equipment and the addition of head and tail lamps and a protective cover.

The principal equipment consists of a standard Fordson tractor, belt-connected to a type WD-300-A, 25-volt, 300-amp., one-hour rated 1,750-r.p.m., ball-bearing generator. This unit is mounted directly on the tractor and is protected by metal canopy and canvas side curtains. Other equipment includes governor, power take-off, muffler, waterproofed pulleys on engine and generator, belt and belt tightener, industrial disc-type rubber-tired wheels front and rear, extension frame, off-set crank, control panel and reactor, head and tail lamps, and battery and charging control. Light industrial spoke-type wheels front and rear or standard Fordson farm wheels front and rear, and any other desired accessories are optional.

The over-all length of the complete unit is 12 ft.; the height is 4 ft. 8 in.; the width is 5 ft. 2 in., and the net weight is approximately 4,900 lb. The utility of the tractor as a hauling device has not been impaired. For field use, the unit will haul equipment and tools to the job and then supply welding current. For welding along railroad rights-of-way, extra long welding leads are not necessary because the equipment is so easily moved at a moment's notice. The battery which supplies current for the lights and ignition is charged while the welding generator is operating. It is provided with ammeter and automatic cutout.

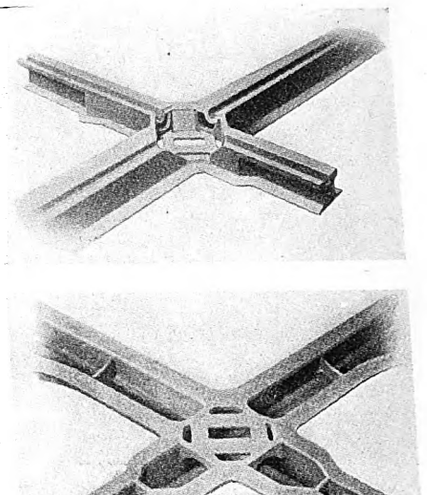


Fordson tractor used for welder mounting

Manganese Crossing Designed Scientifically

DESIGNED for use in electric railways where they cross steam runs or for heavy steam railroad traffic, a scientifically constructed manganese crossing is announced by William Wharton, Jr., & Company, Inc., Easton, Pa. This has been brougnt out as a result of a scientific investigation and study of manganese crossing designs made during the last four years by engineers of the company. The investigation was made from two major viewpoints: first, to obtain minimum unit stresses in the structure when in service, and, second, to determine just what sections could be cast and heat-treated with the assurance that the metal would be sound throughout.

The new type of crossing incorporates a number of new features. In the first place, there is uniformity in the metal sections under the tread and groove surfaces, an advantageous feature which became evident early in the investigation. There are no supporting members joining the under side of the tread and groove metal, thereby eliminating the danger of shrinkage, cavities and heat treatment defects in the metal surrounding the intersection of the gage lines, the point where most crossings fail. A bottom grid or floor beneath the intersection of the flangeways forms a



Features of the manganese crossing

hollow, box-like structure at this point, which is said to give the crossing extreme resiliency and strength, and at the same time avoids excess weight.

Cross-members in the arm sections of the crossing form a strong tie to prevent the side walls from spreading, but these members do not come in contact with the under side of the tread or groove surfaces, thereby avoiding the possibility of interior defects which so frequently cause cupping in the tread surface. The side walls of the crossing are tapered, being thicker at the top where they join the under side of the tread and guard sections.

This feature was incorporated to decrease the unit stresses in the groove and to permit a gradual transition of metal sections, from the thick tread to the thin outer flange of the base.

In arriving at the new features of this crossing, the Beggs method of analyses of stresses was followed, using a Beggs deformeter, and studying the resulting stress reactions under the microscope. The findings in these studies were checked by Prof. Mortimer F. Sayer of Union College, employing a photo-elastic model method of polarized light analysis, and the results produced were found to be remarkably close.

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American Association News

Rules for Engineering Committees

MEMBERS of the various committees of the Engineering Association are receiving from General Secretary J. W. Welsh copies of a pamphlet giving the regulations governing committees, the adoption of standards, and the style of specifications. This is a revision of a former publication on the same subjects. It includes sections on the purpose and scope of committee work, committee organization, instructions to committees, committee reports and standardization rules, American Engineering Standards Committee, illustrations, style of specifications, Engineering Manual and changes in rules.

The instructions to committees give clearly the procedure in conducting committee work and joint work with other organizations, a list of abbreviations and material to be included. Specific instructions are given for the preparation of reports, formulation of recommendations, and methods of preparing illustrations and specifications.

Purchases and Stores Accounting

MEMBERS of two association committees held a joint meeting in the offices of the Cincinnati Street Railway, Cincinnati, Ohio, on March 19. These were the purchases and stores committee of the Engineering Association and the stores accounting committee of the Accountants' Association. Subjects discussed were the review of the Engineering Manual, led by J. Fleming; unit piling and standard packages, led by W. E. Scott; investment in materials and supplies, led by C. A. Harris, and price records and pricing materials and supplies, led by A. A. Ordway.

Those present were J. Y. Bayliss, chairman; A. A. Ordway, vice-chairman; W. J. Walker, secretary; B. W. Forkner, A. L. Fischer, A. E. Hatton, C. A. Harris, H. B. Kirkland, F. E. Wilkin, W. S. Stackpole, A. S. Duncan, W. E. Scott, E. A. Murphy and John Fleming.

T. W. Casey to Represent Association at Rome

THOMAS W. CASEY, president National Pneumatic Company, has been appointed by the American Electric Railway Association its official representative at the Rome convention of the Union Internationale de Tramways, de Chemins de fer d'Intérêt Local et de Transports Publics Automobiles. Mr. Casey sailed on the *Roma* for Naples on April 13.

Mr. Casey is a member of the executive committee of the association.

A.I.E.E. Regional Meeting at New Haven

INSPECTION trips and technical papers of unusual interest make up the program of the fifth annual meeting of the Northeastern District, American Institute of Electrical Engineers, to be held at the Hotel Taft, New Haven, Conn., May 9-12.

A major part of the four technical sessions will be devoted to four unique engineering developments in the vicinity. These include a hydro-electric project, electric railway power from rectifiers, variable-ratio frequency changers and mercury turbines. A paper will be presented on the exclusive use of mercury-arc rectifiers for supply power to a trolley system and another on inductive co-ordination between the railway feeder system and local communication circuits where these rectifiers are in use. The economics of power supply for railroad electrification will be covered by another paper.

Two papers will deal with 25-cycle power obtained through two variable-ratio frequency-changer sets, one deriving power from another 25-cycle source, and the second, power from a utility system at 60 cycles.

Members of the purchases and stores committee and the stores accounting committee in session at Cincinnati

Left to right: B. W. Forkner, A. L. Fischer, A. E. Hatton, C. A. Harris, H. B. Kirkland, W. J. Walker, J. Y. Bayliss, A. A. Ordway, F. E. Wilkin, W. S. Stackpole, A. S. Duncan, W. E. Scott, E. A. Murphy and John Fleming.

COMING MEETINGS OF *Electric Railway and Allied Associations*

April 25-27—American Society of Civil Engineers, spring meeting, Washington Hotel, Washington, D. C.

April 25-27 — American Welding Society, annual meeting, 33 West 39th Street, New York, N. Y.

April 26-28—Missouri Association of Public Utilities, Jefferson City, Mo.

May 2-5 — Southwestern Public Service Association, Dallas, Texas.

May 4 — Metropolitan Section, A.E.R.A., 33 W. 39th Street, New York, N. Y.

May 6-12—Union Internationale de Tramways, de Chemins de fer d'Interet Local et de Transports Publics Automobiles, Rome, Italy.

May 8-11—United States Chamber of Commerce, Washington, D. C.

May 9—A.E.R.A. Executive Committee, Washington, D. C., 3 p.m.

May 9-10—Central Electric Railway Master Mechanics' Association, Lawrence Hotel, Erie, Pa.

May 24—New England Street Railway Club, annual meeting, Boston, Mass.

June 4-6—Midwest Electric Railway Association, Hotel Baltimore, Kansas City, Mo.

June 6-8—Canadian Electric Railway Association, annual convention and exhibits, Toronto, Canada.

June 20-27 — American Railway Association, Div. 5—Mechanical, annual convention and exhibit, Atlantic City, N. J.

June 21-22 — American Railway Association, Motor Transport Division, Atlantic City, N. J.

June 28-29—Central Electric Railway Association, Cedar Point, Ohio.

July 8-12—Public Utilities Advertising Association and International Advertising Exposition, Detroit, Mich.

July 25-27—Electric Railway Association of Equipment Men, Southern Properties, Cincinnati, Ohio.

July 27-28—Central Electric Railway Accountants' Association, Detroit, Mich.

Aug. 16-17 — Wisconsin Utilities Association, Transportation Section, Sheboygan, Wis.

SEPT. 22-28, 1928

American Electric Railway Association, 47th annual convention and exhibit, Cleveland, Ohio.

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News of the Industry

Ultra Modern Chicago

Surface Lines engineer urges three-level streets and rigid traffic code to improve safety

Public safety in the city of Chicago is being hindered by the present deplorable physical condition of its streets, E. J. McIlraith, traffic engineer for the Chicago Surface Lines, told delegates to the Midwest Safety Conference recently held in that city.

Mr. McIlraith blamed poor paving outside street car tracks and rough pavement on many streets in residential sections for the hazards and delays to traffic. In order to provide funds for necessary repairs he recommended that a new gasoline tax law be enacted to take the place of the one recently declared unconstitutional and revoked by the Illinois Supreme Court.

Safe travel in Chicago's densely congested streets, he said, would be greatly enhanced by provision of a three-deck street system in the downtown business district. Such a system should include a subway, an intermediate thoroughfare for pedestrians and at the present street level a street for motor traffic. He declared:

Chicago is in a deplorable condition for lack of transportation facilities, continuous streets, smooth paving, grade separations and convenient access to radial highways.

Sufficient through streets are lacking because everywhere they are interrupted by railway yards, embankments, rivers, canals, parks and undivided areas.

Simple planning and reasonable investment, however, will make a marvelous improvement in traffic convenience. Improvements for the future must also include grade separations and perhaps two-level highways where justified.

The outstanding fault responsible for most traffic accidents, it was said, was the laxity of law enforcement. Mr. McIlraith advocated the adoption of a traffic code that will inflict severe punishment on the careless and law-ignoring drivers who annually kill hundreds of Chicagoans and injure thousands.

He added that since the no-parking ordinance was put in effect on downtown streets last January, a survey has shown that accidents have decreased more than 30 per cent.

One-Fare Extensions Considered by Missouri Body

The Missouri Public Service Commission has under advisement several applications for an extension of the St. Louis, Mo., one fare zone to various sections of St. Louis County. Commissioner John H. Porter on March 29 concluded a hearing on the proposals at the St. Louis City Hall. The city of St. Louis and the St. Louis Public Service Company opposed the proposed fare concessions while numerous real estate dealers and officials of some of the incorporated communities which are located in St. Louis County favored the applications.

The company and the city of St. Louis contended that the county lines are now operating at a loss and any deduction from the revenues of the Creve Couer Lake and Clayton lines as proposed would tend to react unfavorably on the rates in St. Louis. William B. Bennett, valuation engineer for the company, testified to the average revenue per car-mile in St. Louis and declared that if transfers to the Clayton line were permitted and each car carried the maximum number of passengers the line could not pay.

At present transfers are furnished from the Olive-University to the Kirkwood-Ferguson cars going to Clayton and vice versa. The railway company favors doing away with this concession now that other parts of the county are seeking a similar privilege.

Fare Changes in Los Angeles

Local charges on Pacific Electric are reduced to 5 cents. Suburban reductions range from 20 to 25 per cent. Experimental rates to go into effect between certain cities

SWEEPING changes in the Pacific Electric Railway's fare schedule in Los Angeles and adjoining counties were announced by the California Railroad Commission on April 7. Approximately two-thirds of the one-way and round-trip fares charged by the company, affecting about that proportion of the bulk of the company's business, are to be reduced. The order is to be put into effect within twenty days and to remain in force until further ruling of the commission.

Local fares in Long Beach, Glendale, Riverside, San Bernardino, San Pedro, Santa Monica and other centers are to be reduced by the commission's order from 6 cents to 5 cents. In Los Angeles the present fare of 6 cents which the Pacific Electric has been charging is to be reduced to 5 cents, but the fare zones are to be made smaller. Reductions on suburban one-way and round-trip fare schedules will range from 20 to 25 per cent. At the same time the commutation rates are to be increased from 10 to 20 per cent on practically all lines. An experimental monthly pass, good for daily travel between Los Angeles and Pasadena and entitling the holder to local transportation on both ends of the line, is to be issued for $9. A Sunday pass, good for unlimited travel on all lines of the road west of Upland and exclusive of the Mount Lowe division, will sell for $1. This pass will be limited in use to the Sunday for which it is sold. The commission's order states that the commutation rate structure is simplified by the elimination of some of the forms of tickets to be sold, namely, the monthly, 30-ride and 10-ride tickets.

The order reads in part as follows:

The general basis of the experimental fare structure authorized and directed by the decision is the so-called Glendale experiment which has been in progress for nearly a year, and from which satisfactory results were obtained. In general, the Glendale experiment provided for an increase in commutation fares and a substantial decrease in one-way and round-trip fares.

Under this Glendale experiment patronage of the line gradually increased until the financial results to the company were more satisfactory although, on the whole, the fares were lower than formerly.

The schedule, the commission announced, is an experimental one to test its theory—that keeping fares at or close to 5 cents will develop more business, and thus eventually result in increased revenues.

Experimental fares, between Los Angeles and Venice and Santa Monica, of 30 cents one-way and 50 cents round-trip have been ordered. In general round-trip fares will be double the one-way fare, less 5 cents where the one-way fare is 15 cents, and not more than 25 cents, and less 10 cents where the one-way fare is in excess of 25 cents.

Survey Bill Killed in St. Louis

The St. Louis Board of Aldermen on March 30 killed by a vote of nineteen to nine Mayor Miller's bill for the establishment of a transportation survey commission which presumably would have paved the way for a rapid transit system in the city. The bill was brought before the Aldermen for the approval of amendments offered by Mayor Miller, but the opponents took advantage of this situation to force a vote on a motion to file it. The fight on the measure centered on the Mayor's proposal that the city be refunded $100,000 by the St. Louis Public Service Company for a similar appropriation to be made by the city to defray the costs of the survey. Opposition to this plan was led by Walter J. G. Neun, president of the Board, who relinquished his chair to Vice-President Neumann and opened the debate on the floor. He said that he was in favor of the bill, but was opposed to the provision that the railway should defray the expenses of the survey.

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Fifteen-Cent Bus Fares Sought in Kansas City

The Kansas City Public Service Company has submitted to the City Council of Kansas City, Mo., a request for a 15-cent bus fare for the downtown buses. Up to this time that fare has been 10 cents. New bus routings were embraced in the suggestions filed with the city clerk, together with a detail report of losses under the bus operations of the last two years.

In this document Powell C. Groner, president of the company, pleads that the street car rider should not be asked to make up a deficit occasioned by those who prefer a more luxurious service downtown, with a seat guaranteed.

Twelve suggested bus routes are offered in place of the existing eleven. The Country Club Express line, formerly a 25-cent line, would be 15 cents, with ordinary instead of the present de luxe equipment. The infrequently used Blue Valley line would be discontinued, and the Leeds line developed into a crosstown line to St. John Avenue. This feeder line would have a 10-cent fare. Three distinctly new lines are proposed: a Chestnut line, an Oak Street feeder line, and a 63d Street crosstown line, all feeder lines each with a 10-cent fare. The company estimates a 10 per cent decrease in patronage on the trunk lines under the 15-cent fare.

An estimate of yearly earnings was submitted to the Council, based on halting trunk line service at 11 o'clock, and stopping service on some of the feeder lines at 8 o'clock. It is estimated that with this service there would be an annual deficit of about $140,000 as against the 1927 deficit of $210,204 and a 1926 deficit of $319,790. Mr. Groner says:

> The proposed plan would not make the bus system self-supporting. This is due to the large amount of feeder mileage. It is very doubtful if for years these feeders will pay operating costs. The substitution of bus service for railway service at the eastern end of the Fifth Street car line would eliminate the rebuilding of tracks at a cost of $77,000.

Eliminating interest on the investment, the Armour-Paseo double-deckers were the only buses to earn a profit last year, the profit being $431.

Mr. Groner concedes the new bus franchise or permit should not run for more than five years, due to the present experimental state of such services as those proposed to be rendered.

Initial North Jersey Line Plan Announced

Tentative specifications for the rapid transit line proposed to connect Newark, Paterson and Hackensack as an initial step in the development of rapid transit throughout Northern New Jersey have been announced by the North Jersey Transit Commission. They will be used in detailing costs, construction types, and rights-of-way in preparation for presenting definite recommendations for financing and construction to the State Legislature at its 1929 session. According to the announcement the plan involves a total of approximately 22.6 miles of construction in connecting the three terminal cities. Approximately 2.3 miles will be in subway, 7 miles on elevated, and 13.3 miles on grade and fill with all grade crossings eliminated.

Give and Take Proposed in Ohio City

The railway situation in Springfield, Ohio, appears to be rapidly approaching a crisis. On April 10, W. H. Sawyer, receiver of the Springfield Railway, notified the city that service on the Madison-Ludlow Avenue line would be discontinued on April 15 and that during the week cars on that line would operate on a 20-minute schedule only between the hours of 5:30 a.m. and 9:30 a.m. and from 2:30 p.m. to 6:30 p.m. The receiver declared that curtailment was necessary as part of the program to make the railway pay, if possible.

When he took over the lines, the receiver issued a statement indicating that buses would be substituted on some routes and that probably an increase in fare would be requested. The action on the Madison Avenue division is the first concrete move to be made.

City Manager Flack has declared the situation would have to be solved by "give and take." He said:

> There is no question in my mind that the railway system has too much financial overhead to bear. Even if we granted a fare increase and even if we waived payment of cost of paving between the tracks, the company would still operate at a loss. Springfield needs a transportation system, and the city must make some concessions, but we must also demand that the railway also make concessions.

The city manager pointed out that if the city refused to take any action the property would be practically valueless. In conclusion he said:

> But we must have some kind of service and I believe that some basis for adjustment can be reached.

In an effort to clarify the controversy, between Springfield and the Indiana, Columbus & Eastern Traction Company over the railway paying its share of the cost of paving two streets, city officials with J. M. Pogue, general manager of the company, will interview Federal Judge Killits to determine the attitude of the court toward permitting the utility to assume a share of the paving cost.

In one case, the Springfield Railways, operating the city lines, discontinued service on a street and tore up its track when the city sought to have it share in the paving. Railway operators hold to the view that it is unfair to require the utilities to help with the burden of paying for paving to make streets better for a competitor—the automobile. Nothing came of a proposal made recently by one of the railways to help pay if the city would ban parking in the congested district downtown.

No Purchase of Interurbans by Erie Railroad

Any ideas that may have been harbored by officials of the Erie Railroad looking toward the purchase of the Buffalo & Lockport, Lockport & Olcott and Buffalo-Niagara Falls high-speed interurban lines from the International Railway, Buffalo, are reported in newspaper dispatches from Washington to have been abandoned. The reported plan to take over the electric lines was said to be part of the proposed railway mergers in the East and Middle West involving several lines. The Erie is said to fear that any purchase of interurban electric lines by it as freight and passenger feeders would merely serve to intensify competition from motor carriers.

Governor of New York Signs "Death Avenue" Bill

Included in 99 bills signed on March 28 by Governor Smith were several important New York City measures. One is expected to pave the way for the elimination of "Death Avenue" on the west side of Manhattan. The first step toward the elimination of "Death Avenue" is expected to be brought about under Assemblyman Samuel Hofstadter's bill relating to the removal of grade crossings in New York City. Under this measure the city authorities will be able to negotiate with the New York Central Railroad for the elimination of the tracks on Eleventh Avenue and for the general improvement along the west side of New York City through which the tracks of the New York Central run.

Controversial Points Being Cleaned Up in Toledo

A new power rate for the Community Traction Company, Toledo, which will settle an issue at least four years old and result in a rebate of approximately $150,000 to the company, with the effective rate based on consumption rather than on a theoretical demand, has been agreed upon by Commissioner E. L. Graumlich and David H. Goodwillie, member of the street railway board of control, representing the city, and R. E. Burger, representing Henry L. Doherty & Company, according to the report to Mayor W. T. Jackson.

The railway will make an effort to settle the back paving claim of $185,000 and also go along with the city administration in its paving program for this summer.

On the other hand, the city will seek to pass legislation which will enable the company to control the bus operations within the city, extend lines by means of additional buses, and take over some existing lines.

The whole plan is to be worked out under the Milner ordinance with the idea of cleaning up controversial points and eliminating competition so that the railway may be operated at a profit and

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gradually work out of the deficit accumulated in the last seven years. Sinking fund charges have ceased under the terms of the ordinance.

Appraisal Expenditures Under Fire in Indiana

Alleged practice of Indiana utilities of charging to operating expenses the sums incurred by audits, appraisals and attorney fees was attacked on March 23 by the Indiana Public Service Commission with the adoption of a resolution that in the future will force such expenditures to be made from the net income and paid from the utility's own pocket.

According to Calvin McIntosh, commissioner, the resolution is the result of a hearing he conducted recently in which an increase in rates was sought. He presented figures to show that attorneys fees charged in connection with the hearing, which continued about one day, amounted to $3,000 for one firm, $750 for another and $350 for a third. In addition he said that although appraisals and audits of the property and books were made by the Public Service Commission engineers and accountants, owners of the company paid $5,000 for an appraisal to one commercial engineer and $500 to another and that $750 was paid by the company for a separate audit of the books, besides that made by the commission's accountant.

Rerouting Plan Discussed in Baltimore

Rerouting of cars of the United Railways & Electric Company, Baltimore, Md., was discussed at length at a recent meeting of the special commission appointed by Mayor Broening. The result was the appointment of Dean J. Locke, of the United, and William G. Albrecht, a member of the City Council and sponser of the suggested one-way street system, as a committee to work out the details of this part of the program for submission to the commission. The commission will report the entire one-way traffic subject to Mayor Broening and the City Council in the near future.

Jacksonville Paper Has New Growth After Seven Years

Because *Trollicar Topics* has become so popular with patrons of the Jacksonville Traction Company, Jacksonville, Fla., it has been increased in size from four to six pages. More space will now be devoted to informing the car riders of the problems of the company and other railway properties. The leaflet first appeared more than seven years ago. Since that time it has been explaining the operation of the company to its readers. Hundreds of letters have been received approving *Trollicar Topics* in its new form.

Reduced Fares on Pacific Northwest

Reductions in fares on the Pacific Northwest Traction Company, Seattle, Wash., are in effect on the routes between Seattle, Wash., and Vancouver, British Columbia, through Everett, Mount Vernon, Bellingham and Blaine, Wash., and New Westminster, British Columbia. The principal changes in fares are as follows:

Miles	Old Fares One-way	Old Fares Round-trip	New Fares One-way	New Fares Round-trip
31 Between Seattle and Everett	$0.75	$1.30	$0.75*	$1.30*
70 Between Seattle and Mount Vernon	2.15	3.30	1.35	2.50
98 Between Seattle and Bellingham	3.00	4.65	1.95	3.65
157 Between Seattle and Vancouver	4.50	8.00	3.00	5.50
39 Between Everett and Mount Vernon	1.40	2.00	.75	1.40
67 Between Everett and Bellingham	2.40	3.25	1.35	2.50
126 Between Everett and Vancouver	4.00	7.01	2.85	5.30
28 Between Bellingham and Mount Vernon	1.00	1.35	.55	1.00
59 Between Bellingham and Vancouver	2.15	3.65	1.50	2.75

* No change.

Fares reduced proportionately are in effect between other points. These fares are put in for a trial period which expires June 15, 1928.

"Skip-Stop" Service Approved By Columbus Council

Inauguration of "skip-stop" service and establishment of all railway streets as main thoroughfares have been approved by the City Council of Columbus, Ohio. Opposition to the measures was offered by Councilman Worley, who contended that the main thoroughfare clause was a scheme of the railway to seek legal immunity from accidents.

The legislation would establish "skip-stops" in all parts of the city except in the downtown district, allow cars to operate at 25 m.p.h., in the outlying districts and require all vehicles to come to a full stop before entering or crossing streets with car tracks. The present speed limit in the outlying districts is 20 m.p.h. These changes in service had been requested by C. C. Slater, president and general manager of the Columbus Railway, Power & Light Company.

Columbia Now Served by Buses

The transportation situation in Columbia, S. C., in more or less of a muddle since the cars of the Columbia Railway, Gas & Electric Company stopped running in March, 1927, bids fair to be cleared up in the near future. At the present time the city is being served by the Columbia Bus Company, a concern which has in operation nine 16-passenger Studebaker machines, with ten additional buses expected about the middle of April; also in operation are a number of unregulated 10-cent jitneys.

An ordinance has been passed by the City Council effective this month which provides that all motor vehicles operated for hire shall run on prescribed routes fixed by the City Council. A similar ordinance was passed several months ago. A jitney driver who violated it was technically placed under arrest, and the case taken direct to the State Supreme Court to determine the constitutionality of the ordinance. Since that time, however, the General Assembly of the state has met, and it passed an act which specifically gave the Columbia Council authority to regulate motor traffic on the city streets. As a result of this act the case before the Supreme Court was dismissed before a decision was handed down. It is not believed that the jitneys' union will contest this second ordinance, passed since the General Assembly passed its measure authorizing the Council to regulate motor transportation.

A municipal campaign late this month for the election of two members of the City Council is now in progress. At the various meetings the transportation situation has come in for much discussion.

Petitioners Ask for Referendum on Chicago Traction Legislation

Petitions signed by nearly 400,000 Chicago voters were filed at the election commissioners' office on April 6 asking that three questions of public policy regarding the city's railway problem be submitted to a referendum of the voters at the judicial election on June 4. Circulated under the auspices of the Amalgamated Improvement Association, these documents seek to make it compulsory upon Mayor Thompson and Governor Small of Illinois to submit all railway legislation for Chicago to the voters before it can become effective; they ask that voters be given an opportunity to determine whether the traction fund of $50,000,000 shall be used to build a "loop" subway, and also whether the city should not at once provide buses for districts now without adequate transportation.

In explaining why the petitions were filed, August Knickels, president of the association, stated that Governor Small had been in office for seven years and Mayor Thompson for nine years, during which time they have both refused to give Chicago home rule.

Richmond to Journal Editor

"Transportation in Richmond Yesterday and Today" is a feature article in the March issue of *Richmond*, by G. Watson James, Jr., Assistant Editor, ELECTRIC RAILWAY JOURNAL. In this article Mr. James tells the story of transportation from the period of mule cars to the present-day riding on de luxe cars and buses.

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Skip Stops Effective in St. Louis

Passengers on the Olive Street lines of the St. Louis Public Service Company have been saved six minutes on each trip following the installation of a skip-stop plan between Twelfth Boulevard and Channing Avenue, St. Louis, Mo. The limitation of car stops was suggested by Mr. Brooks, director of streets and sewers, to speed up the reconstruction and paving of Olive Street.

Franchise at Jacksonville Still Under Discussion

The principles involved in the proposed new citizens' committee franchise for the Jacksonville Traction Company, Jacksonville, Fla., were discussed publicly at a recent meeting of the Council. There is still disagreement on some of the major points, but the consensus of opinion is that the matter is nearer a settlement now than at any other time since the movement for a new 30-year permit was launched two years ago.

Representatives of the citizens' franchise committee, appointed by the Council to prepare a franchise, and Peter O. Knight, Tampa, general counsel for the company, discussed the proposed bill of privileges in detail. The Council finally voted unanimously to request Mr. Knight to prepare drafts of two franchises of different types that would be acceptable to his company. These drafts will be compared with citizens' committee plan for its final modification into an operating agreement that will be acceptable to both city and company.

Giles J. Patterson, local attorney, who was chairman of the citizens' committee, and George C. Bedell, attorney, spoke for the committee. Mr. Patterson opened the discussion with a review of the committee's work. He elaborated on the proposal to establish the office of city railway director, made in the drafted franchise, saying that the plan has been successful in other cities and that the sole purpose of the directorship was to give the city closer and more intelligent supervision of the company's operations and to make possible co-operation between the city and company for better service.

Mr. Knight went into considerable details concerning the simple, broad franchises granted to other utility companies in which he is interested and said that all the binding factors in a franchise may be placed on two sheets of paper. He said that all the Jacksonville company wants is "the right to live, a fair valuation of its property and a fair return on that investment." These were the only features necessary to put into a franchise, he declared.

"Above the Clatter of Wheels and the Hum of Motors"

A group of railway men attained the unusual distinction of furnishing music to the entire world on Saturday night, March 31, in a joint good-will program furnished by employees of the Cleveland Railway and the Pittsburgh Railways and broadcast through the courtesy of radio station KDKA of the Westinghouse Electric & Manufacturing Company.

The Cleveland group included a 150-voice male chorus and a male octette, both under the direction of Charles Dawe, while the Pittsburgh contingent consisted of a 50-piece band under the direction of Alois Hrabak. The groups alternated on the air from 10 until 11:30 p.m. The program was sent out from KDKA over three wave lengths, 27, 62 and 316 meters, the low wave being used especially so that the 80-year old mother of Mr. Dawe might listen to the program at her home in Wales. This also was the official night KDKA broadcasts to the Far North.

In order that the home folks might hear the program from their local station a special line was maintained from KDKA to WTAM at Cleveland and the latter station rebroadcast the program from 10 until 11 p.m.

The Cleveland men arrived in Pittsburgh by special train Saturday forenoon and were the guests of the Pittsburgh Railways at luncheon and for an inspection trip of the system during the afternoon. At 6 p.m. the combined groups arrived by special street cars at the Westinghouse plant at East Pittsburgh and were the guests at a banquet and entertainment in the officers' dining room on the eleventh floor of their new office building.

The broadcast program was opened by a word of welcome from Thomas Fitzgerald, vice-president of the Pittsburgh Railways, to Col. Joseph Alexander, president of the Cleveland Railway. Other members of Mr. Alexander's staff present were Ralph W. Emerson, vice-president; Fred Bullock, assistant to the president; Clinton D. Smith, director of personnel, and J. H. Cox, superintendent of welfare. Members of Mr. Fitzgerald's staff present were J. B. Donley, director of public relations, and T. W. Noonan, general manager of the Pittsburgh Motor Coach Company.

Through a special set-up the broadcast of this exceptionally large group was made direct from the Westinghouse officers' dining room.

A glimpse of those who made March 31 a gala event

Paving Charges in Ogdensburg to Be Settled

Governor Smith has signed the Thayer bill, as chapter 577 of the laws of 1928, authorizing the city of Ogdensburg, N. Y., to enter into an agreement with the Ogdensburg Street Railway compromising, adjusting and settling all differences between the city and the railway for paving charges due the city.

Over the Waves With Williams on WJAR

Five minute talks are broadcast to the people of Rhode Island every Friday evening from station WJAR, Providence, by Alonzo R. Williams, general manager of the United Electric Railways, Providence, R. I., a shrewd observer of men and events, a wit and an unusually versatile forensic orator.

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Recent Bus Developments

New Installation in Quincy On April 1

The Illinois Power & Light Company instituted bus service April 1 on the North Fifth Street line in Quincy, Ill., supplanting cars which have operated on that route 61 years. Bus service was also established from Tenth and Cherry Streets to the Soldiers' Home. The North Fifth Street line was the oldest car line in Quincy, the first section being built in 1867 when the Illinois Legislature awarded an exclusive privilege for operating horse-drawn cars over the street, giving a 50-year charter. Six new Yellow coaches have been installed for operation on the substitute service, each with 21-passenger capacity.

Would Consolidate Service in Section of Pennsylvania

The applications of the Johnstown Traction Company, Johnstown, Pa., for the right to purchase the controlling stock of the Southern Cambria Railway was heard by the Public Service Commission on April 5 without protest. It was brought out in the testimony that the purpose of the consolidation was to co-ordinate the railway and the bus service operated by the two companies in that section of the state.

Files Protest Before Missouri Commission

D. L. Fennell, general superintendent of transportation of the Kansas City Public Service Company, has filed a protest with the Missouri Public Service Commission against the operation of proposed bus service connecting Kansas City, Independence and Odessa, by the Chicago & Alton Railroad.

He said his company had no objection to the railroad operating a bus line to Odessa as long as it did not carry passengers to Independence or from Independence to Kansas City. The steam railroad officials assert that the proposed service between the two cities has been necessitated as a matter of self-preservation against competing bus carriers.

Terms of New Louisville Grant

Twenty-year grant awarded to Louisville Railway. Initial fare 10 cents. Provisions of grant reproduced in detail

EXCEPT for the preamble the following are the terms of the franchise for the operation of buses in Louisville, Ky., awarded recently to the Louisville Railway following its successful bid for the grant:

SECTION 2—FRANCHISE CREATED

There is hereby created and established a franchise or privilege to operate gasoline buses, or other automotive vehicles, for the carriage of passengers for hire upon and over all the streets and highways of Louisville upon the terms and conditions hereinafter set out.

SECTION 3—OPERATING RESTRICTIONS

The enjoyment of the franchise grant hereby created shall be subject to the following conditions:

1. All operations hereunder shall be conducted according to established schedules over regular routes and between fixed termini;

2. Any route within the limits of this grant may be established, modified, discontinued, or re-established with the consent of the Board of Public Works of Louisville; but not otherwise;

3. The said Board may require the discontinuance of any route established hereunder;

4. The said board shall have power to require the establishment and operation by the holder hereof of such transportation routes upon any of the streets of Louisville, and to require such additional service upon any established route or routes, or modification thereof, as may be reasonably necessary to furnish adequate and a complete transportation service, provided, however, that said board shall first make, or cause to be made by such city agencies as it may designate, a survey of each proposed route or additional or modified service, which survey shall include a report on the patronage to be expected, the desirability of and the reasonable necessity, if any, for such new route or routes, or additional or modified service;

5. If it shall be held by any court of last resort, having jurisdiction, that any of the said powers hereunder enumerated may not lawfully be vested in and exercised by the Board of Public Works, then such of said powers shall be vested in and exercised by the legislative department of the city of Louisville, it being the intent and purpose of this ordinance that all of said powers to be exercised hereunder by the city of Louisville shall be vested in and be exercised by whatever department of the government of the city of Louisville may lawfully exercise the same.

SECTION 4—DURATION OF FRANCHISE

The said franchise or privilege shall continue for a period of twenty years from and after the approval of this Ordinance.

SECTION 5—RATE OF FARES

The holder of this franchise may charge and collect toll during the first year of operation hereunder at a rate not exceeding 10 cents for each passenger carried within the city limits, with free transfers between bus lines in the making of a single continuous trip. Transportation of school children shall be furnished at one-half fare and to policemen, firemen and park guards, when in uniform, free.

Provided, first, that if this franchise be acquired by a person or corporation operating, in Louisville, a system of electrically propelled street cars running on rails, or by a subsidiary of such corporation, then such person or corporation shall furnish free and reduced fare transportation hereinbefore set out and in addition shall give and receive transfers for the making of a single continuous trip within the city limits upon terms as follows: From bus line to bus line, and from bus line to electric car line, free; and from electric car line to bus line for not more than the differential between electric car fare and bus fare. The bus fare for the first year of operation shall not exceed 10 cents, and shall thereafter be controlled in the same manner and upon the same principles as the electric car fare, and

Provided, secondly, that by whomsoever the franchise may be acquired, in the adjustment of bus fare, electric car fare and/or transfer rules and charges, the rate or rates for service shall be such as to yield to the holder hereof a reasonable return upon the fair value of its entire and combined properties used and useful, employed in its city transportation service.

SECTION 6—ASSIGNABILITY OF FRANCHISE

The holder of this franchise shall not sell or assign the same to any person or company engaged in competitive transportation, or about to engage in competitive transportation, in the city of Louisville, provided, that nothing herein shall prevent the said holder from mortgaging such franchise in connection with its other properties and rights.

SECTION 7—BOND

The purchaser or assignee of this franchise shall within 30 days of its acquisition, as approved by the General Council, deposit and maintain throughout the term of operation hereunder, with the Board of Public Works, a bond with corporate surety approved by said board, in the sum of $100,000 running to the city of Louisville, conditioned as follows:

1. That the holder shall fulfill the obligations of this franchise during its entire life:

2. That in the event of any injury or damage to any person or property growing out of any negligence in the operation of the motor vehicles used by the franchise holder in the business herein, provided for, the person so injured in his person or property shall have a right of action thereon:

3. That said applicant will pay to the city of Louisville all sums due said city for any license, tax, or other liability, including all fines, and forfeitures assessed against such franchise holder by the final judgment of any court, and also to indemnify the city against any loss or damage for accidents arising out of negligence in the operation of such motor vehicles:

4. That said bond shall not be void upon first recovery, but may be sued on and recovery had until the full sum thereof is exhausted;

Provided: Should the holder of this franchise fail within 30 days from its acquisition to give bond, as in this section provided, or fail to make good any impairment in such bond within 30 days of such impairment, such failure in and of itself shall render this franchise void and of no effect, and no act or omission on the part of the city shall constitute a waiver. Approval by the Board of Public Works of bond of any holder hereof shall release all prior bonds except as to liabilities then outstanding against said prior bonds, or any of them.

SECTION 8—ADVERTISEMENT
SECTION 9—UPSET BID

In the sale of this franchise the Board of Public Works shall offer the same at an upset bid of $5,000.

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SECTION 10—PAYMENT AND DEPOSIT OF CERTIFIED CHECK

The bidder to whom such franchise or privilege shall be awarded shall pay the amount of such bid in cash to the treasurer of the said city within ten days after the same shall have been approved by the General Council, and no bid shall be received or considered by the said Board of Public Works unless such bidder shall deposit with his bid a check, payable to the treasurer of the said city, for the sum of Five Thousand ($5,000.00) Dollars, and which shall have been duly certified by a bank established and doing regular business in the city of Louisville, and which sum of money shall be treated as part of payment by the successful bidder, in case he shall comply with his bid; and if he shall not, it shall be treated and retained as liquidated damages due to the said city. Checks deposited by unsuccessful bidders shall be at once returned to them respectively.

SECTION 11—SUPERVISING DUTIES OF BOARD OF PUBLIC WORKS

The Board of Public Works shall perform the duties herein imposed upon it of supervising the management of the operations of the holder hereof. To enable the said board to perform such supervisory duties, such technical and engineering force, auditors, accountants, inspectors and clerks may be employed as the General Council may, by ordinance, from time to time authorize; the said appointees and assistants to be named by the Mayor by and with the approval of the General Council.

SECTION 12—ACCOUNTS AND ACCOUNTING RECORDS

The Board of Public Works, or such other person or persons as may be authorized or delegated by said board or said city, shall have access to all books, records, correspondence, files, engineering studies, data and all other recorded information of any kind or character whatsoever kept by the holder of this franchise, however and in any way relating to the affairs of the said holder, past, present or future, and refusal to permit such access shall bring said company in default under the penalty clause hereinafter set out.

The accounts of the said holder shall be kept in accordance with the uniform classifications of accounts for Class A bus companies as from time to time prescribed and promulgated by the National Association of Railroads and Utilities Commissioners, unless the Board of Public Works shall from time to time agree with the said holder to modify such system of accounting.

Under the system of accounting then in force, the said holder shall render to the Board of Public Works complete monthly statements in writing.

SECTION 13—PENALTY CLAUSE

In the event the holder of this franchise knowingly fails or refuses to abide by the terms of this ordinance, or any one or more of them, or the terms of any ordinance or resolution passed pursuant to the provisions of this ordinance, it shall be subject to a fine of not less than $50 nor more than $100 for each offense, and each day's failure or refusal shall constitute a separate offense.

Whenever any penalty is imposed under this section, same shall be paid by the said holder out of corporate funds, and shall not be charged as an operating expense.

Nothing in the ordinance shall be deemed to barter away or to impair the police or rate-making powers of the city of Louisville, but on the other hand, the city expressly retains these powers free and unimpaired. The General Council shall exercise free and unimpaired its police powers in respect of the kind and character of service to be rendered under this franchise.

The sale of the franchise to the railway company has been approved by the Council.

The Louisville Railway has 30 buses ready to place in service under the new bus franchise, but for the present will require only 20 of them.

James P. Barnes, president of the railway, has announced a new fast light-freight service between Louisville and Lexington. Buses of the company will carry freight from end of the electric line of the company at Shelbyville to the beginning of the electric line operating between Frankfort and Lexington.

Hearing on Interstate Bill

Various interests advocate passage of regulatory measure declared to represent joint views of state commissions and of operators

REPRESENTATIVES of bus operators and of state public utilities commissioners testified on April 10 at a hearing before the House Committee on Interstate and Foreign Commerce, in support of the bill (H. R. 12380) introduced by Representative Parker, of New York, chairman of the committee, to provide a system of federal regulation of interstate operations of motor vehicles carrying passengers as common carriers.

S. A. Markel, chairman of the legislative commmittee of the bus division, American Automobile Association, and John E. Benton, of Washington, general solicitor, National Association of Railroad and Utilities Commissioners, explained that the Parker bill represents a much simplified and shortened redraft of the earlier Parker bill, on which they and other organizations interested had collaborated, and that it had been presented in an effort to obtain legislation at this session.

The new bill does not apply to truck operations. Mr. Benton attributed the origin of the new bill largely to Mr. Markel's organization, although he said it had been generally approved by others, and that his association, through its officers and committees, had expressed approval, as far as the bill goes, without changing their attitude represented in the earlier bill.

Counsel for the American Railway Association and the American Short Line Railroad Association, representing the steam railroads, and of the American Electric Railway Association, also were present to give their views.

Mr. Markel said that at conferences between those he represented and the public utilities commissioners and railway interests, it was agreed that the bill is in the public interest, although bus owners were not unanimous in approving all the terms of the bill. He explained that the bill would provide for actual regulation to be administered in the first instance by joint boards of state commissioners, which appeal to the Interstate Commerce Commission.

Mr. Markel said that 44 states have regulatory laws governing intrastate operations of motor vehicles and that the bus operators have confidence in the state commissions. The language of the bill he said follows state regulatory procedure as far as possible. An attempt has been made to simplify the bill by leaving the machinery of regulation as far as possible to the commissions. The bill is not intended to cover "contract carriers," such as sightseeing buses that make contracts with parties for special trips.

Mr. Benton said the organization of the state commissioners had been interested in legislation of this character ever since March, 1925, when the Supreme Court of the United States held that no state could restrain operations of vehicles in interstate commerce, which left about 10 per cent of the motor traffic beyond the state jurisdiction.

F. T. Singleton, chairman of the Public Service Commission of Indiana, made a brief statement, saying Indiana is especially interested in the bill because much motor traffic passes through that state.

Representative Wolverton said that an intolerable situation had been created as the result of the great increase in the volume of interstate passenger bus traffic over the bridge between Philadelphia and Camden, which now amounts to over 280 buses a day, and that the New Jersey municipalities are greatly handicapped by lack of power to regulate interstate operations. He therefore urged that action be taken at this session if at all possible.

Rehearing Granted in Staten Island Case

A rehearing will be held on April 23 by the New York State Transit Commission on the application of the Tompkins Bus Corporation for certificates of convenience and necessity for the operation of buses on eighteen routes in the Borough of Richmond (Staten Island) specified in the contract of franchise between the city of New York and the bus company dated Aug. 4, 1927. The grounds on which the commission acted in its previous refusal to approve the appeal of the company were reviewed in the ELECTRIC RAILWAY JOURNAL for March 10, page 416. Any action the state body may take in the matter is regarded as important since it may be considered as defining the attitude of that body as contrasted with that of the city in the matter of passing on the competency of operators seeking bus rights that might result in competition with existing carriers.

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Financial and Corporate

Cortland County Traction Sought by Power Interests

Application has been made to the Public Service Commission of New York State by the Mohawk Hudson Power Corporation for consent to acquire more than 10 per cent of the capital stock of the Cortland County Traction Company, Cortland, N. Y., which operates 18 miles of electric railway, runs bus routes and does a lighting and power business. The capital stock of the Cortland Company consists of 3,200 shares, par value $100.

The petition of the Mohawk Hudson Company states that an agreement has been reached between all the owners of capital stock of the Cortland Company and the Mohawk Hudson Company for exchange of the stock of the Cortland Company for certain stock of the Mohawk Hudson Company on the following basis:

For each share of the capital stock of the Cortland County Traction Company one share of the preferred stock of the Mohawk Hudson Company, 2½ shares of the second preferred stock and six shares of the common stock. The shares to be exchanged are without par value. The preferred stock is entitled to cumulative dividends at the rate of $7 a share per annum and the second preferred stock at the rate of $7 per annum after payment of dividends on the preferred stock.

Sale of Equipment Trust Stock Approved

A compromise sale price of $45 net on preferred stock of the Indianapolis & Cincinnati Car Trust Equipment Company is reported to have been agreed on between a stockholders' committee and representatives of the Indianapolis & Cincinnati Traction Company. The agreement will permit Charles T. DeHore and L. E. Eastman, prospective owners, to proceed to improve the road and possibly extend it.

Terms of the agreement have received the approval of Judge Robert C. Baltzell in federal court to the extent that the receivership action will be continued while the plan is being worked out. Letters are to be mailed shortly to holders of the equipment company's series A preferred stock inviting them to deposit their stock with the Fletcher Savings & Trust Company, Indianapolis, for sale to the DeHore and Eastman interests.

Before the compromise, DeHore and Eastman, it was reported, had offered stockholders $33.50 a share, or one third of the face value of the securities. This offer has stood for some weeks, with the representatives of the interurban asserting they would provide the road with entirely new equipment rather than pay more for the stock.

Members of the stockholders' committee said the price of $45 net to be paid under the agreement was more than they might hope to realize if the equipment being used on the lines was withdrawn and sold at its depreciated value. In this instance the equipment trust was somewhat unusual in that it covered rolling stock and certain power installations pledged some years ago when the road changed from single-phase to high-voltage direct current.

Buffalo Company Certifies Change in Capital

The International Railway, Buffalo, N. Y., has notified the Secretary of State of an increase in authorized capital stock to 195,000 shares from 175,000 shares. New capital will consist of 20,000 shares of $100 par preferred stock and 175,000 shares of no par common stock. Present authorized capital consists of 175,000 shares of $100 par capital stock. The change which has now been certified to the state has been the subject of extended comment in previous issues of the ELECTRIC RAILWAY JOURNAL.

Net Income Increases

Trustees of the Eastern Massachusetts Street Railway report an increase of $37,222 in net income of company. Operating expenses decreased. Company active in promotion of new business

THERE was a decrease of $162,601 in revenue from all sources of the Eastern Massachusetts Street Railway, Boston, Mass., in 1927, compared with 1926. The net income available for dividends in that year was $772,060, an increase over 1926 of $37,222. This fact was disclosed in the annual report of the company's trustees for the year ended Dec. 31, 1927. Unfavorable weather conditions were almost entirely responsible for the large decrease in revenue. The railways revenue would have shown a greater decrease except for an active campaign to promote more business by the introduction of a dollar Sunday and holiday ticket in July, 1927, and the addition during the summer of 50 new de luxe light-weight cars. The cost of the 50 new cars was $778,000. During the year 241 cars were reconditioned and 537 cars repainted.

Total passenger miles operated in 1927 were 17,912,322, as compared with 17,731,483 in 1926.

The cost of operation before taxes, interest, and rental charges was $169,412 less in 1927 than in 1926. The reduction in expenses would have been greater except for an increase in wages of 1½ cents an hour, effective May 2, 1927, under an agreement with the union. The actual expenditures for maintaining passenger cars were $514,845, compared with $422,585 in 1926. The activities of the rolling stock department in 1927 were devoted mostly to improvement of passenger car equipment. The work in this department and the increased rate of wage are the real causes of the larger operating expense. There was an increase in the cost of group insurance due to the employment of a larger number of men under the enforced change from the nine-hour day to the eight-hour day.

During the year the company rebuilt 14.5 miles of track, of which 9.7 miles were in paved streets. As a result of the continued intensive supervision and improvement on rails, derailments due to defects in the track during 1927 were only one-fourth of those in 1922, and were 22 per cent less than in 1926.

On the subject of bus operation, the report said that 1,435,817 bus-miles were operated in 1927, an increase of 148,650 over 1926. All of the bus lines operated in 1926 were continued in 1927, and in addition a bus line was started between Lowell and Lawrence by a new route south of the Merrimac River. This line replaces a local trolley line in Lowell, and also serves new territories in Tewksbury and Andover. Bus revenues for the entire system increased $60,058, and expenses increased $15,697. During the year the company failed, however, to earn bus operating expenses and depreciation, not including taxes and interest, by $24,900, compared with a loss of $62,207 in 1926. Ten motor coaches were purchased at a cost of $89,290. At the present time the bus investment is $538,482. The buses are operated in 26 towns and cities. To aid in snow fighting on bus lines, three caterpillar snow plows were purchased during the year at a cost of $14,100. There are now 23 bus snow-fighting units on the system.

Dividend payments amounting to $866,201 were made in 1927 as follows:

First preferred	$248,013
Sinking fund	1,260
Preferred B	181,368
Adjustment	435,560
	$866,201

Under the group insurance and pension plan, insurance policies aggregating $40,700 in eighteen death cases, and monthly allowances to pensioners were paid during the year aggregating $22,242. Twenty-seven other employees are receiving monthly payments under the total disability clause of the insurance plan. Six new pensioners were added in 1927 and four died. The total is now 39.

On the first preferred and sinking fund stocks, payments of 3 per cent were made on Feb. 15 and Aug. 15. On preferred B, payments of 3 per cent were made on Feb. 1 and Aug. 1. On adjust-

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COMBINED INCOME STATEMENT OF ALL DISTRICTS OF EASTERN MASSACHUSETTS STREET RAILWAY

	1927	1926
Street car revenue	$8,472,602	$8,699,914
Auto bus revenue	381,375	321,317
Express and other revenue	36,773	41,879
Rentals and advertising	190,171	198,051
From sale of power	262,275	272,527
Interest and other income	282,238	254,347
Total revenue	$9,625,434	$9,788,035
Expenses:		
Way and structures	$1,221,227	$1,229,616
Equipment	1,240,498	1,230,046
Power	1,270,720	1,281,790
Car operation	2,249,449	2,378,475
Injuries and damages	252,050	262,166
Insurance	73,003	73,810
Law expenses	15,217	40,255
Rent of tracks	82,382	80,167
General wages and expenses	241,583	235,724
Pensions	22,242	23,045
Group insurance	69,314	64,866
Stationery and printing	33,917	37,201
Stores and garage expenses	56,652	53,299
Miscellaneous expenses	45,307	68,210
Auto bus expenses	399,221	383,524
Total operating expenses	$7,272,782	$7,442,194
Total operating expenses and taxes	$7,631,676	$7,807,332
Gross income	1,993,758	1,980,703
Interest and rentals	1,221,698	1,245,865
Net income	$772,060	$734,838

Operating expenses include charges for depreciation amounting to $848,467 in 1927 and $917,940 in 1926. During the year 1927, $616,463 of the depreciation reserve was applied to reconstruction and amortization.

ment stock, payments of 2½ per cent were made on April 1 and Oct. 1.

Bonded obligations of the company were retired and paid at maturity as follows: $129,000 Bay State equipment 6's due Aug. 1, 1927; $300,000 Eastern Massachusetts series A 6's due Jan. 1, 1928; $105,000 Eastern Massachusetts series C 6's due Feb. 1, 1927; $107,400 Eastern Massachusetts series C 6's due Sept. 15, 1927; and $64,000 Peoples Street Railway 5's due Jan. 1, 1928.

The final serial payment of $129,000 of Bay State equipment 6's was made on Aug. 1, 1927. These ten-year serial 6 per cent gold notes were issued by the Bay State Street Railway on Aug. 1, 1917, to cover in part the cost of 200 Laconia semi-convertible cars, on which a cash payment of $323,000 was made at the time of the purchase, the total cost being $1,631,000, and the original issue of notes $1,308,000, of which the unpaid principal amounting to $1,177,000 was assumed by the Eastern Massachusetts Street Railway at the time of the reorganization.

Items showing decreases in revenue were:

Street car revenue	$227,312
Express and other revenue	5,106
Rentals and advertising	7,880
Sale of power	10,252

Items showing revenue increases were:

Auto bus revenue	$60,058
Interest and other income	27,891

Principal increases in expenses were:

Equipment	$10,452
Rent of tracks	2,215
General wages and expenses	5,859
Group insurance	4,448
Stores and garage expenses	3,353

Principal decreases in expenses were:

Way and structures	$8,389
Power	11,070
Car operation	129,036
Injuries and damages	10,016
Law expenses	25,038
Stationery and printing	3,284
Miscellaneous	22,903

J. F. Collins Made Receiver of Detroit-Jackson Line

John F. Collins, vice-president and general manager of the Michigan Electric Railway Lines, Jackson, Mich., has been appointed receiver for the Detroit, Jackson & Chicago Railway, succeeding A. L. Drum. The company he will now direct operates the interurban line connecting Jackson, Ann Arbor and Detroit.

The Jackson-Detroit line certainly would appear to be more naturally a part of the Michigan Electric Railway system than the Detroit United Railway group with which it has been connected in the past. Under his new receivership, Mr. Collins contemplates operating through passenger cars from Kalamazoo to Detroit without transfer at Jackson. Other improvements in through service probably will be instituted as a result of the new arrangement.

Receiver in Charge of Puget Sound Electric Railway

The Puget Sound Electric Railway, Tacoma, Wash., is now under the direct operation of Scott Z. Henderson, local attorney, as receiver, as a result of a cancelation of the contract of Stone & Webster, Inc., Boston, effected recently under authorization of Judge Edward E. Cushman of the United States District Court. The petition for cancellation was filed in the court by the receiver. No immediate changes in the road organization will be made.

The interurban line went into receivership on Feb 21 this year, and until now its affairs have been administered by Stone & Webster, its operating managers for the last 25 years. The action in no way affects the control and operation of the Tacoma Railway & Power Company, owned by the Puget Sound electric road, this remaining in the hands of the Boston corporation.

The circumstances surrounding the affairs of the Puget Sound Electric Railway were reviewed at length in ELECTRIC RAILWAY JOURNAL for July 30, 1927, page 209.

New Member Elected

At the recent directors' meeting of the Philadelphia & Western Railway, Norristown, Pa., Archie D. Swift was elected an additional member of the executive committee.

Bondholders of New York Interurban Ready to Act

Holders of the first mortgage 5 per cent gold bonds of the Syracuse, Lake Shore & Northern Railroad, Syracuse, N. Y., due May 1, 1947, are advised that the protective committee now has a majority of the bonds of the company and is about ready to take possession of the road for the bondholders through foreclosure proceedings. Those who have not yet deposited their bonds are urged to do so at once.

In 1927 the road showed earnings of $44,933 before bond interest requirements, but after depreciation of $16,266 and after taxes.

The bondholders are urged to exercise their right to take over the road since there is apparently a definite earning power in the main property. The committee says that it "desires to accomplish the best results possible for all of the bondholders and thinks that it will be to your best advantage to deposit your bonds with it and participate in a reorganization of the property rather than merely to take your proportionate share of the price which may be bid for the property upon a foreclosure sale."

$1,372 Net Income in Detroit in February

In presenting the financial statement of the Department of Street Railways of Detroit, Mich., for February, 1928, and for the year ended Feb. 29, 1928, William M. Hauser, auditor for the department, included a statement officially presented to the administrative officers of the city of Detroit, in part to show the position of the auditor and also to make it clear that the accounts of the department have been kept in accordance with scientific practice.

The balance of net income for the month of February, 1928, is $1,372 after the payment of sinking fund charges. This shows a decrease of $42,017 compared with a similar month in 1927. The semi-annual interest payment on certain of the construction bonds was made on Feb. 15, 1928, in the amount of $55,000. At the end of the month $173,224 was paid covering the 23rd quarterly interest payment in the unpaid balance of the purchase contract with the Detroit United Railway. This brings the total amount so paid out for interest under the terms of the contract to March 1, 1928, to $5,005,015. Not one cent of this money has been contributed by the taxpayer, it is pointed out by the auditor. It has all come out of the rate of fare.

The auditor refers to a report by Price, Waterhouse & Company, dated Nov. 29, 1927, with respect to the audit of the accounts of the Detroit Street Railways for the year ended June 30, 1927, in which it is stated "as pointed out in our previous reports it is to be regretted that a more specific statement as to what was to be contained in the expression 'fixed charges' was not set forth in the charter, especially with regard to the element of depreciation. From an accounting standpoint depreciation is generally considered as a fixed charge, so that from the standpoint the city charter requires that the rate of fare shall be sufficient to cover both the elements of debt requirement and depreciation."

The auditor of the department does not agree with the standpoint taken by Price, Waterhouse & Company in several respects and suggests that on account of the different views with respect to depreciation it would seem that the corporation counsel should be asked to give an opinion as to just what is meant

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by the section in the city charter under fixed charges. The auditor states that if this opinion is given it will clear up the much-discussed difference in the reports, namely $1,283,159, which Price, Waterhouse & Company, claim has not been provided for in the accounts of the department for the year ended June 30, 1927.

Under date of Feb. 21, 1928, or practically eight months after the close of the fiscal year ended June 30, 1927, the auditor received from Price, Waterhouse & Company, so-called audit adjustments in connection with the accounts of the department at June 30, 1927. The auditor states that he is now engaged in auditing and checking these adjustment items.

Quebec Company Reported in Deal

Shareholders of the Quebec Railway, Light, Heat & Power Company have approved the sale of the company as a going concern to the Quebec Power Company. The price obtained is sufficient to discharge all outstanding obligations of the company, including principal, interest and redemption premium of outstanding bonds, including all outstanding bonds of Quebec-Jacques Cartier Electric Company, the properties and assets of which are to be taken over by Quebec Railway, with the purchase price sufficient to enable the company on liquidation to pay to all holders of the company's outstanding common shares a sum of $80 in cash.

Homestead Line Bought by Pittsburgh Railways

Purchase of the Homestead & Mifflin Street Railway, Homestead, Pa., has been made by the Pittsburgh Railways. The lines were taken over April 1. They include 3¼ miles of track, overhead lines, and eleven street cars.

The new owner of the line has filed with the Public Service Commission a petition asking permission to charge the usual rate of fare, 10 cents, with three checks for a quarter, in addition to granting transfer privileges which patrons of the line do not have at present. The present fares will remain until the commission renders its decision.

$126,014 Available on Petaluma Line for All Changes

The Petaluma & Santa Rosa Railroad, operating in Petaluma to Sebastopol and Santa Rosa, Cal., reports to the Railroad Commission its 1927 operating revenue at $561,474, compared with $579,119 for 1926. Operating expenses, excluding taxes for 1927, are $417,212, and $426,257 for 1926, leaving net operating revenue of $144,261 for 1927, and $152,861 for 1926. During 1927 taxes charged to operation amounted to $32,746, and for 1926 to $34,394. Deducting the taxes leaves operating income of $111,514 for 1927, and $118,466 for 1926. Adding to the operating income, the non-operating income of the company and deducting non-collectible revenue and rents, results in a gross corporate income (which represents the amount available for interest, amortization of debt discount, other fixed charges, non-operating expenses, dividends and surplus) of $126,014 for 1927, and $125,607 for 1926.

Penn-Ohio and Northern Ohio in Deal

A special meeting of Penn-Ohio Edison stockholders has been called for May 1 to ratify an exchange offer to stockholders of the Northern Ohio Power Company, according to which two-thirds of a share of Penn-Ohio Edison common stock plus an option for an additional one-third share will be issued in exchange for each share of Northern Ohio Power common stock. The options will entitle the holder to purchase Penn-Ohio Edison common at a rate of $50 a share until Dec. 31, 1928, at $55 in 1929, and at $60 thereafter until Nov. 1, 1935.

The Northern Ohio Power Company owns more than 99 per cent of the common stock of the Northern Ohio Power & Light Company, which has assets in excess of $55,000,000 and operates electric light and power properties in Akron, Canton and Massillon, Ohio, and electric railways and bus systems in northern Ohio with trackage entrance rights into Cleveland.

The Penn-Ohio Edison Company controls a group of companies supplying the entire electric light and power, street and interurban railway business in eastern Ohio and western Pennsylvania.

$258,158 Net in San Francisco

This figure was carried to surplus of the Market Street Railway after 1927 operation. Many improvements in effect and accidents reduced. Funded debt being reduced steadily

TOTAL operating revenue of the Market Street Railway, San Francisco, Cal., was $9,819,570 for the year 1927, a decrease of $72,097 compared with 1926. The decline in passenger receipts was due to unemployment, increased use of automobiles, and particularly to easier egress from the city on account of increased ferry service, especially noticeable during the week-ends. For the greater part of the year the number of unemployed approximated 30,000, as the result of reduction in building and manufacturing activities. This explanation was made in the annual report of the company.

Operating expenses, including taxes, were $8,245,858, an increase of $226,764 over 1926, due to an increase in wages of employees, to better maintenance of equipment and to increased cost of efforts to obtain new business. The wage increase became effective March 1, 1926, and consequently, for purposes of comparison, the first two months of this expense for that year were correspondingly larger than the similar two months of the preceding year.

The net operating revenue was $1,573,712, while the sum of $258,158—after allowance of $500,000 for depreciation reserve—was carried to surplus, making a total of $3,426,793 for this account as of Dec. 31, 1927. The funded debt of the company in the hands of the public was reduced from $11,695,000 to $11,001,500, a decrease of $693,500, which amount represents bonds acquired for the sinking fund and treasury. The sinking fund provision in the trust indenture securing the bonds requires that $500,000 be deposited with the trustee annually at the rate of $125,000 quarterly. These funds are used to purchase bonds and, when so acquired by the sinking fund, such bonds remain alive and continue to draw interest for the retirement of additional bonds.

The sum of $671,390 was expended for the maintenance of ways and structures, and $691,269 for the maintenance of equipment. A new line was opened and an additional bus line was established. As a means of increasing traffic on Sundays the Sunday Pass system was installed Oct. 30, selling at 20 cents for unlimited rides for the day.

Education of the public, through the children, to the efforts of the company to improve service in every way has been given much consideration. A special "Comfort Car" (formerly the president's car) was dedicated to school and other deserving children and put into service with a view of

OPERATING STATISTICS OF THE MARKET STREET RAILWAY FOR THE YEAR ENDED DEC. 31, 1927

Passengers carried:	
Cash fares 5 cents each	192,792,769
Special car passengers	14,750
School and other tickets, 2½ cents each	3,721,267
Other tickets 5 cents each	27,211
Total revenue passengers	196,555,997
Free transfer passengers	67,111,448
Total revenue and transfer passengers	263,667,445
Free passes	518,073
Total passengers	264,185,518
Percentage of transfer passengers to revenue passengers	34.14
Passenger revenue per revenue and transfer passenger in cents	3.72
Car-hours	2,978,282
Car-miles	26,666,192
Miles of single track operated	270.59
Miles single track leased	17.59
Miles of single track owned	253.69
Number of passenger cars owned	776
PERCENTAGE OF OPERATING REVENUE	
Operating expense	77.81
Taxes (railway only)	6.16
Operating expense and taxes	83.97
Operating income	16.03
Non-operating income	.42
Gross income	16.45
Deductions from income	13.81
Net income	2.64

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REPORT OF MARKET STREET RAILWAY FOR THE YEAR ENDED DEC. 31, 1927

Operating revenues:		
Passenger	$9,740,296	
Other	79,274	
Total		$9,819,570
Operating expenses and taxes:		
Operating expenses:		
Maintenance of way and structures	$671,390	
Maintenance of equipment	691,269	
Power	1,360,576	
Transportation and traffic	3,979,313	
General and miscellaneous	938,310	
Total	$7,640,858	
Taxes	605,000	
Total		8,245,858
Net operating revenue before provision for depreciation		$1,573,712
Other income credits:		
Interest	$23,680	
Other	17,201	
Total		40,881
Gross income		$1,614,593
Income charges:		
Interest on funded debt	$790,534	
Discount on funded debt	50,611	
Depreciation of railroads and properties	500,000	
Other	15,290	
Total		1,356,435
Net income for the year		$258,158
Surplus, Jan. 1, 1927		3,220,041
Profit and loss credit—cancellation of provision for 1926 federal income tax		74,424
Gross surplus		$3,552,623
Profit and loss charges:		
Net adjustment of discount on funded debt on bonds retired	$27,731	
Management services applicable to prior period	95,833	
Miscellaneous	2,264	
Total		$125,830
Surplus Dec. 31, 1927		$3,426,793

acquainting them with the details of street car operation and the mechanical features involved.

Twenty-six electric comfort cars of the latest improved pattern were built at the company's shops during the year. Considerable overhauling, rebuilding, remodeling and repainting jobs were accomplished. These many improvements, with others made in rolling stock, elicited much favorable comment from the public. The work of track improvement was continued, 0.467 mile of electric track (single track measurement) having been built and 6.667 miles of electric track rebuilt.

While the number of autos registered in San Francisco increased in 1927 over the year previous from 128,240 to 135,729, there has been a reduction in the number of accidents occurring during the year. The installation of "white fronts" upon the company's cars, has been an effective means of preventing collisions.

Discontinuance of Iowa Interurban

The Iowa Railway & Light Company has been authorized to discontinue its interurban line between Lisbon and Cedar Rapids, Iowa. By Aug. 1 the line will be dismantled according to Sutherland Dows, manager. Tracks in Mount Vernon will not be torn up.

Delaware & Hudson Subsidiaries Report

Operating revenues of the United Traction Company, Albany, N. Y., from all sources, during 1927, were $2,738,184; operating expenses $2,303,852; and taxes $172,500. Operating income was $261,832 compared with $349,515 in 1926, a decrease of $87,683. Operating revenues decreased $195,338, or 7 per cent, compared with the preceding year. Operating expenses decreased $67,055, or 3 per cent, and taxes decreased $40,600, or 19 per cent.

Among the items of decreased operating expenses were: maintenance of roadway, power plant, and substation structures, $3,415; cost of removing snow and ice, $27,564; cleaning and sanding tracks, $6,956; maintaining equipment (other than depreciation and retirements), $31,641; transportation expenses, $64,572; and injuries and damages (including public liability insurance), $46,382. These decreases were partly offset by increases in track and roadway labor, $18,135; track and roadway materials, $12,868; paving, $39,439; maintenance of electric distribution and transmission systems (other than structures), $1,929; depreciation of equipment, $1,094; equipment retirements, $21,438; power purchased, $4,501; and general and miscellaneous expenses, excluding injuries and damages and public liability insurance, $14,241.

Effective on July 1, 1927, the Public Service Commission authorized an increase in fare from 7 cents to 10 cents cash, with thirteen tokens for $1 (50 cents for school children).

Operating revenues of the Hudson Valley Railway during 1927 were $620,849; operating expenses $791,530; and taxes $46,500. There was an operating deficit of $217,181 for the year, comparable with a deficit of $64,759 in 1926. Operating revenues decreased $152,550, or 20 per cent, below the preceding year; operating expenses increased $4,222, or half of 1 per cent; and taxes decreased $4,350, or 9 per cent.

Effective on Dec. 31, 1927, the Public Service Commission authorized the abandonment of branch lines between Thomson and Greenwich and between Lake George and Warrensburg. Application has been made to the Public Service Commission for permission to abandon the line between Stillwater and Fort Edward, and depot line, belt line, and South and Knight Streets line in Glens Falls.

Operating revenues of the Capitol District Transportation Company, Inc., the bus operating subsidiary of the United Traction Company in Albany and vicinity, during 1927, were $583,708; operating expenses $583,856; and taxes $5,000. There was an operating deficit of $5,148 for the year, comparable with a deficit of $52,291 in 1926. Operating revenues increased $280,057, or 92 per cent; operating expenses increased $230,506, or 65 per cent; and taxes increased $2,408, or 93 per cent.

Four additional lines were established during the year. Effective on Aug. 8, 1927, the Public Service Commission authorized increased rates of fare to equal rates authorized for United Traction Company lines.

Rate Fixing—What Constitutes Fair Value

I. Montefiore Levy, of the New York Bar, and formerly Commissioner of Education, has an article "Rate Fixing—What Constitutes Fair Value," in the New York *Law Journal* for March 24. It is a very interesting review of the situation, considering the limitations of the space it occupies. As Mr. Levy points out, almost a generation ago the United States Supreme Court held that, while the people could fix the rates, the railroads are public utilities and, although their property is charged with a public use, the rate must be reasonable, so as not to violate the constitutional prohibition against confiscation of property without reasonable compensation. At first, there was a long line of cases trying to define what was reasonable compensation and, in order to do that, one necessarily had to decide first what the value of the property was, and then the question arose, at what value the property should be taken, its value at the time of its production or its value at the time of the controversy.

According to Mr. Levy, while the court has laid down the doctrine of fair value, it has prescribed no definite rule by which to ascertain that value. Several lines of inquiry have been suggested that may be pursued, but the court, limited by human judgment, has wrestled and is still wrestling with the problem. After citing many of the so-called key cases, among them McCardle vs. the Indianapolis Water Company, he says that "from the determination reached in the McCardle case it can be surmised that the tendency of the Supreme Court of the United States is to place emphasis on reproduction cost as a basis for determining 'fair value,' and that it is disposed toward liberality in deciding what would be a reasonable return on such fair value."

Voting Trust Agreement for Omaha

Holders of all outstanding common and preferred stock of the Omaha & Council Bluffs Street Railway, Omaha, Neb., have been asked by a committee composed of Albert Strauss and Marshall S. Morgan, New York, and Fred Hamilton and Louis S. Nash, Omaha, to deposit their stock so a voting trust may be created composed of John N. Shannahan, Sidney W. Noyes, Edwin N. Sanderson, Albert Strauss and Fred Hamilton.

The committee reports that 95 per cent of the bonds, which fell due last January, are now in its hands pursuant to an agreement to extend them three years in order to allow President Shannahan a free hand in working out his plans for rejuvenation.

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Book Reviews

Car Builders' Cyclopedia

Simmons-Boardman Published Company, New York, N. Y. Twelfth edition. 1,200 pages. Price, $5 cloth; $7 leather.

This work is a complete summary of all details of rolling stock. Never before has the book been so completely revised nor more new material added than in this new 1928 edition, which is ready for delivery. It is the first edition of the Car Builders' Cyclopedia—the standard authority on steam railroad freight and passenger rolling stock—to be published since 1925. It, therefore, records the latest development in car design, maintenance practices and equipment.

The first edition of the Car Builders' Cyclopedia was published in 1879—49 years ago. It was an illustrated dictionary, which for the first time defined the proper terms or names of parts used in the construction of railway cars. Through the succeeding years, with the many changes and innovations in car design, the successive editions of the Car Builders' Dictionary, as it was first called, have faithfully recorded the new information and new developments.

The work is edited by Roy V. Wright, managing editor of the *Railway Age* and editor of the *Railway Mechanical Engineer,* assisted by R. C. Augur and compiled under the direction of the advisory committee of the American Railway Association, Division V, Mechanical.

The Behavior of Prices

By Frederick C. Mills, National Bureau of Economic Research, New York. 598 pages. Price, $7.

Business men and economists will find this book of the greatest interest. It is notable for the emphasis which is placed on the individual commodity. It shows the relation of the price movements of individual commodities to the movements of other individual price series. It also treats price series in combination. By turning to the commodity index the reader can locate all the references in the book to the specific commodity that interests him, and by fcllowing the page references can trace the variability of its price; its trend over a period of years; the length of its own business cycle; and how it acts during general price movements.

The objectives of the present study were, first, to secure a fuller understanding of the behavior of individual commodity prices and, secondly, to increase the knowledge of the working of the price system and of the interrelations between its component elements. No attempt has been made in presenting the results of this study to support a specific thesis. The investigation has been looked upon as part of a general attack upon the problem of charting the price system, defining its elements, tracing the connections between these elements, determining the nature of the changes which occur in the price system with the passage of time and with changes in general economic conditions, and of describing more exactly the part which the system of prices plays in economic processes. This view of the relation of the present study to the broad task of surveying the price system has conditioned the plans for the investigation and has determined the form in which the results appear.

The Road to Plenty

William Trufant Foster and Waddill Catchings. The Pollak Foundation for Economic Research. Boston, Houghton, Mifflin Company. 232 pages. Price, $2.

In the "Road to Plenty," the authors offer their solution for the "dilemma of thrift" which they pointed out and thoroughly discussed in their three previous books, "Money," "Profits" and "Business Without a Buyer." The new book is written for the layman. The theory which Messrs. Foster and Catchings have propounded in their earlier works is that economic depressions, with their accompanying unemployment, idle factories and capital are due to the reduction in consumer purchasing power, and that this reduced purchasing power is due, in turn, to the abstraction of both corporation and individual savings from the cycle of money flow between producer and consumer. This, then, is the dilemma, that the worker—who is also consumer—is urged to save, but by his savings brings about depression. He saves to his own ultimate disadvantage.

The cure for this condition, the authors believe, lies in increasing the construction of public works and production facilities at a rate sufficient to make up for the loss due to the abstraction of savings. Thus, by putting money into the hands of workers, the purchasing power always is kept even with productive capacity.

Obviously, if productive capacity, instead of being increased by spurts, were developed only at the same rate as the increase in consuming power, the economic swings would be avoided. Their proposal is that a mechanism be set up for holding productive and consumptive capacity in balance—to keep the consumptive power always large enough to absorb the goods the factories are able to produce. Their proposal, specifically is that the federal government collect data that will disclose at any time the relationship between productive and consumptive capacities and, when the latter tends to decline, to increase public works construction. Now we know where we are only when the depression is upon us. To serve a preventive purpose the data will need to be much expanded, and this is what Messrs. Foster and Catchings recommend.

Looking at their proposed remedy, it is patent that the problem is a complex one and that the solution will not be easy. There is the difficulty, first, of getting all the data; second, of knowing what the data mean; third, of setting up the mechanism for wise and speedy increase of public works construction. But, as the authors maintain, we shall not progress towards a solution unless we try.

National Electric Safety Code

Handbook Series No. 3 of the Bureau of Standards, fourth edition. Department of Commerce, United States Government Printing Office, Washington, D. C. 526 pages. Price, $1.

In the preparation and revision of the code the Bureau of Standards had the co-operation and assistance of many state industrial and public service commissions, municipal electrical inspectors, engineers of operating and manufacturing companies, committees of engineering societies and representatives of the electrical workers of the fire and casualty insurance interests. The revision was carried out under the rules of procedure of the American Engineering Standards Committee. The fourth edition contains but minor changes in the general substance of the rules. The regulations dealing with line construction incorporate some important changes. The rules of this part have been rearranged entirely. This new arrangement should increase the facility of reference and make more clear the intended effect of the requirements.

A new section, part 5, has been added dealing with radio installations. The code represents a growth and development which will necessarily continue. The code rules provide specifically for variations from particular requirements when circumstances warrant different practices. Sag and tension tables and curves are included in the appendices.

Utilities Commissioners Association

1927 Proceedings of the 39th Annual Convention, National Association of Railroad and Utilities Commissioners—New York, N. Y. 600 pages. Price, $5.

Full reports on valuation, public relations, public ownership, safety of operation, motor vehicles and others on up-to-date topics before the Dallas Convention of this association are printed in full in the 1927 Proceedings of the National Association of Railroad and Utilities Commissioners. The addresses of many speakers such as William A. Prendergast, chairman New York Public Service Commission and Lucius S. Storrs, managing director of the American Electric Railway Association, are of interest to bankers, lawyers, railroad executives and public utility managers. Special features are the addresses of John J. Esch, former chairman of the Interstate Commerce Commission, entitled, "The Age of Speed" and of Frederick A. Farrar, vice-president of the Electric Bond & Share Company, called, "Financial Problems of Public Utilities."

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Personal Items

J. S. Harrison Has New Title in Jacksonville

J. S. Harrison, for more than a quarter of a century claim agent of the Jacksonville Traction Company, Jacksonville, Fla., is now known as general claims attorney. The general claims attorney began working for the Jacksonville Traction Company as secretary to the manager in 1899 and was made claim agent in 1902.

Mr. Harrison was born at Olustee, Fla. He attended the Florida University, which was then known as the Florida Agricultural College. He took a special course in law at the Florida Law School under Walter B. Clarkson, of Yale.

Changes in North Dakota Commission

At the reorganization meeting of the Board of Railroad Commissioners, North Dakota, held on April 1, Fay Harding was elected president. Among his present duties Mr. Harding will continue to handle the matters relating to the licensing of buses.

Ben C. Larkin has been appointed commissioner succeeding the late Frank Milhollan. Mr. Larkin has been chief elevator accountant for the commission since July, 1925. For many years he was active in public life in North Dakota and is a former Speaker of the North Dakota House of Representatives.

New Receiver of Detroit-Jackson Road Selects Staff

Following the appointment of John F. Collins, vice-president and general manager of the Michigan Electric Railway lines, as receiver for the Detroit, Jackson & Chicago Railway, he announced the following staff:

H. D. Sanderson, Jackson, chief engineer and manager for the receiver; Otto H. Degener, Jackson, secretary-treasurer; G. W. Quackenbush, Grand Rapids, traffic manager; R. C. Taylor, Albion, superintendent of equipment; R. Southard, Ypsilanti, general superintendent; R. W. O. Taylor, Jackson, purchasing agent.

Besides directing the management of the M. E. R. lines, Mr. Collins is president of the Southern Michigan Transportation Company and the Rapid Transportation Company, operating buses between Jackson and other Michigan cities. Electric railway and bus lines totaling 723 miles in length are administered by Mr. Collins from his central office in Jackson.

In commenting on the appointment of Mr. Collins, the *Citizen-Patriot* of Jackson said:

The appointment is an earned tribute to Mr. Collins' ability as an administrator. In the face of the most discouraging competition he has kept the M. E. R. system out of receivership, and through the organization and promotion of bus routes paralleling the electric lines has infused new hope into the interurban transportation business in Michigan. The bondholders of the D. J. & C. apparently have turned to him as a refuge in time of distress.

H. T. Connolly Heads Maryland Association

H. T. Connolly was elected president of the Maryland Utilities Association at the meeting in Baltimore on March 23. Mr. Connolly is general manager of the Washington, Baltimore & Annapolis Electric Railroad. He entered the service of that company twenty years ago, starting in as a substation operator. Later he was promoted to the position of foreman of substations. Three years thereafter, at the time the Washington, Baltimore & Annapolis acquired the old Annapolis Gas & Electric Light Company, later the Annapolis and Chesapeake Bay Power Company, Mr. Connolly was made superintendent of power and in 1922 he became manager of utilities. Two years later he was made superintendent of equipment and in June, 1925, was appointed general manager of the property. At that time James J. Doyle was elected president. Before Mr. Connolly's affiliation with the Baltimore organization he was in the electrical field, serving with the old Maryland Steel Company, now the Bethlehem Steel Company, at Sparrows Point, Md.

H. T. Connolly

Mr. Connolly was born in Baltimore Dec. 29, 1888. He attended private schools in that city.

WILLIAM N. NEFF has been appointed general superintendent, in charge of operation and maintenance of way and structures of the entire Northwestern Pacific Railroad System. Since April 1 his headquarters have been at Sausalito, Cal.

H. V. Faber at Savannah, and B. T. Moore in Jacksonville

H. V. Faber, for two years assistant treasurer of the Jacksonville Traction Company, Jacksonville, Fla., has been transferred to the Savannah Electric & Power Company, Savannah, Ga., to act in the same capacity. At Savannah he succeeds Paul Fleming, who resigned to become associated with the Philadelphia & Reading Coal & Iron Company at Philadelphia.

Mr. Faber went to Jacksonville in July, 1926, from the treasurer's office of Stone & Webster, Inc., of Boston, to become assistant treasurer. He was at one time assistant treasurer of the Haverhill Gas & Light Company, Haverhill, Mass., and prior to that was traveling auditor for the parent organization. During the time the Hog Island shipyard was under the executive management of Stone & Webster he was cost accountant there. He was also treasurer of the Florida Public Utilities Information Bureau.

Benjamin T. Moore, formerly a traveling auditor for Stone & Webster, Inc., from the firm's office in Boston, has succeeded Mr. Faber at Jacksonville. Mr. Moore was at one time chief clerk of the Mississippi River Power Company. Later he was assistant treasurer of the Keokuk Electric Company, Keokuk, Iowa. In 1925 he was assigned to the auditing department at Boston.

P. A. MAXIMOV, president of the Soviet Electrotechnical Trust, has arrived in New York accompanied by B. I. Bukhovtsev, production manager of the trust, to make a study of the electrotechnical industry and of electric railways in the United States. The introduction of electrical power in industry, transportation and for lighting purposes is proceeding now on a scale never before known in Russia. Mr. Maximov expects to stay in this country about six weeks. Together with Mr. Bukhovtsev he will visit Schenectady, Boston, Chicago, Milwaukee and other industrial centers.

Obituary

HOMER M. PRESTON, railway operator and banker, died at his home near Jamestown, N. Y., on April 2. Mr. Preston was president of the Jamestown, Westfield & Northwestern Railway, the Jamestown Street Railway and the Jamestown Motor Bus Transportation Company. When Almet N. Broadhead, who controlled the Jamestown properties, died in 1925 Mr. Preston was elected president. While separate corporate structures have continued, the railway and bus lines have been operated under one general management. Mr. Preston had previously served as a director and vice-president of the Warren-Jamestown Street Railway and had been affiliated with the Southwestern Interurban and with the Union Traction Company.

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Manufactures and the Markets

Chicago "L" May Buy 200 More Cars

Many improvements in service have been made by the Chicago Rapid Transit Company, Chicago, Ill., during the last five years. The company has added 205 new steel cars of the latest design to its equipment. It has lengthened station platforms on the Loop and on all the lines, and operated six-car and eight-car trains in the rush hours, where previously five-car and six-car trains were operated. It has built a large modern station at Quincy and Wells Streets, with convenient connection to the Loop station platform at Quincy and Wells Streets, and it has built the first unit of its new shops at Niles Center. Those are a few of the major improvements that have been made in the last few years for the better service of the public.

There are other improvements which the company would like to make. There is a pressing need for express tracks on the Garfield Park Branch between Marshfield and Laramie Avenue. The company would like to purchase 200 additional steel cars this year. The carrying out of these improvements would appear to be presaged on the success of the company's appeal for a change in rates, now pending, since as the company itself says that "the money to make such improvements must come from investors, and unless the company can show reasonable earnings on its investment, new capital cannot be obtained."

Danville and Crawfordsville Railway Proposed

Construction of an electric railway between Danville, Ill., and Crawfordsville, Ind., and a secondary line between Ridgefarm and Paris, Ill., giving the Illinois Traction System and the Terre Haute, Indianapolis & Eastern lines two connecting links, was discussed at a conference in Danville recently. D. W. Snyder, Jr., vice-president and general manager of the Illinois Traction, and G. K. Jeffries, Indianapolis, vice-president and general manager of the Terre Haute, Indianapolis & Eastern, met representatives of the cities interested in the plan to link the two railway systems. The Paris line discussion brought out that a belt line would be imperative around Terre Haute, where heavy freight trains are not allowed through the city, adding $1,000,000 to the project cost and the Ridgefarm-Paris line would mean another $800,000. Use of this route as the main line would require strengthening of the trackage between Danville and Ridgefarm and between Paris and Terre Haute, with 40 miles added to the route distance. Illinois Traction representatives favored the direct line, but added that a light freight line serving the Paris district might be advisable since it would cost less. The Crawfordsville line would involve an expense of between $4,000,000 and $5,000,000 since the Vermilion River would have to be crossed once and the Wabash twice.

Kansas City to Complete Rehabilitation

The Kansas City Public Service Company, Kansas City, Mo., will spend over $2,000,000 this year to complete the $6,600,000 rehabilitation program planned when the company was reorganized. The program of the construction department involves the laying of approximately 20 miles of tangent track and 27 new special work layouts. The work of this department will cost more than $1,000,000. It was scheduled to start March 1 and end in October.

The maintenance department will remodel 414 passenger cars during the year. Safety air equipment will be installed on 93 100-type cars, 47 400-type cars, and 14 1,000-type cars, or 154 cars in all.

The 1928 program includes the installation of ventilators, window wipers, safety air equipment, line breakers, back-up control on double-truck cars, air rectifiers, thermostatic heat control, economy meters, double folding doors and treadle-operated doors on rear platforms. Aside from the regular overhaul work, rearrangement of the seats, stanchions and railings will be made where greater aisle space is needed.

In addition to the foregoing expenditure, the equipment department was allowed more than $70,000 to cover other improvements, one important item of which is $60,000 for the installation of steel wheels. This will equip approximately 50 per cent of the cars with steel wheels. All of this money is above the normal maintenance expenditure of $663,000 for the year, making a total expenditure in the equipment department of approximately $1,620,000.

In the other departments, way and structures, electrical distribution, and coach garage, $220,000 was authorized for improvements, including an expenditure of $157,000 to cover the cost of building a new a.c. distribution bus at the Grand Avenue power station and re-arranging the a.c. cables between the power station and the substations.

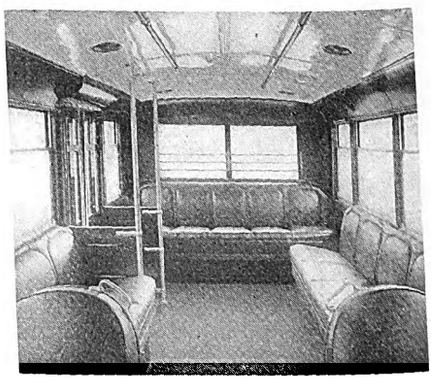
Trackless Trolleys for Prague

Trackless trolleys will be installed in Prague, Czechoslovakia, on a route where former street car service has been discontinued, it is announced by the president of the board of directors

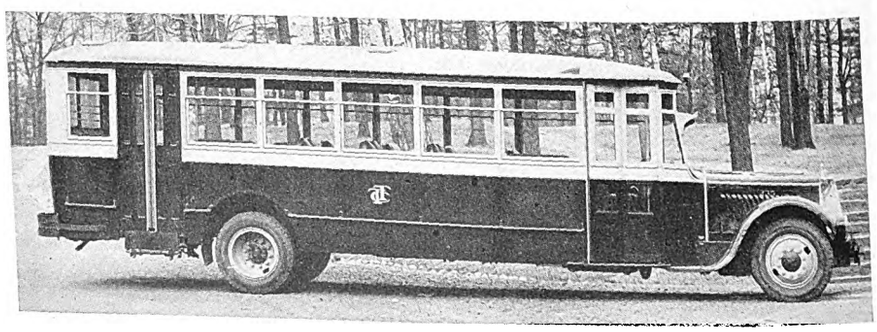
Toronto Buses Delivered

Fifteen Mack city type buses have been delivered to the Toronto Transportation Commission, Toronto, Canada. This is the first consignment of buses for use in Canada to be equipped with rear treadle operated doors, a product of the National Pneumatic Company.

As an extra precaution for the safety of passengers using the rear-exit treadle doors, each bus has been equipped with a rear-view mirror. The mirror is fastened to the outer window frame on the right side of the bus, giving the driver a full view of the rear exit door. The buses are equipped with 29-passenger bodies of wood frame construction, built by the Bender Body Corporation.



The seating arrangement of the Toronto buses allows ample standing room for the rush hours



One of the fifteen Mack treadle buses delivered to the Toronto Transportation Commission

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of the Prague Electric Railway Administration. The new cars will be arranged so that they can turn aside 5 m. or almost 16½ ft. on either side of the trolley wires. If they prove successful it is expected that their use will be extended.

Space Applications for A.E.R.A. Convention Mailed to Members

This year the Cleveland Convention Committee of the American Electric Railway Association, of which Col. J. H. Alexander is chairman, has provided over 135,000 sq.ft. of desirable inside space and over 3,000 lin.ft. of track space for car displays. Diagrams of the show space layout at the 47th Annual Convention, together with applications in duplicate, were mailed from Association headquarters, via registered mail to all manufacturer company members on April 14.

The procedure followed in previous years of allowing a time of 30 days for filing space applications, will again be in force this year. Fred Dell, exhibit director, calls attention to the fact that all applications received at Association headquarters, 292 Madison Avenue, New York, up to the close of business on May 14, will be awarded space by the exhibit committee, which meets shortly thereafter to make the official assignments. Should any space remain vacant after the official assignment, it will be allotted in the order in which applications are received.

Attention is also called to the fact that in order to assist the commitee in making an intelligent space assignment, all questions on the application blank should be answered in detail. This is important and if the forms are filled in carefully exhibitors will save themselves some unnecessary annoyance in the way of additional correspondence to secure such information as asked for.

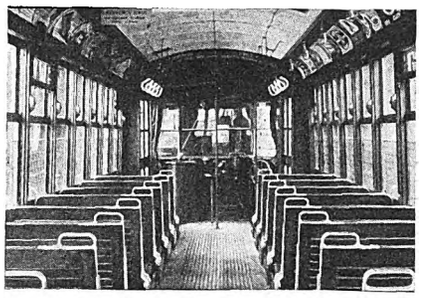
The exhibit this year promises to be larger than ever before. There will be some new companies which have not exhibited before, from both the railway and automotive field, and the products of these companies will bring added interest to the exhibit, which, it is agreed, is one of the largest and finest transportation exhibitions shown in the world today.

To secure a good location all who intend exhibiting are urged to get their applications in as promptly as possible. Each application is dated, time stamped and numbered in the order received and a careful check up of the list is presented to the exhibit committee when it meets to make the official allotment.

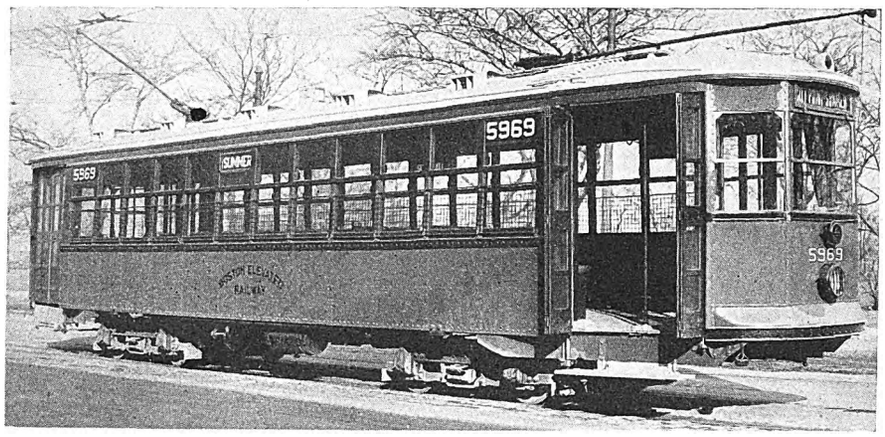
This is the one opportunity afforded manufacturers during the year to present to the practical railway man a comprehensive and intelligent display of old and new devices that are being offered and to bend his mind toward acquiring those products which will improve his service and consequently increase his income. Every manufacturer should at all times bear in mind that the annual convention and exhibit is the market place of the industry and that from the Association's standpoint its every activity is directed to the one end of prospering the industry so it can make necessary appropriations for the purchase of new equipment, new materials and supplies. Don't delay sending in your space application.

Cars Delivered to Boston Elevated Railway

The ten semi-steel cars being built for the Boston Elevated Railway, Boston, Mass., by the Laconia Car Company, Laconia, N. H., have been delivered. They are of the one-man, two-man double-end type, they have a total weight of 31,462 lb. with an over-all length of 45 ft. and a seating capacity of 48. Each car is equipped with four GE-264A inside-hung motors, GEK-71 control and Westinghouse air brakes with variable load attachment. Complete specifications were published in the Oct. 8 issue of the JOURNAL.



These one-man, two-man cars will seat 48 passengers



One of the ten semi-steel cars recently delivered to the Boston Elevated Railway

T. W. Casey Heads National Pneumatic Company

At a meeting of the executive committee of the National Pneumatic Company, held April 10, Harold Rowntree resigned as president of the company and was elected chairman of the board of directors. At the same meeting Thomas W. Casey, for many years vice-president of the company, was elected president to succeed Mr. Rowntree; P. R. Forman, who has been general manager, was elected vice-president and general manager, and Frank Johnson was re-elected secretary and treasurer.

Roller Bearings Being Tried in Green Bay

A Birney type street car equipped with roller bearings has been put into service by the Wisconsin Public Service Corporation in Green Bay, Wis. The new roller journal bearings are of the Melcher type now being supplied by the Railway Motors Corporation, DePere, Wis., for steam railroad cars. It is planned to keep a close record of the power used by this car and the cost of maintenance for the journal bearings. If the power is reduced 40 per cent as claimed, the economy may warrant the replacement of all present bearings.

Toronto Tests Lacquer

Toronto Transportation Commission, Toronto, Canada, has sprayed four cars with lacquer of four different manufacturers for the purpose of testing its durability as compared with enamel which is the standard material now used.

Foreign Traders to Talk on Latin-America

Five special trains will carry the bulk of the 1,500 delegates from all parts of the United States to the Fifteenth National Foreign Trade Convention to be held at Houston, Texas, on April 25, 26 and 27, next, announces O. K. Davis, secretary of the National Foreign Trade Council, in a statement of program and travel arrangements for the annual foreign traders gathering.

The principal theme of the convention will be trade with Latin America and the presence of business delegations is already assured from more than ten Latin American countries. In 1927 the total trade of the United States with Latin America was close to $2,000,000,000, slightly greater than that of England, France and Germany, the three principal competitors of the United States.

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American Engineers to Join in World Conference

Engineering leaders from practically every part of the United States meeting at Washington, D. C., on March 22 formulated preliminary plans for the participation of engineers of the United States in the World Engineering Congress which will be held next year in Tokio. An American Committee to arrange for the part the engineers of the United States will play in the Congress was formally organized and officers elected.

The engineers went to the capital on a special train from New York and Philadelphia for the dinner and meeting. The following officers and committee chairman of the American Committee, which will arrange for the sending of a large delegation of American engineers to the Congress in Japan, were elected: Honorary chairman: Herbert Hoover; chairman, Elmer A. Sperry, New York; vice-chairman and chairman of the executive committee: John W. Lieb, New York; vice-chairman, Pacific Coast: C. E. Grunsky, San Francisco; C. E. Kettering (Middle West), Detroit; executive secretary, Maurice Holland. Executive committee members are: Gano Dunn, New York; George W. Fuller, New York; Maurice Holland, New York; Dugald C. Jackson, Cambridge, Mass.; Frank B. Jewett, New York; John W. Lieb, New York; J. H. McGraw, New York; O. C. Merrill, Washington, D. C.; Calvin W. Rice, New York; Charles F. Scott, New Haven, Conn.; Elmer A. Sperry, Brooklyn, N. Y.; W. E. Wickenden, New York. John W. Lieb leads the finance committee; D. C. Jackson the technical program committee; F. B. Jewett the transportation committee; O. C. Merrill the entertainment committee; J. H. McGraw, publicity; promotion and attendance, George W. Fuller; nominating committee, Gano Dunn.

German Firm to Construct Electric Locomotives

Krupp, the great German engineering firm, has decided to undertake the construction of electric locomotives. In conjunction with the firm of Garbe, Lahmeyer & Company, of Aachen, a new type of motor for electric traction has been developed. This is a commutatorless, compensated single-phase motor, said to combine the efficiency of the three-phase motor with the advantages of the single-phase system regarding the supply of current.

As the result of satisfactory tests with the new invention, two shunting locomotives were constructed for the I. G. Farbenindustrie, one of which is said to have given entire satisfaction at a coal mine in central Germany. The importance of this new development lies in the fact that the current can be drawn direct from the main transmission lines, thus doing away with the necessity of transformer stations which hitherto have been essential. According to Krupp's estimate this will mean a saving of approximately 30 per cent on the present cost of electrification. The patent is owned by Krupp's, which will manufacture the locomotives, and the motors will be supplied by Garbe, Lahmeyer & Company.

METAL, COAL AND MATERIAL PRICES
F. O. B. REFINERY

	April 10, 1928
Metals—New York	
Copper, electrolytic, cents per lb	13.925
Copper wire, cents per lb	16.00
Lead, cents per lb	6.10
Zinc, cents per lb	6.10
Tin, Straits, cents per lb	51.75
Bituminous Coal, f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	4.15
Somerset mine run, f.o.b. mines, net tons	1.875
Pittsburgh mine run, Pittsburgh, net tons	2.00
Franklin, Ill., screenings, Chicago, net tons	1.825
Central, Ill., screenings, Chicago, net tons	1.675
Kansas screenings, Kansas City, net tons	2.375
Materials	
Rubber-covered wire, N. Y., No. 14, per 1,000 ft.	15.30
Weatherproof wire base, N.Y., cents per lb.	16.5125
Cement, Chicago net prices, without bags	2.05
Linseed oil (5-bbl. lots) N. Y., cents per lb.	10.00
White lead in oil (100-lb. keg), N. Y., cents per lb.	13.25
Turpentine (bbl. lots), N. Y., per gal.	$0.635

Hungarian Electric Locomotives for Spain

The Ganz-Danubius Company and the Ganz Electrical Works of Budapest have just signed a contract with the Ferrocariles Vascongados of Spain for the delivery of nine electric locomotives and eleven electric rail motor cars, of which six are to be passenger and five freight cars.

TRACK AND LINE

Oregon Electric Railway, Portland, Ore., has filed an application to the Interstate Commerce Commission for authority to be substituted for the Linn County Logging & Lumber Railway in the proceeding on the latter's application for a certificate for the construction of an extension of its line in Linn County, Ore. The application states that the Linn County company has assigned its rights to the Oregon Electric, a subsidiary of the Spokane, Portland & Seattle Railway.

St. Louis Public Service Company will improve the Wellston loop facilities so that seventeen cars may be handled at one time. The improvements will cost approximately $95,000. One of the decided improvements will be that the St. Charles cars, which come into Wellston at Easton Avenue and stop for passengers in the very heart of traffic on the St. Louis-Kansas City highway, will now proceed to the loop to await their schedule time for departure, thus clearing Easton Avenue. The city limits and Wellston division of St. Louis will continue to use the loop.

Long Island Railroad, New York, N. Y., has been ordered by the Transit Commission to eliminate 31 grade crossings in Queens, N. Y., in accordance with the plan arranged with the state.

TRADE NOTES

Robert J. Deneen and Frederic Attwood were elected vice-presidents of the Ohio Brass Company at a meeting of the board of directors held Feb. 7, 1928. Mr. Deneen is in charge of the company's sales activities in the Chicago district, while Mr. Attwood is in New York in charge of the eastern sales district.

Watson-Stillman Company, New York, has appointed as manager of railroad sales, H. J. Hair, formerly sales engineer for the Whiting Corporation. He will be located at the main office of the Watson-Stillman Company, 75 West Street, New York City.

Gold Car Heating & Lighting Company, Brooklyn, N. Y., has appointed as sales engineer with headquarters at Brooklyn, H. W. Dillon, formerly sales engineer of Chicago Pneumatic Tool Company. J. P. Rapp, formerly with Standard Steel Car Company, has also joined the eastern sales department with headquarters in Brooklyn, N. Y.

Westinghouse Electric & Manufacturing Company has appointed Justin G. Smeby welding engineer at the South Philadelphia works. He is a member of the American Society of Naval Architects and Engineers and an officer in the U. S. Naval Reserve Force.

Canadian Ohmer, Ltd., Montreal, Canada, has been granted a Dominion charter for the purpose of acquiring the business of Canadian Taximeters, Ltd., and of marketing in Canada all products manufactured by Ohmer Fare Register Company of Dayton, Ohio. W. P. Kearney, Montreal, has been chosen president; H. B. Ohmer, Dayton, Ohio, vice-president and treasurer; M. W. Drayton, Montreal, second vice-president and secretary; R. H. Ohmer, assistant treasurer. These officers, together with R. L. Hubler, constitute the board of directors. A. J. Hopkins has been appointed general manager.

ADVERTISING LITERATURE

Vanadium Corporation of America, New York, N. Y., has issued a booklet "Automotive Springs," giving a description of the manufacture and requirements of springs.

International Steel Tie Company, Cleveland, Ohio, has published a bulletin descriptive of track paving on a production basis.

Ohmer Fare Register Company, Dayton, Ohio, has printed form number 850 giving information on the use of Ohmer fare registers.

Consolidated Car Heating Company, Inc., Albany, N. Y., has issued a folder entitled "At the Port of Albany," descriptive of the various products that it manufactures.

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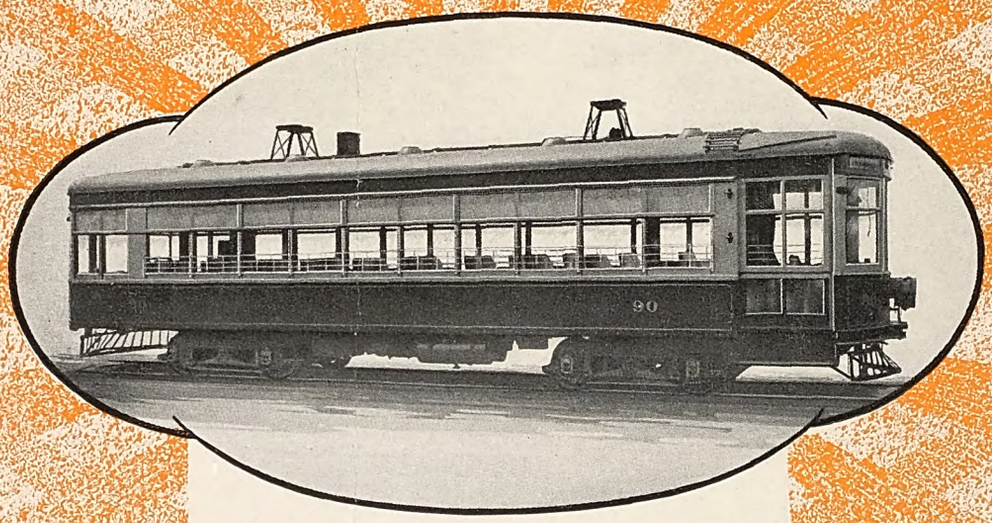

The Southwest Missouri Cuts Operating Costs

An ever increasing number of electric railway companies are successfully competing with the modern automobile, increasing public patronage and reducing operating costs. How is it being done? The answer is Brill Modern Cars.

For example, take the light weight car built by the American Car Company for the Southwest Missouri Railroad Company. This car was designed to include the latest equipment for passenger comfort and distinctive appearance—hence its success in interurban service.

Note this statement of the Assistant General Manager, "We placed a meter on Car No. 90 and took the readings for nearly three months. Compared them with readings on a 46,000-lb. car on a similar run and found a saving of about 18% in power. The labor cost shows a saving of about 40%. From our observation and from what the trainmen report we feel that many people do ride in No. 90 who have heretofore gone in their automobiles."

Ask for further facts about
BRILL MODERN CARS.

The J. G. Brill Company, Philadelphia
American Car Company, St. Louis
The G. C. Kuhlman Car Co., Cleveland
Wason Manufacturing Co., Springfield, Mass.

Brill Light Weight Interurban Cars

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HASKELITE

Public Service buses use HASKELITE

OUT of 1,353 buses bought since 1923 by the Public Service Coordinated Transport Co., Newark, N. J. 1,309 have been HASKELITE-equipped.

The fact that HASKELITE is being used in the big schedule of bus construction now under way (the sixth consecutive HASKELITE contract) is the strongest indication of their satisfaction with this blood albumen glue plywood.

Leading builders and operators of both buses and street cars know from experience that HASKELITE and its steel-faced companion, PLYMETL, result in light weight, added strength, and low operating and maintenance costs.

Get our blue print booklet. Copy sent on request.

Haskelite Manufacturing Corporation
133 West Washington Street, Chicago

PLYWOOD
HASKELITE
PLYMETL

ERJ 4-14-Gray

Railway Representatives:

Economy Electric Devices Co., 37 W. Van Buren St., Chicago.

Grayson Bros., 600 LaSalle Bldg., St. Louis, Mo.

Railway and Power Engineering Corp., Ltd., Toronto, Ont., Canada.

PLYMETL

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MAINTENANCE AND CONSTRUCTION ISSUE

ELECTRIC RAILWAY JOURNAL

McGraw-Hill Publishing Company, Inc. APRIL 21, 1928 Twenty Cents per Copy

Franklin

APR 23 1928

1000 MILES OF PAVED TRACK

—*how much money will be saved?*

THIS year about one thousand miles of paved track will be laid. Modern production methods will be used. Old fashioned methods will be used. Every mile laid with wooden ties and yesterday's methods will cost more to lay, more to maintain, and be a poorer job, than can be done with modern methods and Steel Twin Ties.

Mass production methods plus Steel Twin Ties make the laying of paved track a fast, efficient operation. The result is a piece of track that lasts for the life of the rail, affords a smooth roadbed for cars—and costs less!

Write today for delivered prices for *your* 1928 track program.

Just Out!

The Second Edition of the Paved Track Notebook. Write for your copy.

THE INTERNATIONAL STEEL TIE CO.
Cleveland, Ohio

STEEL TWIN TIE TRACK
THE BASE OF MODERNIZATION

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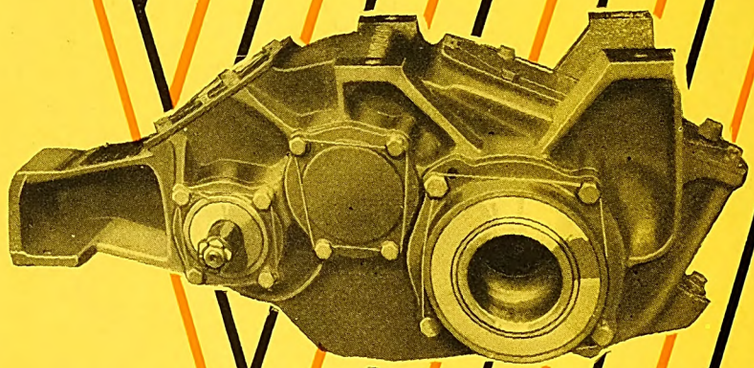
One of the Greatest Advances in Electric Traction Progress



The new W-N Drive is destined to effect tremendous improvements in electric railway operations. It has been developed by Westinghouse and Nuttall engineers to give to traction companies all the advantages of light, compact, high-speed, high-efficiency motors—less initial investment, reduced maintenance cost, smoother starting, quick acceleration and quiet operating.

Some of the features of the W-N Drive are high ratio of speed reduction, heat-treated hardened helical gears, Timken roller bearings and oil-tight steel gear case.

The advantages of this remarkable drive are so pronounced, you should give it most careful consideration. May we send you complete details?

R.D. NUTTALL COMPANY
PITTSBURGH PENNSYLVANIA

Canadian Agents:
Lyman Tube & Supply Co., Montreal, Toronto and Vancouver

All Nuttall Products are sold through the Westinghouse Electric & Mfg. Co., district offices. Refer your inquiries to the nearest Westinghouse Office.

Nuttall

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APR 23 1928

Electric Railway Journal

McGraw-Hill Publishing Co., Inc.
JAMES H. MCGRAW, *President*

Consolidation of Street Railway Journal and Electric Railway Review

CHARLES GORDON
Editor

Volume 71 New York, Saturday, April 21, 1928 *Number 16*

Not Enough Comparison of Maintenance Costs

COMPARISONS of maintenance costs on various properties give an opportunity to determine whether one's own practices are in line with those in use elsewhere, and whether possibilities have been overlooked for doing the work better or at lower cost. Of course such comparisons, to be of maximum value, must be considered along with those of service reliability. Any maintenance executive can cut down his costs for a time by deferring necessary work and sacrificing reliability. But when the records are studied over any extended period the shortcomings of such practices are bound to make themselves evident.

Maintenance costs are not interchanged among electric railway properties as generally as they should be. Maintenance men have not given the matter the attention it deserves, for a number of reasons. While the standard classification of accounts is almost always used the details are not always comparable. The physical conditions of properties vary widely and have a direct bearing on maintenance costs. Then all too often there is a lack of appreciation of the value of studying the other fellow's figures and methods. Even some of those who interchange data have not obtained the maximum benefit because of failure to analyze the figures and to effect needed changes in their maintenance methods that are obvious to an impartial observer.

The cost per unit is not in itself a conclusive measure of excellence. Either high or low figures, considered abstractly, mean little in themselves. Variations in accounting as between depreciation or renewal reserves and operating maintenance accounts cause some difficulty in making comparisons. Other causes of variations in costs are the age, type and state of repair of the cars; the supervision and shop facilities, and the operating characteristics of each company. For instance, the total cost of equipment maintenance for the properties in the Electric Railway Association of Equipment Men, Southern Properties ranges from $13.67 to $30.46 per 1,000 car-miles, while cost of labor for cleaning and inspection ranges from $6.59 to $17.38 per 1,000 car-miles.

On the other hand, costs that are out of line must not be waved aside with the general and time worn excuse of "local conditions." High figures should be considered the signal to look for expensive practices or those that are failing to give satisfactory results. Sometimes high maintenance figures are in no way a measure of the efficiency of the maintenance departments themselves but are traceable to operating practices and management policies that need correction. In that event the man responsible for maintenance may not be in a position to correct the difficulty directly, but he holds the key to opening up general questions of policy that affect directly his own performance. For these reasons he should seek rather than avoid the interchange of maintenance figures with other properties even though his own figures may seem to be high.

Regenerative Heating Shows Attractive Savings

RECOVERY of the energy that is wasted in the car resistors during acceleration with series-parallel control, and the energy which is stored in momentum and is absorbed in the brake shoes when the car stops, presents an opportunity for economy that has attracted many engineers. Regeneration of the kinetic energy of motion into electrical energy and its return to the distribution system is entirely possible, and it has been adopted with advantage on several of the heavy railroad electrifications. But for street cars and light interurbans recovery of this energy is not so simple. The series motor, which is universally used in this class of service, is not readily adaptable to serve as a generator for feeding back energy to the line.

A substitute proposition which has been tried with some success at various times is the use of regenerated electrical energy for heating the cars. While in temperate climates this opportunity is available during the winter months only, the expenditure for heating is a very considerable portion of the energy used throughout the year, sometimes running as high as 8 to 10 per cent of the total. The regeneration of energy serves an additional purpose in that it directly relieves the brake shoes of a portion of the work they are ordinarily called on to do. This makes possible either a higher braking rate or less wear on the shoes and wheels, so that even in the summer when the heat is not needed the use of dynamic braking, with the motors acting as generators, is advantageous.

Various difficulties are involved in the dynamic braking system. The rate of braking must be controlled, and since the voltage of the motors falls off rapidly as the speed is reduced, the resistance in the circuit must be changed continually as the car comes to rest. According to an article by A. W. Baumgarten, appearing in this issue, these problems have been successfully met in the installation which has been made in the experimental car of the Chicago & Joliet Railway. Both manual and automatic control are used through remote-controlled contactors, making the system flexible. Duplicate sets of resistors are installed, so that the heat can be used inside the car or discharged to the atmosphere beneath it. The heat released during acceleration is also utilized along with that produced during braking. With both together and without any external source the car was heated to a temperature of 60 deg. during winter weather. For a

This is the issue in April that is devoted essentially to maintenance and construction subjects

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short period in the early morning, prior to going out on the run, additional heat from the line was used, but this was turned off while the car was in service.

As a measure of the value of this method, Mr. Baumgarten estimated that the cost of heating a car with standard electric heaters is $501 per season, while with the regenerative system it is $200—a saving of $301, after making allowance for all charges on the extra equipment. This will be augmented by savings in the electrical distribution system, bringing the total up to some $400, according to the author. Such a saving is well worth making, if the motors are of sufficient capacity to stand the additional service, and if it does not involve any great complication in apparatus or impose added duties upon the operator.

Putting Truck Overhaul on a Production Basis

PLACING car truck overhauling on a production basis is advantageous, particularly for the larger electric railways. With them, the quantity of this work makes it necessary to prepare definite schedules for overhauling, which must be adhered to closely. One of the greatest problems is that of cutting down non-productive hours. The work may be classified into dismantling, repairing or replacing worn parts, assembling and testing. When several men work on the same truck, one will interfere with another. This results in waiting and unproductive time. If replacement parts are not at hand the workman must wait for the material or leave his place to get it.

Unless there is the necessary labor-saving equipment production will slow up at the end of the working period, due to physical fatigue of the men. Material handling equipment is needed, as most of the parts are heavy and hard to place with the accuracy needed to insure good performance. The various operations must follow progressively and without delay, else one man may interfere with others who are to follow him. Order and system are essential, and the work should be laid out so that the various operations become standardized. Each man can then become an expert in his particular duties, and the work will be done better and quicker due to greater familiarity and skill.

An outstanding example of constructive planning and systematizing of truck overhaul is found in the new Coney Island Shops for the Brooklyn-Manhattan Transit Lines, an article on which appears in this issue. One is impressed particularly with the number of one-man jobs into which the work is divided. One man removes the heavy parts with the aid of an overhead crane. Another does the cleaning in a room provided with chemical and rinsing tanks. A third man cuts off rivet heads holding parts to be replaced, and so on. There is no crowding of workmen or materials. Only a single job is done on a truck frame at one time and there are enough trucks ready to be worked on so that a man can proceed from one to the next without waiting. Free stores adjacent to the work are kept stocked with all parts needed. Balanced production makes it easy to order material far enough in advance to assure its being on hand when needed. Proper routing of work and the group arrangement cuts down rehandling and lost time.

An important factor in the success of this method is the design of the shop building, which was planned with quantity production in view. All tools and equipment needed are available and there is close supervision. Attention is given to constructive planning and scheduling. With such provisions the force necessary to carry on the work is surprisingly small. The reduction in labor costs and in the elimination of lost time will pay a handsome return on the necessary investment in spare trucks and parts.

Bus Maintenance Calls for New Standards

DEVELOPMENT of bus mechanisms has been along entirely different lines than those through which the street car has progressed. Going back to the early days, the horse car was about the simplest vehicle that could be devised for its purpose. Its working parts were few and rugged. Nearly all of them could be built by a blacksmith and repaired by him. Naturally the transition to electric drive at a period when the electric motor was still in its infancy resulted in the retention of a good deal of the same philosophy, and much of it remains in the present-day cars and in the mechanics who repair them. Parts are sturdy and rugged, but many of them lack refinement in detail. Clearances are large and a considerable variation is permissible in fitting. There is much hand work and many parts are not entirely interchangeable. This is particularly true after the car has been through the repair shop several times.

Contrast this with the development of the bus, which is a product of the automotive school. Based on quantity manufacture, the parts are turned out by automatic or semi-automatic machinery. They are correct to size within a few thousandths of an inch, whereas in railway practice allowable variations may be measured in sixty-fourths. The general use of anti-friction bearings, high grade alloy steels and finely finished surfaces in bus parts introduces new standards of workmanship and tolerances.

When it comes to repair work similar differences are noticeable. Many bus engine parts, for instance, are not reconditioned but are replaced with new ones, while railway parts are restored to their original condition as nearly as possible and returned to service. Naturally this wide departure in practice calls for workmanship of a radically different character. The bus maintenance man does more assembling and less repair work than his railway brother. But he must work within closer limitations, and must be, generally, a mechanic of an entirely different type.

Another Setback for Suburban Transit

IMPROVEMENT of transportation facilities for commuters from New Jersey, Westchester and Long Island to New York City has received another setback in Governor Smith's veto of the Mastick bill. This bill would have given official sanction of the state of New York to the studies of suburban transit now being made by the Port of New York Authority. Approval by the state of New Jersey already had been given. Despite a certain amount of objection on the part of New York City authorities, the State Legislature had passed the Mastick bill. The Governor, however, refused his signature, and there the matter rests.

Something must be done, and done quickly. No one denies that. The volume of suburban traffic into and out of New York City outgrew the transportation facilities years ago. The growth of traffic continues, but the expansion of facilities proceeds at a snail's pace. It is equally plain that a bi-state body is required to solve this problem. The flow of passengers from New Jersey

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to New York City is greater than that from all the other suburbs put together. Attempts made several years ago by the North Jersey Transit Commission to solve the problem showed that one state cannot do it alone. Therefore the Port Authority, an existing agency of interstate character, was called upon for aid. The members of that body were willing enough to tackle the job, and New Jersey was willing to let them do it, but New York has balked. What the next move will be is problematical.

Opinions differ as to whether the Port Authority is the agency best qualified to handle the suburban transit problem. The Governor intimates that it has enough to do with bridges, railroad freight movement and port planning. On the other hand, much of the passenger traffic moves over the same rails as the freight. The railroad officials with whom the Port Authority has been dealing for several years are the ones who are responsible for passenger movement. The Port Authority is already familiar with many details of the suburban transit problem. Moreover, since the Port Authority is the only bi-state agency of its kind now in existence in the Metropolitan district, it would seem better to give it the job rather than to await the creation of an entirely new agency. By disapproving of this expansion of its activities, the Governor of New York has dealt a serious blow to hopes of early improvement in suburban transit facilities.

Track Cost Is Important Element in Considering Car Replacements

IN MOST discussions of the advantages of new electric railway equipment, consideration has been directed primarily to the probable reduction in car operating costs and the effect upon railway patronage and public relations. These are, of course, outstanding considerations. But in addition there is a definite relation between car design and the very important factor of track costs. Far too little attention seems to have been given to the possibility for making substantial reductions in track investment and maintenance costs through the use of lighter electric railway rolling stock, reductions in unsprung weight and general improvements which may result from the use of more effective springs designed to reduce the shocks and impacts transmitted from the moving car to the track structure.

Consideration of track costs, as we know them today, opens a broad field for speculation as to the economies possible by improved design of electric cars. Special work, in particular, accounts for heavy expenditures in both construction and maintenance. Anything which will reduce the impact of heavy cars pounding over crossings, switches and frogs is bound to result in substantial economies.

One great obstacle to an evaluation of the effect of car design upon track costs lies in the difficulty of measuring this relationship. Only after years of painstaking observation and experiment can even an approximation be obtained of the economies to be expected. Even then it would be hard to translate the effects of car weight and spring design into terms of track dollars. Not only does track in paved streets carry the cars for which it is intended, but it frequently carries heavy vehicular traffic as well. Any move toward lighter rails and foundations that might be made possible by improved cars would necessarily have to be made slowly and cautiously, since in large measure satisfactory track construction is developed through the empirical process of experience. It is at best, therefore, a slow proceeding. There is no question, however, but that the effect on track costs is an important factor that must be taken into consideration in judging the results to be expected from new cars.

Lightning Arresters Require Regular Inspections

WITH the arrival of the summer months come frequent electrical storms and the attendant danger to electric railway equipment. While all power equipment and nearly all cars have some form of lightning protection, it must be maintained properly if it is to serve its purpose at the critical moment. It is particularly important, therefore, that protective apparatus not only be inspected prior to the season of thunderstorms, but also that a regular inspection schedule be adopted and rigidly followed. It is necessary, too, that a type of arrester adequate to the service in which it is used be installed and the proper method of testing be employed.

Some knowledge of what happens in the electrical circuit when static electricity makes itself evident is necessary to an intelligent program of lightning arrester maintenance. Accumulated static electricity in the clouds either strikes the system directly or releases bound charges, the second being the more frequent occurrence. Another source of danger is the internal disturbance. The discharge of energy from inductive circuits of motors at the time of switching often punctures the insulation. Few railway men appreciate that the arresters are protecting their equipment from such charges as well as from lightning.

The type of arrester to be selected depends on the severity of discharges from which protection is needed. The electrolytic or aluminum cell arrester is the most effective, although the spark-gap porcelain-inclosed type is favored in sections of the country where lightning storms are not severe, because of its lower first cost and simple maintenance. Whatever type of arrester is used on a car, it should be protected from rain and wheel wash. It is most essential that it provide a direct path from trolley to ground. If electrolytic arresters are kept in service all winter they should be installed inside the car to prevent freezing.

Every arrester requires regular inspection and maintenance, especially during the summer. Spark-gap arresters should be examined after every electrical storm and any damaged units replaced. Carborundum blocks of the multipath type need periodical inspecting, and gap settings for the higher-voltage carborundum arresters, which use a small gap in series with the block, need checking.

With the electrolytic arrester a regular routine of inspection should be adopted and adhered to rigidly. A small current flow is needed to maintain a film on the cell plates. On this account the cells must be charged frequently and kept in balance, particularly if of the three-cell type. The arresters themselves need testing at least once a month during the summer. For this purpose a testing set such as that devised in New Orleans and described in this issue is of value. It is good practice to take the arresters apart for storage in the winter, wash the plates and the jar and throw away the used electrolyte and oil.

Lightning arresters are very necessary pieces of equipment, but improper installation and lack of maintenance can nullify the protective value of any type.

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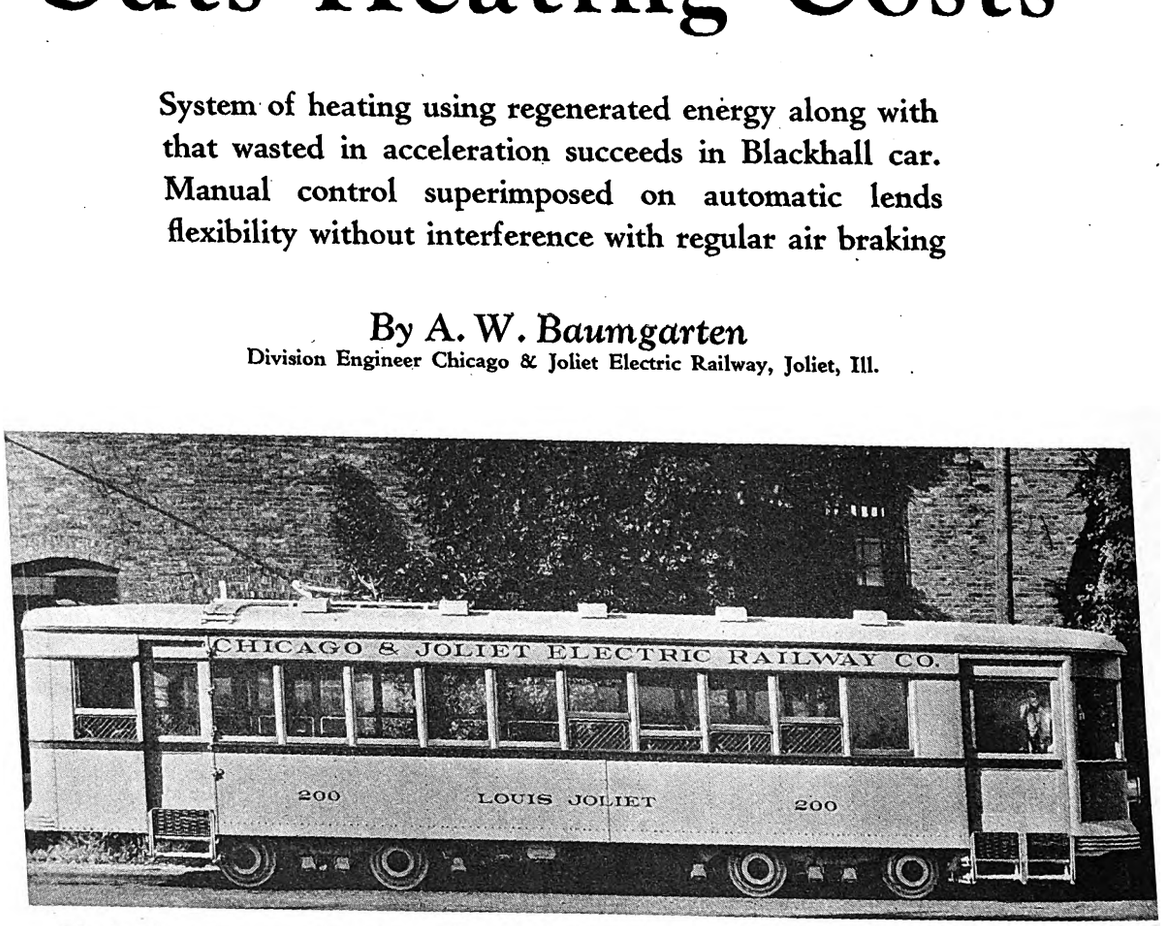
Energy from Dynamic Braking

Cuts Heating Costs

System of heating using regenerated energy along with that wasted in acceleration succeeds in Blackhall car. Manual control superimposed on automatic lends flexibility without interference with regular air braking

By A. W. *Baumgarten*
Division Engineer Chicago & Joliet Electric Railway, Joliet, Ill.



The heating tests were made on the car "Louis Joliet," which was exhibited at last year's A.E.R.A. convention

ELECTRIC heat in railway cars has long been considered the most desirable, but its cost has sometimes been considered prohibitive, particularly where the average winter temperature is less than 40 deg. F.

For this reason the Chicago & Joliet Electric Railway has for many years used fuel heaters in its city and interurban cars. Within the last few years a number of railway properties, such as the United Railways & Electric Company of Baltimore, the Twin City Rapid Transit Company, the Pittsburgh Railways, and others, have tried several plans of utilizing the waste energy of motor rheostats for car heating. Naturally, this afforded considerable reduction in heating costs, for the only additional cost is an investment in inclosed resistors which can be installed safely within the car. However, except in very mild climates, additional heaters using power from the trolley are needed in conjunction with motor rheostatic heating. With no additional heaters, in colder weather the operator would be tempted to run on resistance points to maintain a comfortable temperature in his car.

Some years ago the writer conceived the idea of utilizing waste energy of starting resistance losses for car heating, together with the much greater waste energy of braking. This necessitated the design of a dynamic braking system whereby the driving motors would become generators so that energy therefrom could be dissipated through the same motor rheostats. Although dynamic braking was not new the automatic control and use of this waste energy for car heating had not previously been used to any extent.

Same Contactors Used for Acceleration and Braking

This dynamic braking and heating scheme has been incorporated in the motor control of the new light-weight worm-drive car of the Chicago & Joliet Electric Railway that was exhibited at the Cleveland convention of the American Electric Railway Association last October. This car was put in regular city service in February.

Both motor acceleration and dynamic braking are controlled with standard remote contactors and a standard master controller. Only three additional contactors are needed for the dynamic braking. In braking and heating the contactors are actuated by an automatically controlled sequence drum that is interlocked with the motor controller and brake valve. This dynamic braking sequence drum automatically cuts out heater resistance as the car speed decreases. Its rate of movement is controlled by a current-limiting relay carrying the main generated current. This current-limiting relay prevents overloading of

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TABLE I—DYNAMIC BRAKING TESTS ON CHICAGO & JOLIET WORM-DRIVE CAR NO. 200, NOV. 16, 1927

M.P.H.	Time, Seconds	Maximum Volts, Two Motors	Amperes per Motor Average	Amperes per Motor Maximum	Weight of Car, Pounds	Braking, M.P.H.P.S.
22.5	11.50	...	81	120	26,100	1.96
22.0	9.80	...	82	120	26,100	2.25
12.0	5.33	...	85	140	26,100	2.25
21.4	8.98	...	96	132	26,100	2.39 *
21.0	7.77	...	104	140	26,100	2.70 *
20.0	7.57	...	93	132	26,100	2.65 *
13.0	6.82	340	78	140	26,100	1.91
12.7	5.98	340	79	140	26,100	2.12
20.8	7.90	545	100	132	26,100	2.63
21.7	8.33	545	95	132	26,100	2.60

* Maximum relay setting.

the motors while they function as generators during braking.

The starting and braking resistance units consist of edgewound resistors entirely inclosed in aluminum cases. These are placed under the car seats in box-type aluminum seat pedestals having louvers on all sides to allow free circulation of air. The seat pedestals prevent the passengers from placing their feet on these heaters, some of which reach quite high temperatures. A second set of open-type resistor units is placed under the car body for summer use when heat in the car is not desired. The change from inside to outside resistors is made by a six-pole, double-throw switch under the car. The aluminum cases of the heater resistors are grounded through a relay so that should any part of the resistor circuit open or become grounded the control circuit will be opened.

The motor equipment on this car consists of four 300-volt motors, with pairs connected permanently in series. This simplifies the dynamic braking control, for the load of the four machines, when acting as generators, can be divided equally by interchanging fields of the paired motors.

The dynamic braking action is governed by the standard safety-car control air valve in which there is an extra port between the release and air application positions of the valve. A circuit-closing air valve is connected to this port, so that when the car operator moves the brake valve to the proper position this air valve closes the dynamic braking control circuits. The remainder of the braking operation functions automatically. Any desired rate of braking can be obtained by changing the setting of the current-limiting relay.

Dynamic braking does not in any way interfere with air braking and, if desired, air braking may be used at the same time as the dynamic braking. Also, the car operator can at any time cut off the dynamic braking and reduce car heating by throwing a snap switch placed alongside the master controller. A manual control, obtained through a foot switch, is superimposed on the automatic control of the brake so that the car operator can stop the movement of the sequence drum and use as much or as little braking as desired. This manual control enables the operator to coast down steep grades using the dynamic brake without bringing the car to a stop.

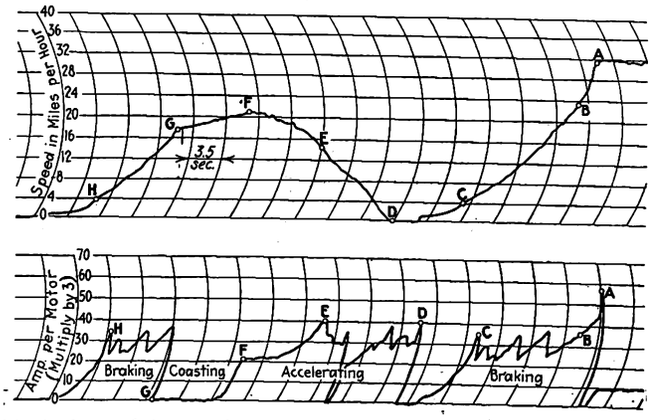
TABLE II—DYNAMIC AND AIR BRAKING COMBINED, WORM-DRIVE CAR NO. 200, ON NOV. 18, 1927

M.P.H.	Time, Seconds	Amperes per Motor Average	Amperes per Motor Maximum	Weight of Car, Pounds	Braking, M.P.H.P.S.
21.5	5.54	89.6	138	25,200	3.88
21.0	5.90	82.1	147	25,200	3.56
22.0	5.20	88.9	147	25,900	4.23
19.0	4.73	84.3	136	25,900	4.02
19.0	4.78	89.5	140	25,900	3.97
20.2	5.13	79.1	150	25,900	3.94
20.2	5.40	84.2	148	25,900	3.74
20.0	5.04	82.8	138	25,900	3.96

Previous to putting this light-weight car in regular service a long series of tests was made by engineers of the railway and the Westinghouse Electric & Manufacturing Company. The car was equipped with high-speed Esterline twin type graphic meters, recording simultaneously combinations of car speed and motor current, motor current and line voltage, and generator current and voltage. Indicating thermometers in the car and thermocouples installed in the motor windings determined the temperature. Recording watt-hour meters in the circuits recorded energy consumption and energy returned to the car in heating.

No Delay in Action of Dynamic Brake

Typical speed-time and current-time curves obtained during acceleration and dynamic braking are reproduced. At the right of point *A* on the curves the car was running at a speed of 32 m.p.h., with a current of 30 amp. per motor. Power was shut off with the brake valve in dynamic braking position. The time interval to obtain maximum dynamic braking, as indicated by the break in the motor-current curve, was only 0.65 second.



Typical speed-time and current-time curves with dynamic braking obtained in Chicago & Joliet tests. These curves, reading from right to left, show car speed and current per motor. Chart speeds in the tests were 3.5 seconds per vertical division

The points indicated at *A, B, C,* etc., on the corresponding curves are identical time points. No air braking was used except to stop the car after reaching a speed of less than 2 m.p.h. Although the speed of 32 m.p.h. at point *A* is abnormally high the maximum motor current in braking is only about 174 amp. The braking rate between points *A* and *B* is about 3.33 m.p.h.p.s., and between points *B* and *C* it is 2.03 m.p.h.p.s. As shown on the motor-current curve, the advance from each dynamic braking point to the next occurs at the same speed each time the car is stopped when the current relay setting remains fixed, and the rate of braking is always the same on level track.

The dynamic braking in all cases was extremely smooth, as can be noted from the speed-time curves. By setting up the current limiting relay, high braking rates were obtained without discomfort. The results of a number of tests using various speeds and relay settings are given in Table I. In a large number of tests where the average braking rate was 2.36 m.p.h.p.s., the average motor current was 87 amp., whereas the average motor current for the corresponding rate of acceleration is about 137 amp. On this basis the average braking currents are found to be about 63 per cent of those for average acceleration. The maximum voltage developed across two motors when braking from a speed of 28 m.p.h. was 545 volts, which is less than trolley voltage.

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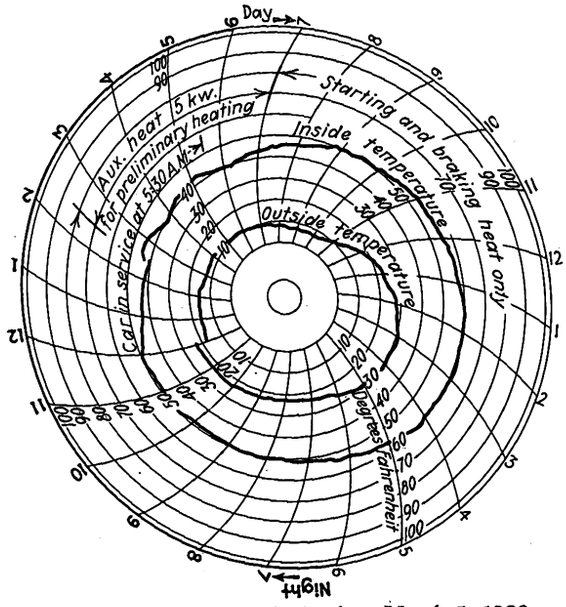
Table II shows results obtained when using dynamic and service air braking simultaneously. A maximum retardation of 4.23 m.p.h.p.s. was obtained without wheel slippage. On tests made with air braking only, such high rates of retardation were not possible, and wheel slippages occurred at rates less than those shown in Table II, even with sand on dry rails. The reason for such a difference would appear to be that air brakes cannot be adjusted equally on all wheels and, with the air braking, one or more pairs of wheels will slide at high braking rates. When using both forms of braking at high rates the air braking is only about 50 per cent of the total—not sufficient to slide the wheels—and the remaining 50 per cent of dynamic braking is fully equalized between all the wheels. In fact, tests on very slippery rails showed that with dynamic braking it was not possible to slide all the wheels at once; those that did slide started to turn again in a short distance. Better rates of retardation appear possible, consequently, on bad rail with dynamic braking.



Temperature curves obtained on March 5, 1928

Car was put into service at 5:30 a.m. after preliminary warming with auxiliary heaters. Resistors used for starting and dynamic braking then supplied sufficient heat to maintain an interior temperature approximately 30 deg. F. above outside atmosphere.

With thermocouples in the motor windings separated from the copper with only one layer of tape, tests were made on a predetermined schedule of six stops per mile. A six-hour run of a loaded car was made on a schedule of 11 m.p.h., using dynamic braking only. The same tests were repeated using air braking alone. With dynamic braking the maximum motor temperature was 83 deg. C., as compared with a maximum motor temperature of 73.5 deg. C. with air braking. These are practically hot-spot temperatures. Since the permissible temperature rise is about 100 deg. C., it is highly improbable that dangerous motor temperatures would be reached during winter as a result of dynamic braking. While not very accurately determined, due to the wide variation in voltage, the tests showed about 8 kw. was the average return of power, to which must be added the loss in the resistors from accelerating currents, or about 20 per cent of the total input.

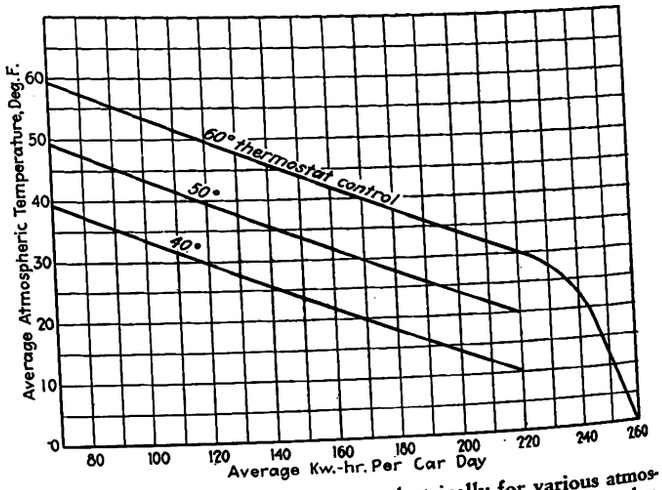
Since putting the car in regular service last February it has not been necessary to use any heating beside that derived from the dynamic braking and the accelerating resistance losses. The car is equipped with auxiliary heaters of 5 kw. capacity on a 50 deg. F. thermostat control. These are turned on about two hours before the car is scheduled to leave the barn to have it warm in the morning.

A typical temperature chart taken in the car while in regular service on March 5 is shown in the accompanying illustration. The outer curve is the recorded temperature inside the car, while the inner curve gives the outdoor temperature, plotted from a similar temperature record taken on the same day. The car was put in regular service at 5:30 a.m. with an inside temperature of 40 deg. F. obtained with the auxiliary heaters, and an outside temperature of about 12 deg. A temperature of 50 deg. and more was maintained in the car, using the starting and braking heat only, with an average outside temperature of about 20 deg. In general, it has been found that the average temperature rise obtained with dynamic braking and starting rheostat losses is about 30 to 35 deg. During stormy weather and when passenger loading is heavier, higher temperature rises occur. Except in extremely cold weather, the heat obtained from braking and starting is ample to maintain a comfortable temperature in the car.

Substantial Economy in Heating Obtained

Several years ago the railway operated a few cars with electric heaters on 60 deg. thermostat control. Meters were installed in the heater circuit of two of these cars and accurate records kept of the heating energy for two seasons. Table III shows the heating energy, the motor energy per car-mile and the average heating energy per car per season for the year 1924.

The upper curves in the accompanying chart were plotted from these records. The average kilowatt-hours per car per day based on the average atmospheric temperature are shown. The cars upon which these records were taken had a total heater capacity of 13 kw., which accounts for the sharp bend in the curve at 25 deg. atmospheric temperature. In other words, the 60 deg. thermostat would not cut off the heaters at all when the outside temperature was below 25 deg. The two lower curves indicate the calculated energy with thermostat control set to cut off at 40 deg. F. and 50 deg. F., respectively.



Energy consumption to heat city car electrically for various atmospheric temperatures and thermostat settings. The 60-deg. thermostat curve is from tests; 50 and 40 deg. curves are calculated

The comparative annual costs per car of electric heating and heating obtained from dynamic braking and

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starting rheostat losses is shown in Table IV. These costs will depend on average winter temperature, which in the latitude of Joliet is about 33 deg. The estimated saving of $300 per car per year with dynamic braking is conservative, as it includes only the energy cost. This method of braking during winter will also effect savings in brakeshoe wear and cost of collision accidents.

TABLE III—COST OF ELECTRIC HEATING ON CITY-TYPE DOUBLE-TRUCK CAR WITH 60 DEG. THERMOSTAT CONTROL

Month	Kilowatt-Hours Per Car-Mile Total	Motor	Heating	Heating per Day	Total Heat*	Average Car-Miles per Day
January, 1924	3.46	2.31	1.15	207	6,417	180
February	3.43	2.23	1.20	216	6,048	180
March	3.25	2.20	1.05	189	5,859	180
April	2.54	2.24	0.30	54	1,620	180
November	2.66	2.20	0.46	83	2,490	180
December	3.39	2.30	1.09	196	6,076	180
					28,510	

Average kilowatt-hours per car per day based on 150-day season.... 190 kw.-hr.

*Total heat is kilowatt-hours per car per season.

The electric heating energy cost has been based on the average charge per kilowatt-hour. As the maximum demand for heat invariably occurs during the peak, the cost of energy used for heating is higher because of the increased peak demand. Furthermore, the capacity of railway substation equipment must be sufficient to provide for this demand. If the average heater load per car is 12 kw. and substation equipment is valued at $60 per kilowatt, then the total electric heater investment would be increased by $720 per car. At 12 per cent interest and depreciation, the operating cost of electric heaters would be increased $86 per year. The total estimated saving through dynamic heating and braking may therefore be taken at approximately $400 per car per year.

TABLE IV—COMPARATIVE ANNUAL OPERATING COSTS PER CAR PER YEAR FOR HEATING

Electric Heating	
Energy cost, 28,510 kw.-hr. at 1.6 cents	$456
Interest and depreciation, 12 per cent	30
Maintenance	5
Cost of hauling 250 lb. at 4 cents	10
Total cost per car per year	$501
Dynamic Braking and Heating	
Interest and depreciation at 12 per cent	$106
Maintenance and inspection	25
Auxiliary heat power, 3,000 kw.-hr. at 1.6 cents	48
Hauling 525 lb. at 4 cents	21
Total cost per car per year	$200
Estimated saving per car per year	$301

Educational Opportunities in Los Angeles

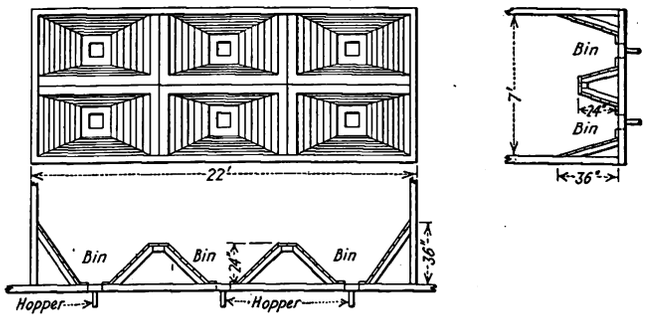
TWENTY-THREE years after the opening of the first courses in engineering at the University of Southern California, Los Angeles, Cal., a college of engineering has been created at that institution. The demand for engineering education in this section of the southwest and the need of industries in southern California for centralized and adequately-equipped engineering laboratories has led the board of trustees of the university to authorize this college. Philip S. Biegler, professor of electrical engineering at the university for the past five years, has been appointed acting dean by President Rufus B. von KleinSmid. From 1918 to 1921 he served as associate engineering editor of *Electrical World,* a McGraw-Hill paper.

This new college, which will open its doors in September, will be made up of five major divisions with separate chairmen. The divisions comprise chemical engineering; civil engineering; electrical engineering; mechanical engineering and petroleum engineering. In addition to the four-year courses leading to degrees of bachelor of science in any of the divisions of engineering, and master's degrees for graduate work, there has been established the degree of civil engineer for distinction in the practice of engineering.

Sand Car with Six Hopper Outlets

RAIL sanding equipment has received considerable attention the past year on the New York & Queens County Railway, Woodside, N. Y. Simplification of the rail sanding methods and continuity of sand flow have been considered of such importance that a special sanding equipment was designed and constructed in the shop. A second-hand single-truck passenger car was purchased and stripped of all internal fittings. All glass was removed and the windows boarded with ½-in. x 6-in. material from the sill to the letterboard. Necessary changes were made on the end and window posts to obtain a neat appearing and weatherproof job. Suitable solid sliding windows were left in the sheathing to permit of filling the car with sand.

Six sand bins approximately 3½ ft. wide by 7 ft. long by 2 ft. high were erected from 2-in. x 4-in. timbers and the sides were tapered to afford a minimum of friction to the sand flowing by gravity to the hopper located in the bottom of each. These frames were covered with 1¼-in. spruce which was ship-lapped 1¼ in. on each end to minimize leakage. All were painted with two coats of heavy metallic red paint. The capacity of each bin is approximately 1.5 cu.yd. of dry sand.



Bin arrangement in sand car

The bins are equipped with Brill dump-it type sand hoppers and have spouts in front of and between the wheels directly over each rail. Three operating levers are installed on the front and rear platforms. Two of these levers control the sand flow in front of the leading wheels and the other controls one in the center. They are held in a latched position by a notched circle plate, thus permitting any desired degree of sand flow. The operating levers normally are held in the off position by a heavy coil spring attached to the lower extremity of the lever. This multiplicity of sanding outlets has eliminated the constant shoveling of sand into the hoppers, decreased the possibility of failure and permits the operator to see the results obtained by the sanding equipment.

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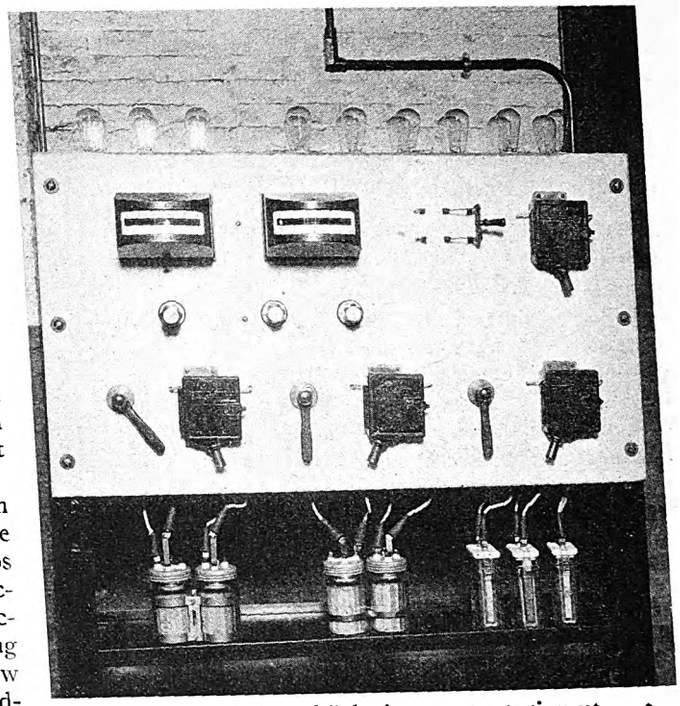
Lightning Arrester Testing Set

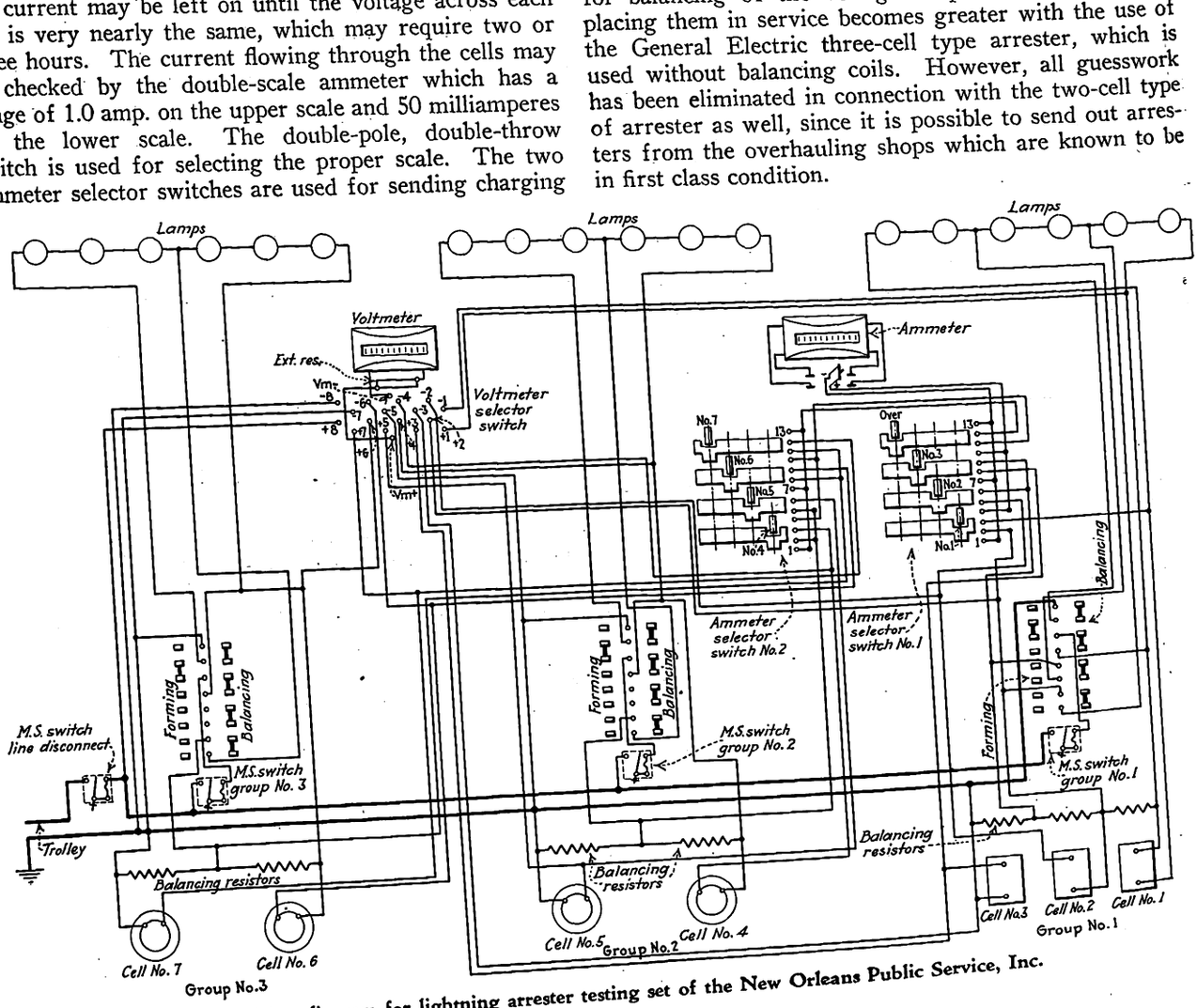
By Jeff Ruck
Engineer Rolling Stock and Shops Department, New Orleans Public Service, Inc., New Orleans, La.

CHARGING and balancing lightning arrester cells of the electrolytic type, as used by the New Orleans Public Service, Inc., is done with a testing set whose general layout and connections are shown in accompanying illustrations. Three groups of cells may be handled at one time. In the halftone shown the Westinghouse two-cell type is on the left, the General Electric two-cell type in the center, and the General Electric three-cell type on the right. Each group is controlled by the switch directly above it. The entire set may be disconnected from the power supply by the switch at the upper right corner of the switchboard.

When preparing a cell for service, a protecting film must be formed on the plates. To do this the reverse handle is moved to the left, thereby placing the six lamps in series with the cells. After from ten to twenty seconds the reverse handle may be moved to the right, placing the cells in parallel with the lamps and balancing coils. The condition of balance of the cells may now be determined by using the voltmeter and taking a reading across each cell. The true voltage is secured by multiplying the readings by four. Usually the cells are not balanced with respect to each other, and the balancing current may be left on until the voltage across each cell is very nearly the same, which may require two or three hours. The current flowing through the cells may be checked by the double-scale ammeter which has a range of 1.0 amp. on the upper scale and 50 milliamperes on the lower scale. The double-pole, double-throw switch is used for selecting the proper scale. The two ammeter selector switches are used for sending charging or balancing currents through the ammeter. The need for balancing of the voltage drop across cells before placing them in service becomes greater with the use of the General Electric three-cell type arrester, which is used without balancing coils. However, all guesswork has been eliminated in connection with the two-cell type of arrester as well, since it is possible to send out arresters from the overhauling shops which are known to be in first class condition.



General view of lightning arrester testing set



Wiring diagram for lightning arrester testing set of the New Orleans Public Service, Inc.

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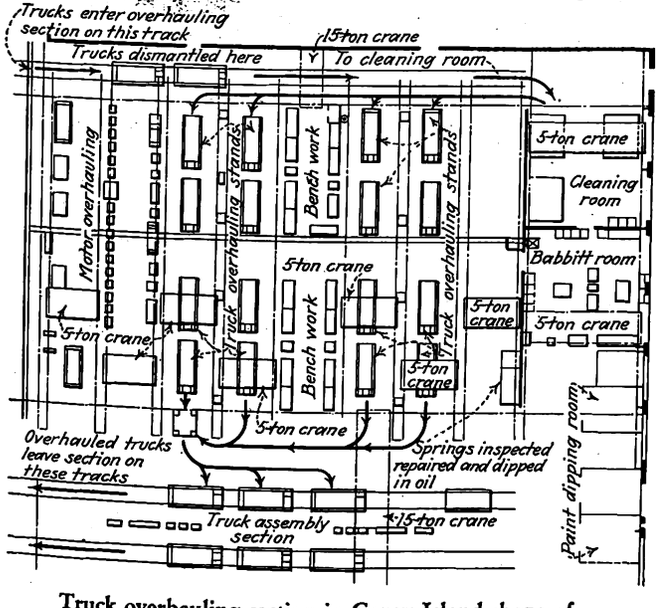
Truck Overhauling Systematized in Brooklyn

In the Coney Island shops of the Brooklyn-Manhattan Transit Lines car trucks are brought in on a dismantling track and go out on assembling tracks. Between and perpendicular to these tracks are eight bays used for inspection and repair work

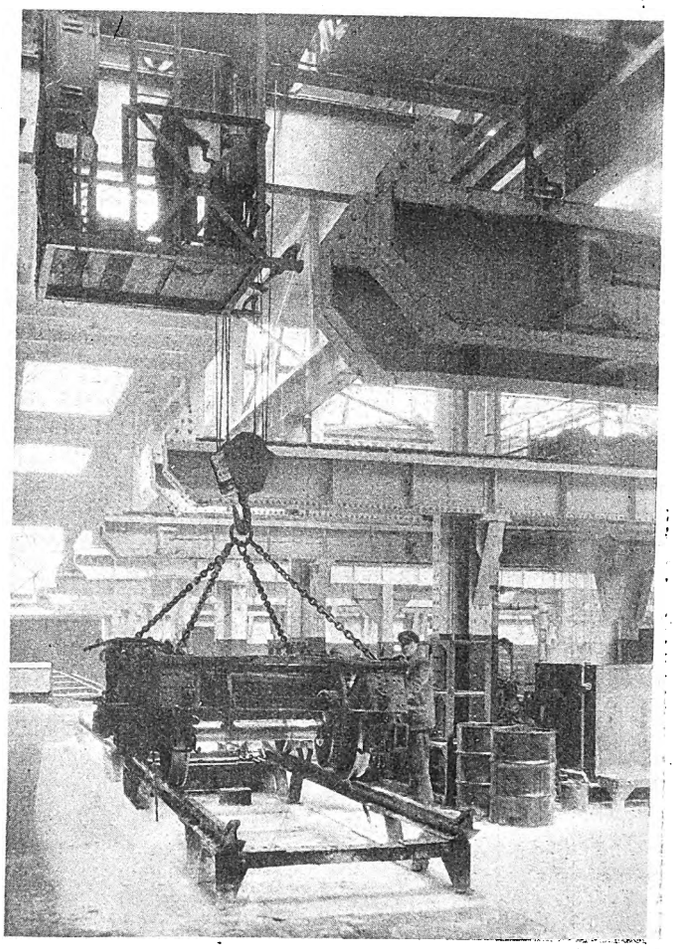
By Clarence W. Squier
Associate Editor *Electric Railway Journal*

CONTINUOUS flow of the work along definite paths is an outstanding feature of the truck overhauling plan carried out in the Coney Island shops of the Brooklyn-Manhattan Transit Lines. The large volume of work handled permits specialization of the various subdivisions to a degree not found in many electric railway shops. Flexibility, so important in this class of work, results directly from the "spot" system used, in which truck frames are placed on stands in definite positions for various jobs, such as stripping, repairing and building up.

Some 20,000 sq.ft. of floor space in the central part of the large main repair shop is devoted to truck overhauling. On the west side of this section the trucks are brought in on one track and dismantled, and on the east side the trucks are assembled and returned to the car bodies on two similar tracks. The space between is divided into eight bays devoted to the detailed inspection and repair of the various parts after they are dismantled. Seven of these have 5-ton overhead traveling cranes controlled from the floor. A 15-ton overhead traveling crane serves the dismantling track and another traveling crane of the same size serves the two assembly tracks.



Truck overhauling section in Coney Island shops of Brooklyn-Manhattan Transit Lines



Dropping out wheels and journal boxes while the truck frame is lifted and carried by overhead crane to the cleaning room

Trucks are brought into this section of the shop for overhauling every two years. Intermediate and running repairs are made in another section. During the intervening two-year period it frequently happens that trucks are changed, so that when the car comes in for its next overhauling it may have different trucks from those with which it went out originally. In that event the trucks which are under the car when it comes in for repairs are sent to the intermediate truck repair section, and those which were under the car when it went out originally are removed from other cars in the intermediate truck repair section and are sent to the truck overhauling section for the regular scheduled inspection and repair. The procedure insures that trucks are overhauled on their regular schedule and gives increased flexibility to intermediate repair work.

When cars are brought into the repair shop they come in on the track on the west side, which extends into the truck overhauling section. After the car body is lifted off, the trucks are pushed by storage-battery tractors into position on the dismantling track in the truck section. Provision has been made for future installation of control equipment so that trucks can be run under their own power into and out of this section. The proposed equip-

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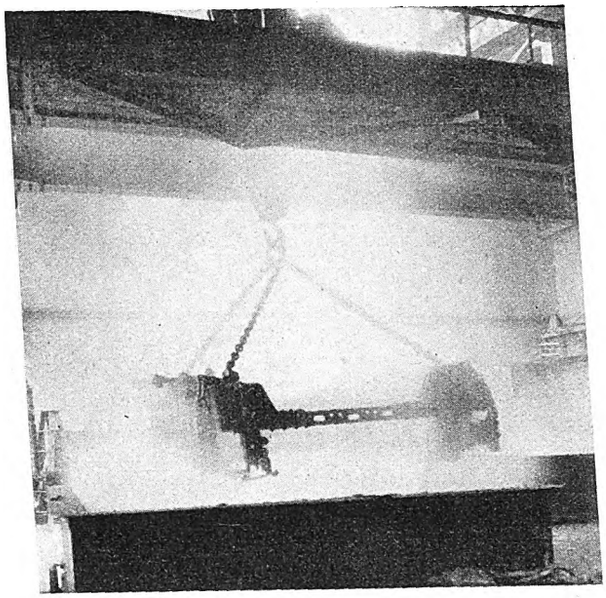
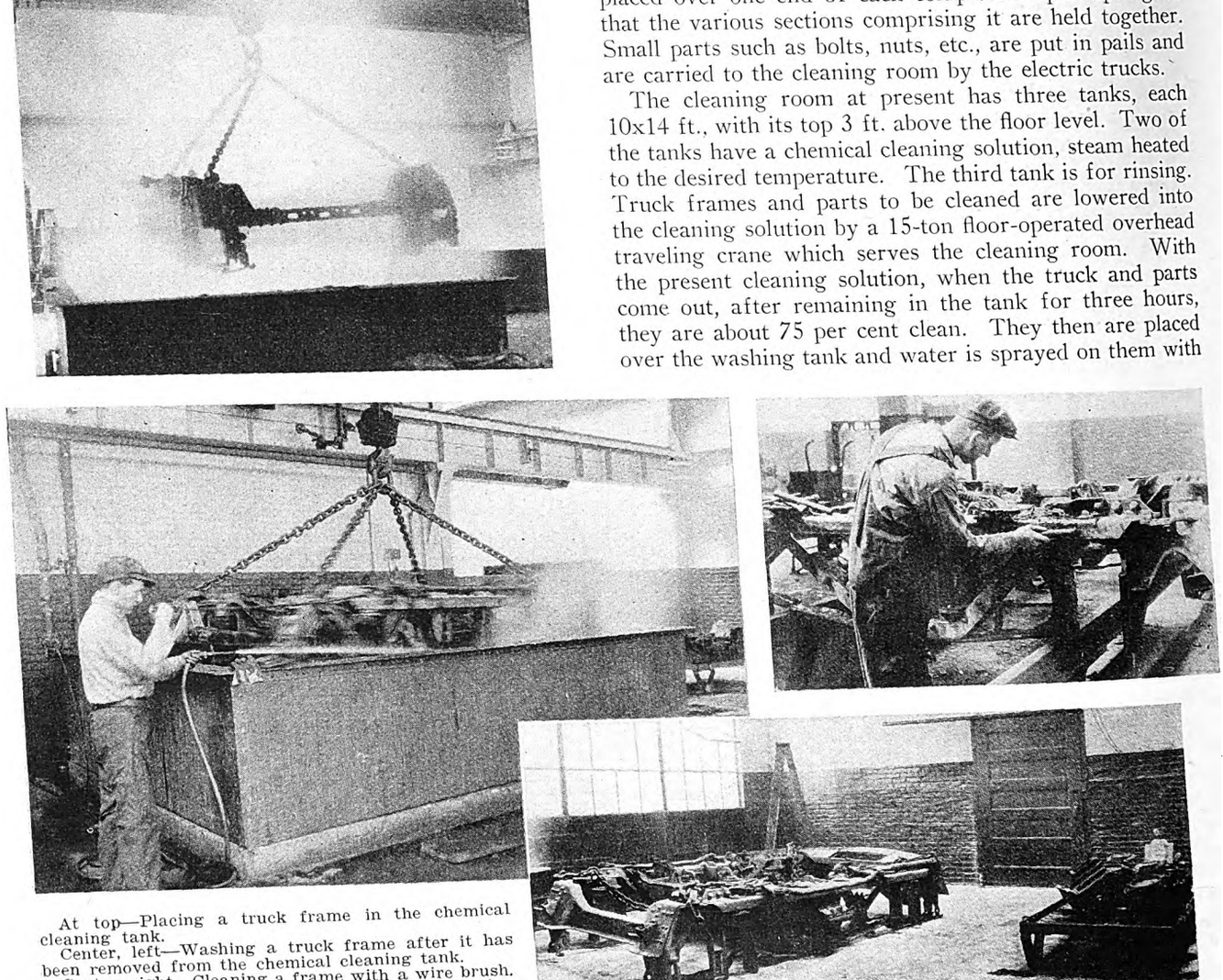


bolsters, journal boxes, bottom brake rods, miscellaneous hangers and brake rigging parts, spring planks, radius bars and elliptic springs are placed on large trays with legs to raise them off the floor so that an elevating truck platform can be run underneath for raising and transporting this material to the cleaning room. A clamp is placed over one end of each complete elliptic spring so that the various sections comprising it are held together. Small parts such as bolts, nuts, etc., are put in pails and are carried to the cleaning room by the electric trucks.

The cleaning room at present has three tanks, each 10x14 ft., with its top 3 ft. above the floor level. Two of the tanks have a chemical cleaning solution, steam heated to the desired temperature. The third tank is for rinsing. Truck frames and parts to be cleaned are lowered into the cleaning solution by a 15-ton floor-operated overhead traveling crane which serves the cleaning room. With the present cleaning solution, when the truck and parts come out, after remaining in the tank for three hours, they are about 75 per cent clean. They then are placed over the washing tank and water is sprayed on them with a hose, the nozzle of which has a metal scraper at the end so that accumulations of grease and dirt can be loosened readily.



At top—Placing a truck frame in the chemical cleaning tank.
Center, left—Washing a truck frame after it has been removed from the chemical cleaning tank.
Center, right—Cleaning a frame with a wire brush.
At bottom—A truck frame and stand containing journal boxes after they have been removed from the cleaning tank.

ment consists of contactors and resistors controlled from push-button stations alongside the tracks. A single lead will supply power to the truck to be moved.

Stripping of Trucks Is Done Rapidly

As soon as the truck is run in, all large parts are loosened and the 15-ton traveling crane over the incoming track is used to lift off removable parts, such as the motor, gearcase, bolster, elliptic springs, spring plank, radius bar and shoe beams. Motors enter the motor overhauling section immediately adjacent to the track on which the trucks are stripped. The journal boxes, with wheels and axles, are left on the track as the truck frame is lifted and carried to the cleaning room by the crane, after which they are moved to the wheel and axle shop. Waste and oil are removed from the journal boxes and are placed in large drums, which when filled are transported by electric tractors to the waste and oil reclaiming department.

The larger parts removed from the truck, such as

After this cleaning, the trucks and parts are returned to the section between the incoming and outgoing tracks and are placed on assembling stands which raise the truck frame up to a convenient height for the workmen. The general type of truck overhauling stand used in the B.-M.T. shops was described in Electric Railway Journal for May 19, 1923, page 853. Those used in the Coney Island shops have locked chests for tools extending across one end. The workman has one key and the foreman a duplicate.

Testing for Defects Is Done Thoroughly

In the overhauling bay, truck frames are cleaned with a wire brush. An inspector goes over them carefully to discover cracked parts, loose rivets and worn parts which are to be replaced. He indicates any changes in construction that are to be made. The practice of the com-

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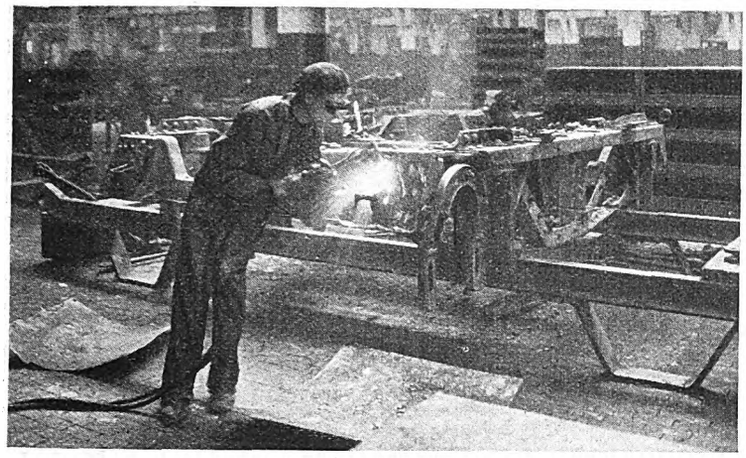
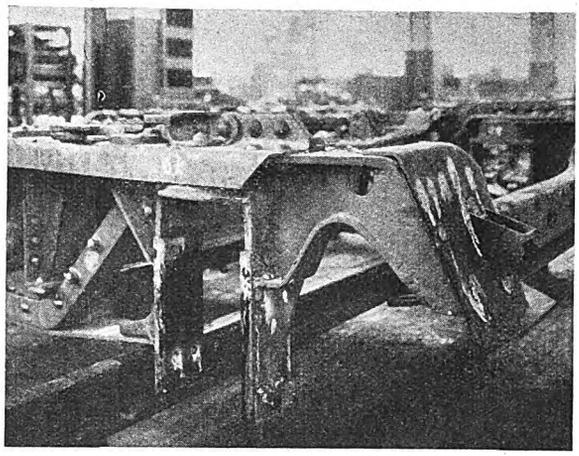
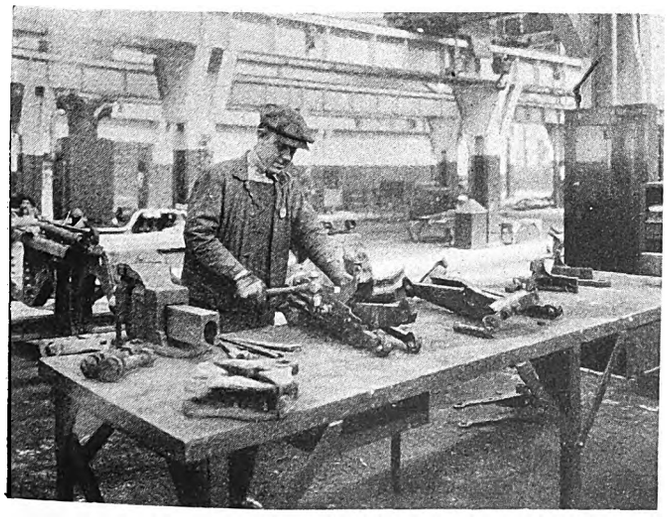




At left—Cutting off heads of rivets to loosen parts that require replacement. At right—Truck frames with parts marked in chalk for replacement and rivet heads cut off so as to loosen parts that are to be removed

pany is not only to put the trucks in as good condition as they were when new, but to incorporate any improvements in material or design that are available. Some of the changes that are now being made during overhauling are the installation of manganese wear plates on journal boxes and pedestals, installation of new end frames, new spring plates and Potter end castings on elliptic springs. The inspector chalks with X marks the parts which are to be taken out and replaced. Parts which in general are being replaced, but which will not be changed on a particular truck are marked O.K. with chalk. For instance, the installation of manganese wear plates has been going on for some time. On some of the trucks that come in the replacement already has been made. The inspector tests the plates with a magnetized iron bar, as manganese steel is non-magnetic, to determine whether the plates are to be replaced or not. He detects cracks in gusset castings which it would be impossible to see without the thorough cleaning to which the trucks are subjected. All defective material is indicated for removal.

After the inspection all rivet heads are burned off with an oxy-acetylene cutting torch if the rivets need replacing or if it is necessary to loosen parts that must be removed. Where cracks in large parts are found, these are burned out to determine their depth and to see if a satisfactory weld can be made. After the heads are cut off, the rivets are driven out with an air punch.



Dismantling brake rigging at a bench

Following removal of defective parts or those which are to be replaced, the new material is installed. New parts are held with rivets if this was called for originally. For this purpose there are several rivet-heating furnaces which can be moved alongside the work for the convenience of workmen. In assembling, all joints are coated with red lead. After the new parts have been attached, the truck is placed over a test jig to make certain that the pedestal jaws line up and have proper clearance. The present practice is to have the jaws $\frac{1}{16}$ in. wider apart than the journal boxes.

Individual Parts Are Brought Back to Standard Dimensions

All of the material removed from the trucks goes to adjacent benches or departments for dismantling and individual repairs. Brake rigging, for instance, is taken to a bench and completely dismantled. Worn holes are filled in by electric welding and are redrilled. Worn surfaces are also built up and finished to size. This includes such parts as live and dead leaders, motor nose suspensions and shoe-head hangers.

Journal boxes are taken to the blacksmith shop after they come out of the cleaning tank. The old liners for the pedestal ways are removed and the boxes made ready for installation of new ones. From the blacksmith shop they go to the machine shop and are assembled ready for installation in the truck. New torsion springs are installed for the journal box lids. As these require a little more clearance than the springs previously used, a recess has to be cut with the oxy-acetylene torch. The old wear pieces are taken off journal bearings, which then go to the babbitt room, where they are rebabbitted. A new wear piece is then installed and they finally are finished to proper dimensions.

One section of the shop is devoted to inspection and repair of springs. The truck elliptic springs have six sections. After being cleaned with a wire brush, each is inspected carefully for broken leaves. After defective parts have been replaced, the assembled springs are dipped in an oil bath and placed on a rack to drain. Motor nose suspension springs go through the same process.

Assembling Is Done on Stands

After everything except the larger parts has been assembled, the truck frames are brought to the truck assembly track and have the journal boxes, wheels and axles placed under them. They then rest on elevated

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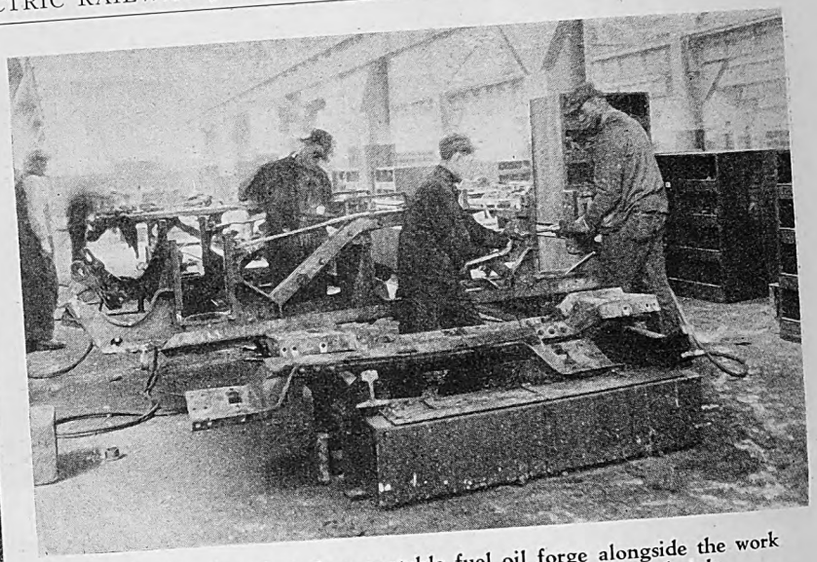


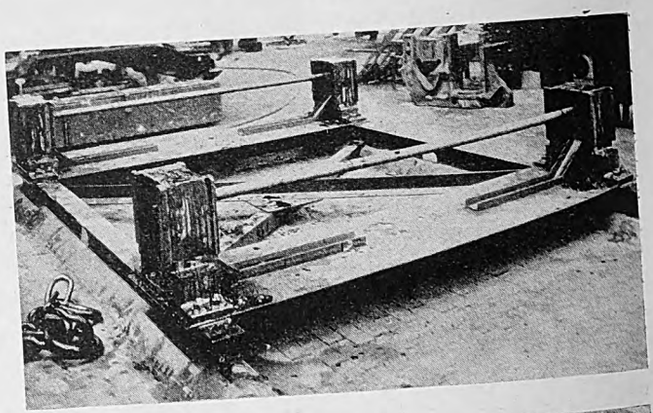
At left—Heating rivets in a portable fuel oil forge alongside the work
At right—Riveting new manganese wear plates to truck pedestals

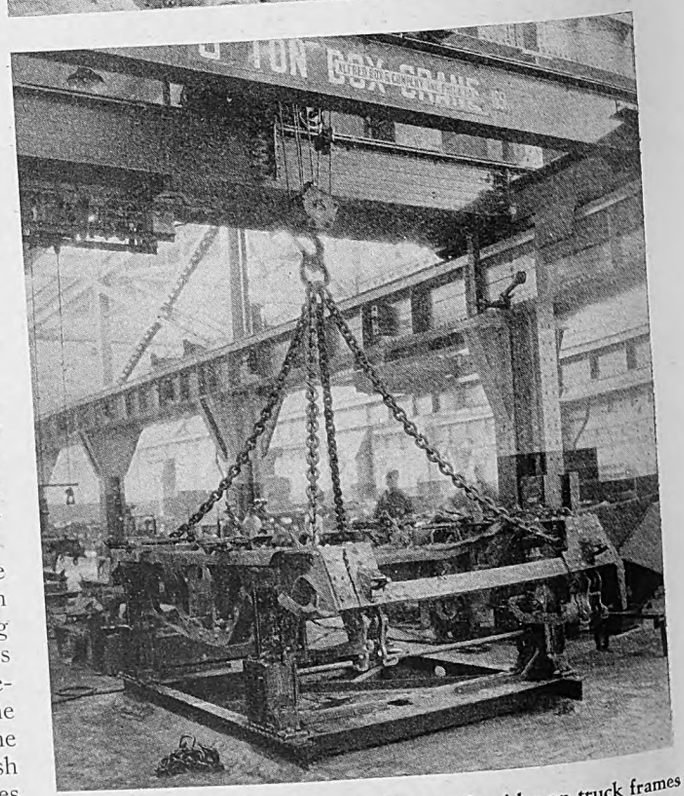
stands while the remaining work is going on. Repair bolsters, elliptic springs, spring planks, radius bars, etc., are installed, and motors with gearcases, axle caps, etc., are put in place. The truck frames are sprayed with one coat of black paint before the assembling commences and with another coat after it is completed. The work goes on before the first coat is dry. Dipping tanks and draining racks will be installed later, so that trucks can be dipped in paint at the beginning and end of the assembling instead of paint being sprayed on.

After final adjustments have been made, the trucks are run back to the car repair shop for placing under the car bodies. High-voltage tests and running tests are given the equipment after it is installed in the cars.

The present schedule requires that nine cars be completed each $5\frac{1}{2}$-day week, which means that eighteen trucks must be overhauled in the same time, or a maximum of four per day. More than four trucks at a time are being handled, since otherwise one set of workmen might interfere with another. In the overhauling bays are a large number of repair stands on which rest trucks in various stages of repair. The man doing a particular job moves from one truck to the next and completes his work, and then another follows along. This makes the system very flexible and enables the work to be done with surprisingly few workmen. One man is sufficient to do most of the jobs. Of course this could not be done were it not for the ample facilities in labor-saving equipment in the shop.

When the truck comes into the overhauling section, one man dismantles the large parts with the aid of a man in the overhead crane. There is but one man in the cleaning room. The dismantling of brake-rigging parts, such as live and dead levers, motor nose suspensions, and shoehead hangers, is done by one man, who also carries the parts to the benches. There another man dismantles the various parts and does the bench work. The wire-brush cleaning is done by one man, and one inspector locates defects and looks after parts to be replaced. He tests all rivets with a hammer, and marks any blowholes which





At top—Jig for testing trueness of pedestal guides on truck frames
At bottom—Placing a truck frame on the testing jig

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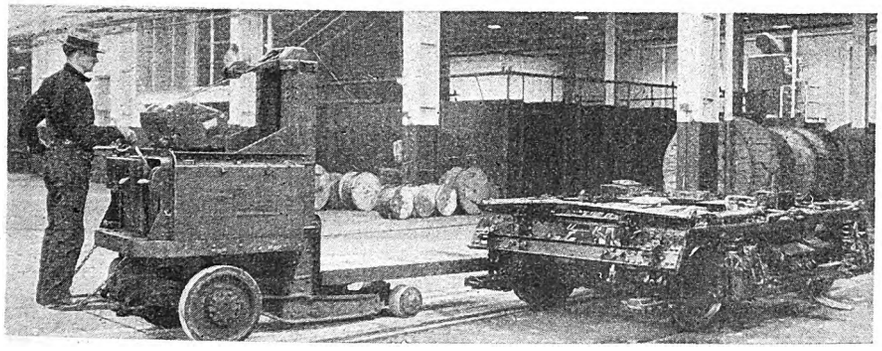
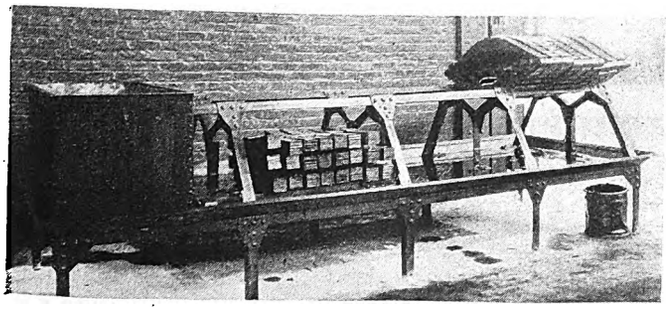
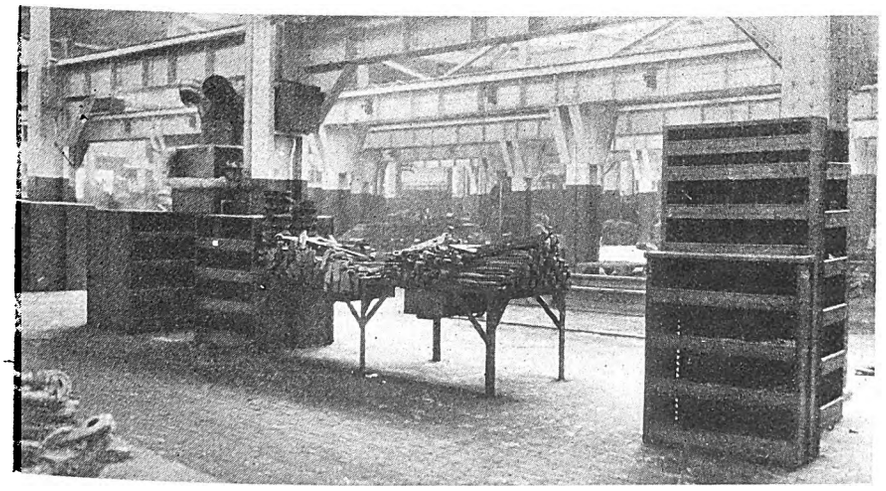


At top—Truck assembly section—bolsters, springs, motors, shoe beams, etc., are placed on trucks here
At bottom—Pushing an overhauled truck by means of an electric tractor out of the overhauling section for placing under car body



Dipping tanks and draining racks for springs
The tank at the left contains oil in which the springs are dipped. A quantity of motor suspension springs are shown in piles on the draining basin; at the extreme end of the rack are three elliptic springs.



Free stores are located immediately adjacent to the truck overhauling section. Small parts are kept in bins and larger parts in racks

might be dangerous and require filling up. One man with a blow torch loosens all defective parts, while a machinist with one helper puts on the new ones. A crew of three men do the riveting. One heats the rivets, one operates the air riveter, and the other holds on. Where a rivet hole is too large, or oblong, a welder fills it up and then it is redrilled with an air drill. One man puts on small parts, such as brake-rigging springs. A total of four men do the bench work and inspect various detail parts. On the general assembling track where four trucks are being worked on at the same time, only four men with two helpers are needed.

In the layout of shop equipment and facilities particular attention has been given to prevent unnecessary movement of the workmen in obtaining material for the repairs, in handling it to the job and in the use of any hand tools needed for the work. The material and spare parts for truck repairs are kept on racks and in steel bins and cabinets alongside the work. No order forms or requisitions are used for obtaining parts from these free stores. Most of the parts are of such a nature that there is no temptation toward theft and parts that are of brass or copper are kept in locked cabinets.

Small parts such as bolts, nuts, rivets, etc., are kept in steel cabinets with bins of convenient size. The practice is to replenish material from the general storeroom or from departmental stores at frequent intervals and about one week's supply is kept on hand in the truck overhauling section. This method also provides a convenient check of the material on hand or which may be needed in the immediate future. It also insures that the material is at the spot ready for use as required.

Portable hand and air tools such as riveters, punches, drills, chisels, etc., are issued to workmen on a check system. Each workman has a tool box right at his job to hold his tools, and he can lock it to make sure that the tools are always in place when they are needed. Duplicate keys to all lockers are in charge of the general foreman of the section.

The section is also provided with waste bins and receptacles for parts which are to be moved to other sections of the shop for reclaiming or repairs. All bins and receptacles are of such a form that they can be picked up quickly by an elevating platform truck and moved swiftly and without confusion. The section is also equipped with several inclosed urinals but near the work so no time is lost and workmen have no excuse for leaving the section when work is in progress. All these facilities help to speed up work and insure that highest efficiency is maintained.

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Oil House for Denver Tramway

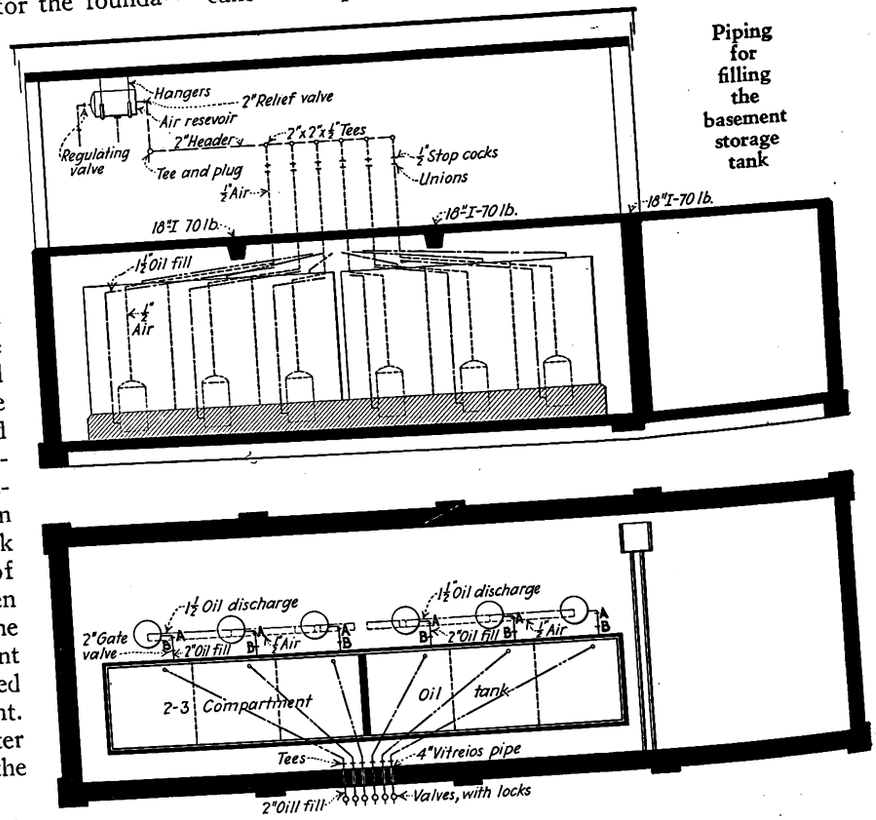
By H. L. Minister
Denver, Col.

IN THE DESIGN of a new oil house for the Denver Tramway attention was given to future as well as to present needs. The location was an old river or lake bed; therefore precautions were needed to prevent entrance of water. This also made the excavation difficult and increased the cost. In digging for the foundation a good grade of sand was encountered, a portion of which was used in the concrete for the building. This sandy soil and gravel bed necessitated the use of sheet-piling and also required the handling of more dirt, both in excavating and in backfilling.

On completion of the excavation a heavy reinforced-concrete mat used to insure a firm foundation and avoid settling on account of shifting of the sandy soil was first put in. Next the reinforcement for the concrete walls and pilasters was inserted and they were poured. This reinforcement consisted of old steel rails and wire mesh. Allowance was made for ties and bonds between sub-floors or mat and the main floor, sump, walls and concrete tank foundations. Approximately ½ in. of bituminous cement was poured between the finished floor and the mat and in the various ties. To make the basement watertight the outside wall was painted with a heavy coat of bituminous cement. This was necessary, as during high water the water level would be above the basement floor.

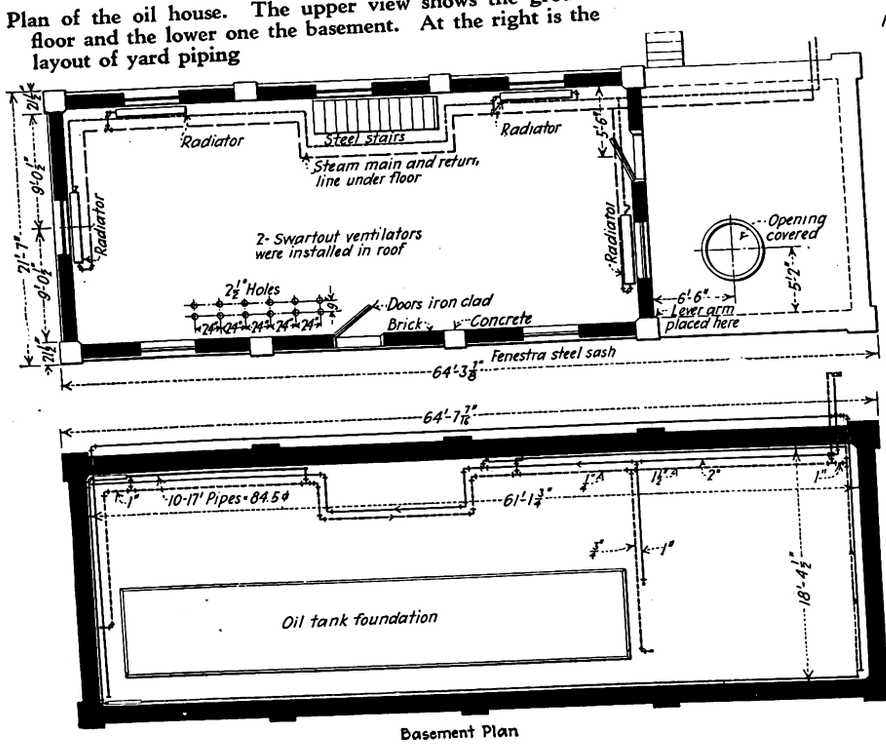
A car repair shop, an inspection shop, a paint shop and a power house are convenient to the oil house, so that air and steam were supplied from the compressors and boilers in the shop. The oil house is fireproof. For protection of its contents there is a high-pressure steam line laid in half-section porous tile connecting perforated lengths of pipe and running along the ceiling of the basement. The oil tanks are located in the basement. The main steam valve of this line is on the outside of the building.

In equipping the oil house an oil-reclaiming waste vat, filter tank, waste-saturating tank and dirty oil waste cans were placed on the first floor. Separate oil-air

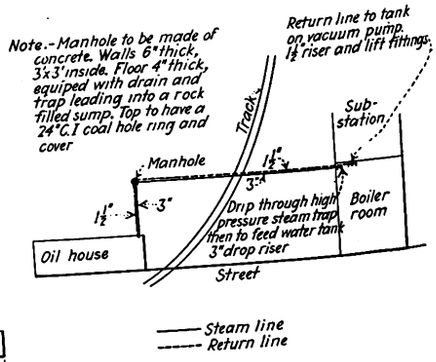


Piping for filling the basement storage tank

Plan of the oil house. The upper view shows the ground floor and the lower one the basement. At the right is the layout of yard piping



Basement Plan



pumps with automatic governing devices were originally called for but later were replaced with an air tank, as shown in the accompanying illustration. Oil runs by gravity from tank cars to the two large three-compartment oil tanks in the basement. Likewise oil flows by gravity from these compartments to the small individual tanks.

The oil house is arranged so that one man can take care of it. Lighting fixtures and wiring are vapor proof.

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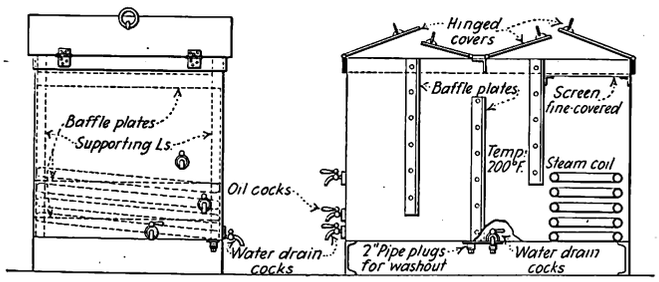


Settling and filtering tanks

The oil house is covered with magnesite stucco both inside and outside, the inside finishing coat being made with white portland cement.

Water is brought to the oil house from the boiler house and shops. The steam line was laid in half-section vitreous pipe and covered with Johns-Manville pipe-covering material. A swinging lever arm placed in the outside wall over the open platform has a block and fall to raise and lower material from and to the basement. This platform is at car height.

Block for Running in Bus Engines

By F. J. Foote

Superintendent of Motive Power and Equipment, Dayton & Columbus Transportation Company, Springfield, Ohio

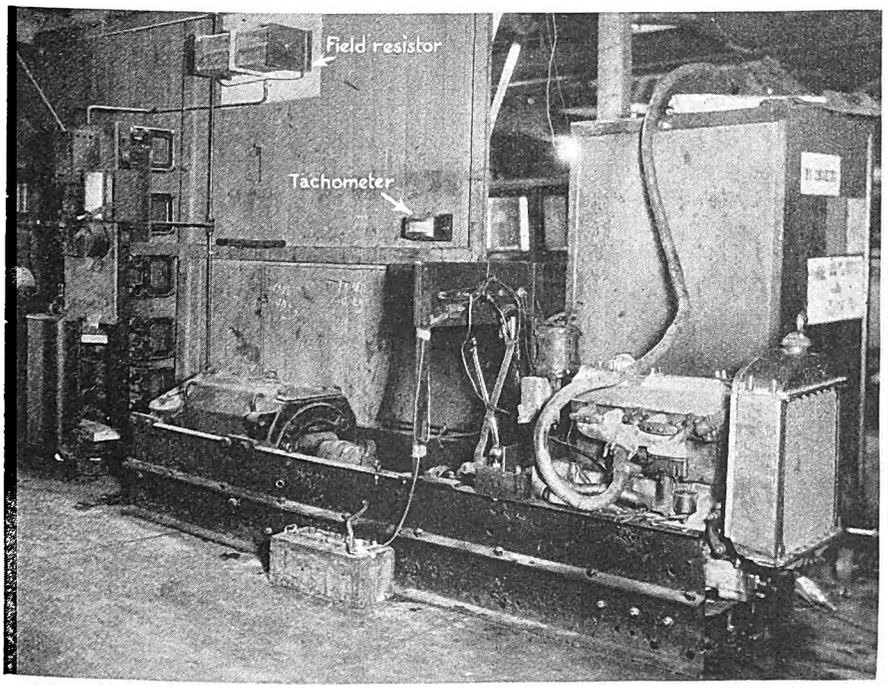
FOLLOWING an overhaul, the bus engines of the Dayton & Columbus Transportation Company, Springfield, Ohio, have the bearings, piston rings and cylinder walls smoothed up by giving the engine a running test while being driven by a motor. The base of the test block is made up of structural shapes so that an engine can be placed in position quickly. A retired railway motor is used to drive the engine. The original field has been replaced by a shunt winding.

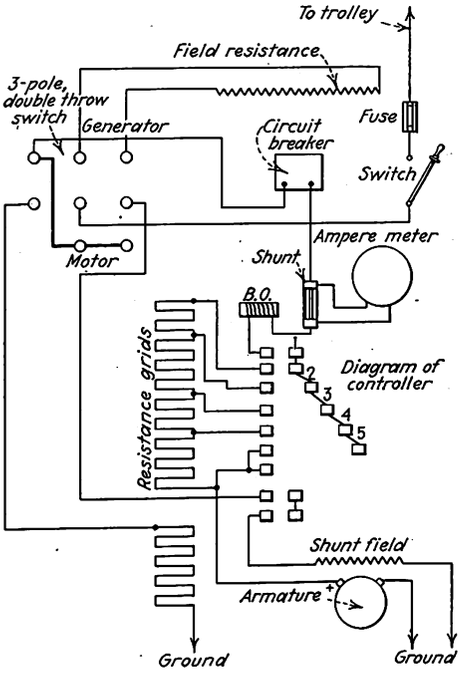
The control equipment includes a modified K-10 controller, resistors for the armature circuit which are standard car equipment grids, field resistors made of headlight resistance, an ammeter from a substation switchboard, a circuit breaker retired from a car, together with necessary switches and fuses. The accompanying diagram shows the connections. All overhauled bus engines are put on this block and are driven at a speed of about 500 r.p.m. till bearing surfaces are smoothed up. This is indicated by the gradual lowering of the running temperature. It requires from five to eight hours. After this test the gasoline and exhaust connections are made, and the engine is started by means of the motor. The three-pole, double-throw switch shown in the diagram is then thrown over, so that the motor acts as a generator and furnishes the load for running the engine under its own power. The engine is operated for some four to six hours, driving the generator, whose load can be regulated with the controller.

Practically all the parts used were discarded material picked up at the railway company's shop. Data covering resistances, field winding, etc., are not included, as these depend on the size and type of motor used. A motor smaller than 50 hp. should not be employed.

An examination of the diagram shows that, as a motor, the machine operates with the field connected directly from trolley to ground without resistance, and with the lower section of armature resistors cut out. As a generator, it operates with a resistance in the field circuit to hold down the generated voltage, and both upper and lower sections of the armature resistors are in circuit to hold down the load. The armature is then entirely disconnected from the trolley. The reverse drum of the controller is not used, and not all of the main contacts.

A magneto mounted on the motor frame and belted to the armature shaft is connected to an a.c. voltmeter and calibrated to read r.p.m. of the motor armature. This equipment has enabled us to put bus engines in dependable condition. We feel that the wearing in of bearings, rings and cylinder walls without using fuel, and therefore holding down the temperature at the most critical period is of particular advantage.





Test block for running in bus engines and diagram of connections for the various equipment used

The three-pole, double-throw switch should be down when the machine is run as a motor and up as a generator. The resistance shown at the top is in series with the field when the machine is used as a generator.

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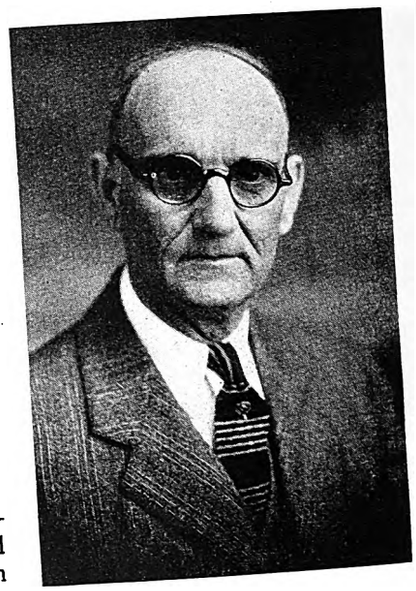
J. A. McCartney

Wins Maintenance Prize for March

Mounting for shovel truck receives award. Charles Herms given honorable mention for method of broaching brush-holders



CONVENIENT mounting for an electric shovel truck somewhat simpler and less expensive than the usual caterpillar type, which was described by J. A. McCartney, superintendent of construction, Pittsburgh Railways, Pittsburgh, Pa., was awarded the $25 monthly prize for March. The novel feature of the device consisted of a pair of axles with ends extended so that they rest outside of the excavated portion between tracks.

Honorable mention for March was awarded to Charles Herms, general foreman San Diego Electric Company, San Diego, Cal., for the description of his method of broaching worn brush-holders. Wear of brush-holders from the carbon brushes cannot be prevented, but the method described by Mr. Herms gives maximum life from these parts.

J. A. McCartney

who won the monthly prize for March in ELECTRIC RAILWAY JOURNAL'S Maintenance Contest, is superintendent of construction for the Pittsburgh Railways, Pittsburgh, Pa. When the railway went into the hands of receivers some years ago, he was chosen to organize a construction division of the way department for the purpose of rehabilitating the tracks, which then were in very bad condition. This organization began to function in 1919 and since that time has been rebuilding approximately 35 miles of track each year. One of the practices inaugurated by Mr. McCartney was that of setting up schedules for starting and finishing dates on each job. This permits municipalities which are affected by the reconstruction work to arrange their contract letting so that no delay occurs when the flanks of the street are to be rebuilt. It also permits the traffic department to arrange and take care of traffic problems.

The first electric railway experience of Mr. McCartney was with the Second Avenue Passenger Street Railway of Pittsburgh on its engineering corps. When this company was merged with the United Traction Company he continued in the engineering department as transit man and draftsman. Upon the merger of this company with the Philadelphia Company he continued in the engineering department in general engineering practice, power house design, transmission lines, street railway extension, etc. He became supervisor of tracks in 1915.

MAINTENANCE CONTEST

Extended Three Months

MAINTENANCE men with knowledge of improved methods or devices which may win a $25 monthly prize in ELECTRIC RAILWAY JOURNAL'S maintenance contest have three more months to send in their ideas. The time limit for submitting items, which previously was set as April 30, has been extended up to and including July 31.

Instead of confining the publication of articles submitted in the contest to the third issue of ELECTRIC RAILWAY JOURNAL each month, they will be published in other issues also. The prize winner each month will be selected from the items published that month. This change was found desirable as some of the articles sent in do not make up readily into the Data Sheet size used for items in the third issue each month. Also, some contestants submitted so many items that not all could be published in time to be considered by the judges for a prize if publication was confined to but one issue each month.

The following are the revised conditions for submitting material in the contest.

1. Any employee of an electric railway or bus subsidiary may compete.
2. The author does not need to be the originator of the idea.
3. Articles may be submitted by several persons or by a department.
4. Any maintenance practice or device for electric railway or bus repairs may be submitted.
5. Articles should be 100 to 200 words long, with one illustration, and in no event longer than 400 words with two illustrations.
6. Illustration material may be in the form of drawings, sketches, blueprints or photographs. All sheets should be marked "Maintenance Competition."
7. Manuscripts should be mailed to the Editor of ELECTRIC RAILWAY JOURNAL, 10th Avenue at 36th Street, New York, N. Y.
8. A prize of $25 will be awarded each month for the best maintenance idea in the group published during that month. A minimum of $5 will be paid for each article accepted for publication. Manuscripts will be received until July 31, 1928.
9. Announcement of the winner each month will be made in the issue devoted to maintenance and construction (the third issue each month) following the month in which the article was published.
10. Additional details were given in ELECTRIC RAILWAY JOURNAL for April 16, 1927, pages 700-701.

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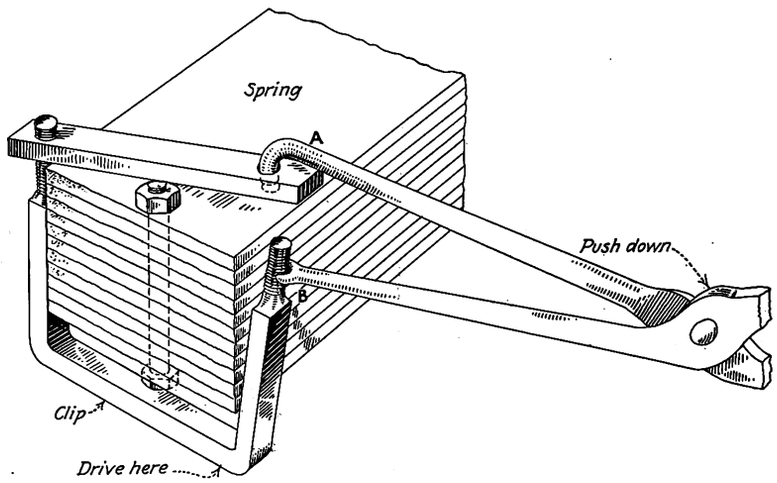
Electric Railway Journal Maintenance Data Sheet

BUSES AND TRUCKS—11

Clip Tongs Aid Bus Spring Installation*

By Farrell Tipton
Electrician San Diego Electric Railway, San Diego, Cal.

IT IS quite difficult to get both legs of the clip for holding laminated springs of buses into the holes of the draw plate, and when driving it over an automobile spring the leg of the clamp is often sprung. Installation of these clips has been made much easier in the shops of the San Diego Electric Railway, San Diego, Cal., by use of a pair of tongs with the handles remodelled to form a special tool for the work.



Special tool for installing bus spring clips

The tool is constructed by bending the end of one handle down and tapering this so as to fit readily into the hole of the draw plate. The other handle is cut off and drawn nearly to a chisel edge. A slot is cut on this edge so as to keep it from slipping off the bolt when applied. To bring the leg into position by means of the tool, the bent end *A* is placed in the hole of the draw plate as shown in the accompanying illustration, and the other end *B* is placed against the clip. By pushing down on the tongs and driving the clip in, the projecting end can be inserted.

*Submitted in Electric Railway Journal Prize Contest

Electric Railway Journal Maintenance Data Sheet

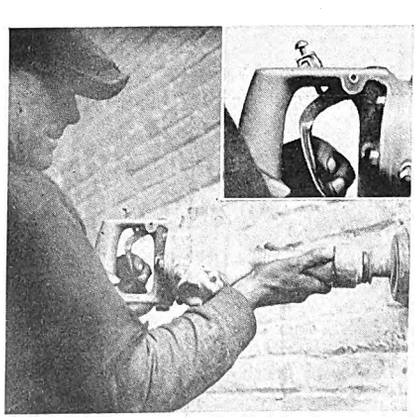
TRACK AND WAY DEPARTMENT—24

Valve Regulator for Pneumatically Operated Wire Brush*

By Frank J. Martin
Superintendent of Maintenance Pittsburgh Railways, Pittsburgh, Pa.

FOR the cleaning of steel work on bridges and other way structures with a pneumatically operated rotary wire brush the Pittsburgh Railways has added a minor attachment in the form of a valve regulator that eliminates a dangerous hazard when the operator is working on high scaffolding.

A ¼x3-in. stove bolt is mounted in the top of the handle of the pneumatic engine so that it limits the amount of air admitted by the trigger valve and can be set as desired. This enables the operator to maintain a strong grip on the handle and trigger of the machine so as to do efficient work with comparative safety. With the full air pressure it was found that the torque exerted by the rotary brush was sufficient to upset the operator if particular care was not exercised.



Setscrew in handle of pneumatic engine limits travel of trigger valve as desired

*Submitted in Electric Railway Journal Prize Contest

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Electric Railway Journal Maintenance Data Sheet

BUSES AND TRUCKS—12

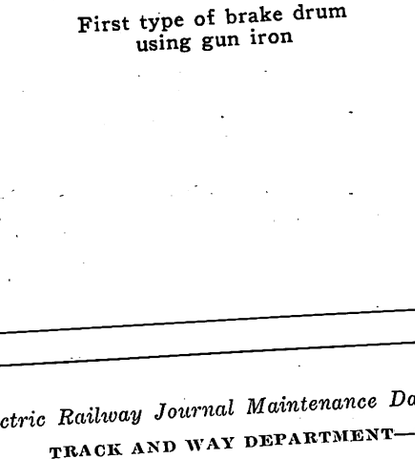
Gun Iron Used for Brake Drums*

By D. S. MacKay

Supervisor of Automotive Equipment
Boston Elevated Railway, Boston, Mass.

In the early part of 1923 the Boston Elevated Railway faced a problem of having to renew driveshaft brake drums two or three times a year. This was due to their scoring in service, which made it necessary also to replace the brake linings. The maximum service of the brake linings obtained was but 2,200 miles. This increased the maintenance cost for buses.

To overcome these troubles, driveshaft brake drums are now made of gun iron, which is obtained from a local manufacturer. This material develops a smooth and even finish on the braking surface of the drums without apparent signs of wear.



First type of brake drum using gun iron

Service from brake linings has been increased to approximately 16,000 miles and the life of the drums appears indefinite. This material is now used for all driveshaft drums and several rear wheel brake drums on the heavier type of buses and since its adoption brake drum renewals are practically unknown.

Correction of this trouble has improved brake conditions and resulted in a decided economy in labor and material with a corresponding marked reduction in maintenance cost. The accompanying illustration shows the first type of brake drum where gun iron was used.

*Submitted in Electric Railway Journal Prize Contest

Electric Railway Journal Maintenance Data Sheet

TRACK AND WAY DEPARTMENT—25

Strengthening Wheel Construction for Portable Equipment*

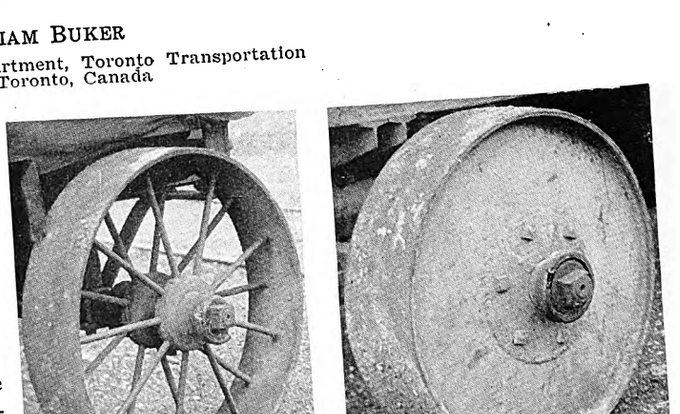
By William Buker

Master Mechanic, Way Department, Toronto Transportation Commission, Toronto, Canada

Several failures of steel wheels on portable air compressors have been experienced by the Toronto Transportation Commission due to running over hard surfaced city streets. These wheels are built with an iron hub into which are fastened cast-steel spokes, these in turn being welded into the steel tires as shown in the first illustration.

To overcome the trouble two worn-out bucket loader disks were dished. After cutting out the center hole to clear the hub flange these were welded to the tire on either side of the wheel, as shown in the accompanying illustration.

Other circles 10 in. in diameter with center hole cut to make a close fit on the hub proper were welded in two parts to both large disks, and the whole was pulled tight with six ¾-in. bolts.



Method of strengthening steel spoke cast-iron hub wheels on construction equipment

*Submitted in Electric Railway Journal Prize Contest

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Electric Railway Journal Maintenance Data Sheet

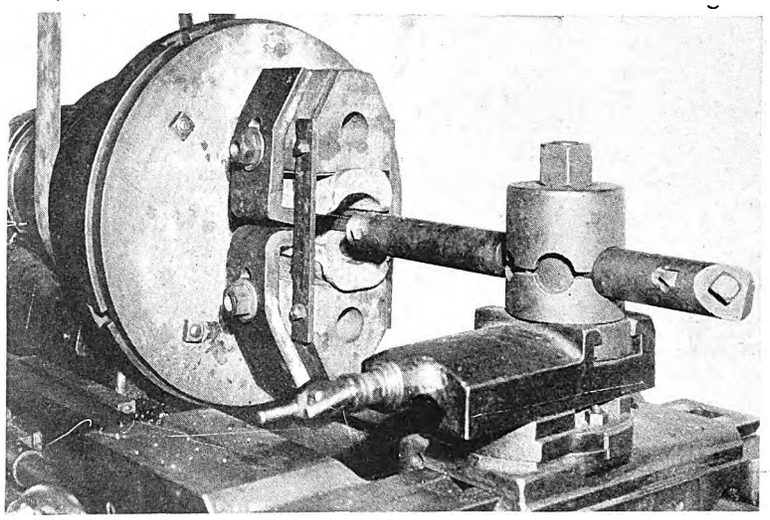
ROLLING STOCK—TRUCKS—22

Fixture for Boring Journal Bearings in a Lathe*

By Frank B. Carpenter
Master Mechanic Charleston Interurban Railroad, Charleston, W. Va.

LEAD-COPPER bronze is used for journal bearings by the Charleston Interurban Railroad, Charleston, W. Va. The mixture is known as Ex. B metal and consists of 78 per cent copper, 15 per cent lead and 7 per cent tin. Journal bearings are bored to necessary dimensions two at a time, in a lathe, by using the fixture shown in the accompanying illustration. The fixture is made of ordinary gray cast iron and has two projections into which the bearings fit for machining. The outside ends of these projections are braced by means of two bars bolted to the sides.

Four forged and machined jaw clamps are used to hold a pair of bearings in position for boring. These clamps are self-centering, and as the work is drawn down it is pulled to the center at the same time. The boring is done by attaching a boring bar to the tool post of the lathe. With this fixture three pairs, or six bearings, are machined per hour.



Boring two journal bearings in a special fixture

*Submitted in Electric Railway Journal Prize Contest

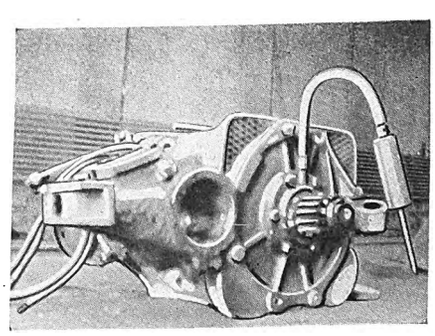
Electric Railway Journal Maintenance Data Sheet

ROLLING STOCK—ELECTRICAL—44

Grease Fittings for Lubrication of Ball Bearing Motors*

By R. T. Chiles
Master Mechanic Cumberland County Power & Light Company, Portland, Me.

WHEN the General Electric type 258-C motors went through the shops of the Cumberland County Power & Light Company for their first general overhauling it was found that the ball bearings with which these armatures were equipped were not receiving proper lubrication. To improve conditions, two grease pipes were applied to the motor, which consist of a ¼-in. pipe with nipple and cap. An Alemite grease compressor is used, which is equipped with a flexible connection and ¼-in Alemite fitting. When greasing, the pipe cap on the motor connection is removed and the ¼-in. pipe coupling attached to the Alemite compressor is screwed on. Armature bearings are now lubricated once each month with grease, a summer grade being used in the warm weather and a winter grade during cold weather. With this improved method of lubrication increased armature bearing mileage has resulted. For the year 1926, with 46 motors in active service, the average bearing mileage obtained was 121,851 miles.



Standard Alemite grease compressor used for lubricating armature bearings

*Submitted in Electric Railway Journal Prize Contest.

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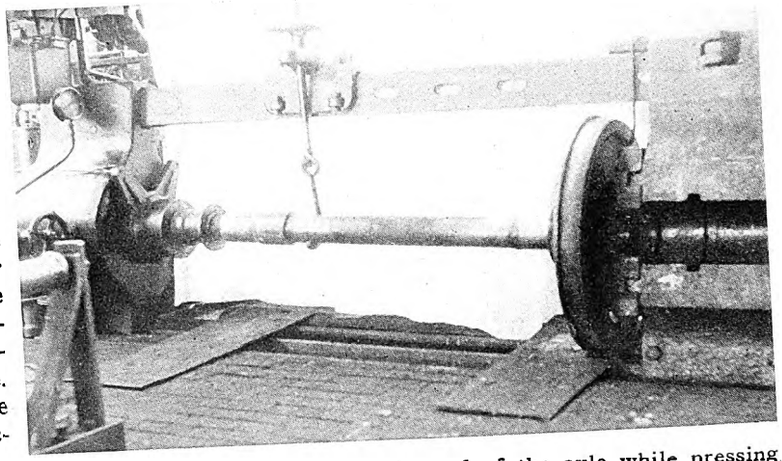
Electric Railway Journal Maintenance Data Sheet

ROLLING STOCK—TRUCKS—23

Split Sleeve Protects End of Shaft While Being Pressed into Wheel*

By C. B. Hall
Chief Clerk Mechanical Department Virginia Electric & Power Company, Norfolk, Va.

DANGER from bending axles at the journal bearing section while pressing on wheels has been overcome in the Norfolk shops of the Virginia Electric & Power Company by a split steel casting devised by T. W. Madison, master mechanic. The casting is constructed so as to fit over the journal end of the axle and apply pressure to the shoulder of the axle at the inside end of the bearing. The casting is so constructed that a ring keeps the casting in position while under pressure. Previous to the use of this device bent axle journals reached a menacing number.



A split steel casting placed on the end of the axle while pressing on wheels prevents bending

*Submitted in Electric Railway Journal Prize Contest

Electric Railway Journal Maintenance Data Sheet

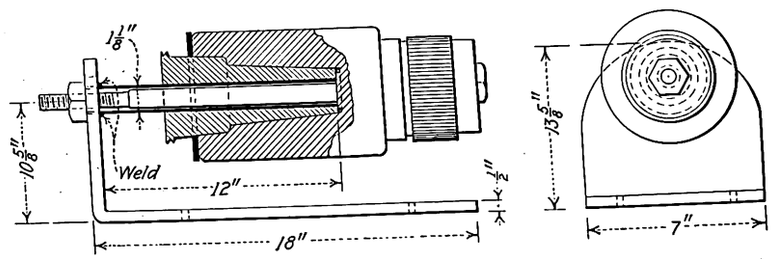
ROLLING STOCK ELECTRICAL—45

Air Compressor Armature Stand*

By Arthur E. Clegg
Foreman Electrical Department, San Diego Electric Railway, San Diego, Cal.

SOME types of compressor armatures have an extension of the shaft at the commutator end so short that it cannot be used for support. To support this type of armature while it is being repaired a stand was designed and made in the electrical department of the San Diego Electric Railway. The accompanying sketch shows the construction.

The supporting base is made from mild steel 7 in. wide by ½ in. thick. This is bent in the form of an "L" and the end is rounded off. The upright extension is 13⅝ in. high and the base is 18 in. long. The stand can be bolted to a table which has castors on the legs if it is desired to have this portable. For supporting the armature a pipe is arranged to slide over the armature shaft. With the type of armature used in San Diego a 1¼-in. inside diameter pipe 12 in. long is used. This is fitted to the end piece and welded.



Stand for air compressor armature used in the electrical department of the San Diego Electric Railway

*Submitted in Electric Railway Journal Prize Contest

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HEAT ALONE IS NOT SUFFICIENT FOR ARMATURE BAKING

It takes more than heat to properly bake an armature or a field coil for electric railway service.

The baking of the dipped coil or armature is probably the most important of the series of operations through which it passes. Under-baking will leave the varnish soft and liable to be thrown off by the centrifugal force of the rotating armature, leaving it unprotected and out of balance. The remaining solvent and thinner in underbaked portions also decrease the dielectric strength and are apt to promote deterioration in both fabric and insulation. Overbaked insulation represents an economic loss in heat consumed beyond that necessary to bring the process to its proper point. But more important still, it also tends to shorten the effective life of the varnish in service.

It is therefore very important in baking to maintain the proper oven temperature and to hold all parts of the oven at the same temperature, to get uniformity of bake throughout. The fumes and gases from the volatile oils driven off by heat must be removed immediately in order to maintain the most effective drying conditions in the oven. Oxygen in sufficient quantity must be available in order to properly oxidize the heavier oils in the varnish compound.

For large armatures with deep windings, the better practice is to begin the bake with a temperature of about 150° F. holding this for about one hour before the maximum temperature is reached. This preliminary low temperature bake allows a thorough volatilization of the lighter oils from the interior of the coils before the oxidization of the outer layers has proceeded far enough to trap them. This precaution is not necessary with the shallower windings.

The volatiles having been driven off, the oven is brought up to full baking temperature and oxidization of the heavier oils is carried on. Full baking temperatures range from 200° to 250° F., the duration of bake from 5 to 48 hours on large magnet and field coils.

To meet successfully the requirements above stated it is essential that baking time, temperature and air conditioning be constantly under close control. And the control of these factors can only be obtained in an oven that is properly constructed, properly heated and properly ventilated—in short an oven intelligently designed and built for a specific purpose.

In view of the recognized economy of trouble-free motors, it is just good business to use the procedure and equipment which will produce a strong, durable protection for the armature windings.

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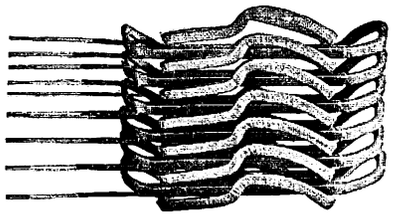

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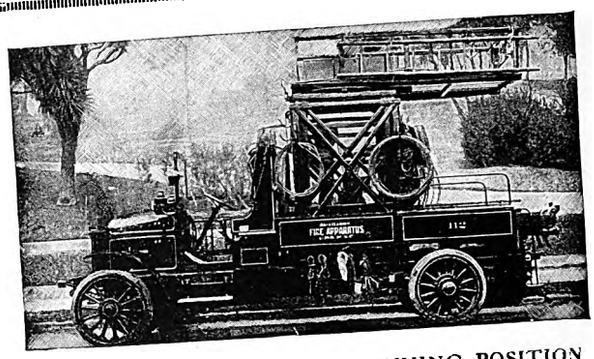

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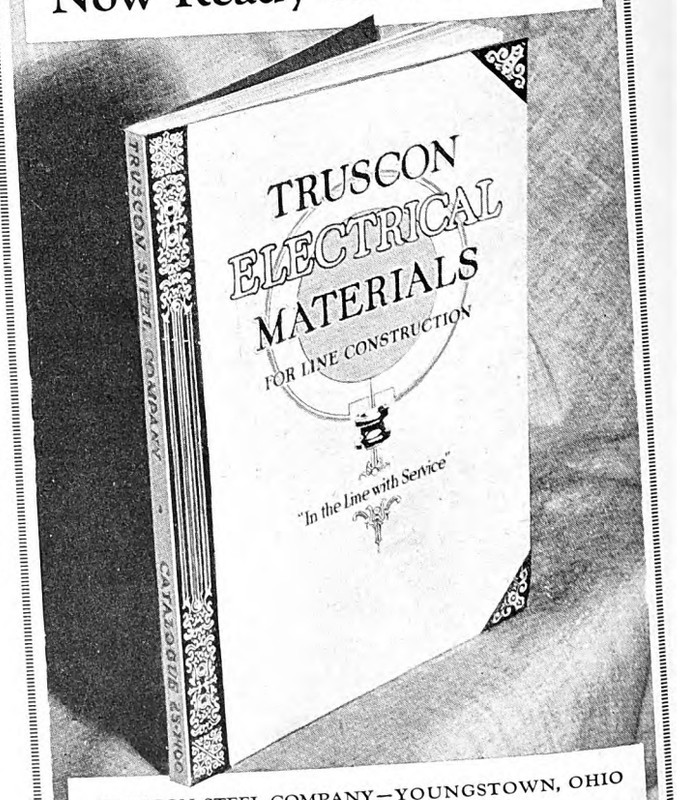

TRUSCON STEEL COMPANY—YOUNGSTOWN, OHIO

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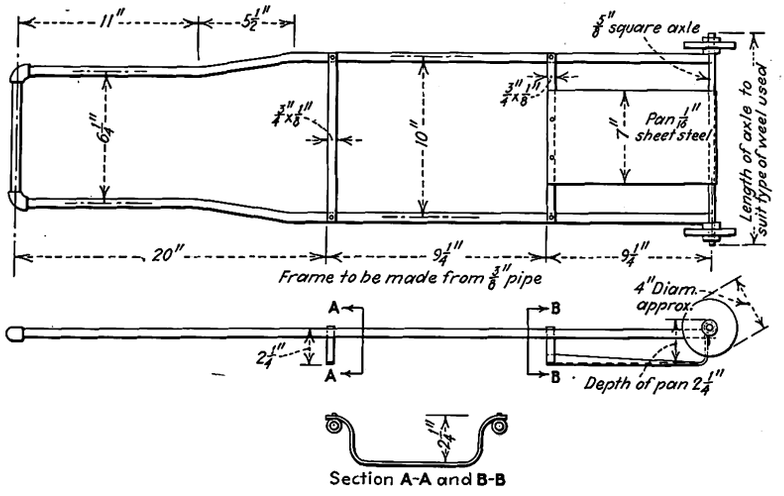
Electric Railway Journal Maintenance Data Sheet

ROLLING STOCK—MISCELLANEOUS—28

Truck for Handling Lift Jacks*

BY A. G. POLLARD
Rolling Stock Department Toronto Transportation Commission, Toronto, Canada

RECENTLY a small hand truck was designed for use in the Hillcrest shops and the car houses of the Toronto Transportation Commission, Toronto, Canada. This truck conveys lift jacks easily and quickly to those places in the shop where they are required.



Construction details of truck

Labor-saving truck for handling jacks

As may be seen in the accompanying illustration, the truck is simple and inexpensive, the framework being ordinary ⅜-in. black iron pipe. It is so light it can be pushed with one hand.

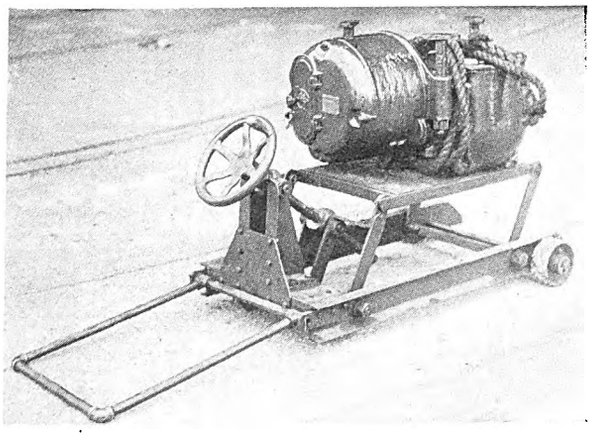
Submitted in ELECTRIC RAILWAY JOURNAL Prize Contest

Electric Railway Journal Maintenance Data Sheet

ROLLING STOCK—MISCELLANEOUS—30

Elevating Truck for Air Compressors*

BY PAUL UHLICH
Engineer Rolling Stock and Shop Department New Orleans Public Service, Inc., New Orleans, La.



Elevating truck for placing or removing air compressors

HANDLING air compressors efficiently prompted the design of a special truck which was built for the railway overhauling shop of the New Orleans Public Service, Inc. This truck is used for removing or replacing compressors under cars and has resulted in a great saving of labor. An overhead crane serves the aisles between car tracks so that the truck is used to transport compressors but a short distance.

The platform is raised and lowered by swinging on four links fastened to the framework. A screw fitted with a hand wheel at the top and with nuts to give the desired movement is used to raise and lower the platform. When fully lowered the platform is 6½ in. above ground, and when fully raised 17½ in. When raising or lowering it the operator stands on the pipe handle to steady the truck.

The side members of the truck are constructed of 4-in. channels. The front has an upright member for supporting the nut through which the screw turns. The links from the framework to the platform are 1¾×⅜-in. bar. Wheels are 6 in. diameter.

Submitted in ELECTRIC RAILWAY JOURNAL Prize Contest

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Electric Railway Journal Maintenance Data Sheet

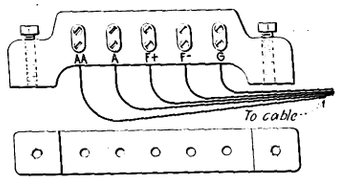
ROLLING STOCK—MISCELLANEOUS—29

Motor Lead Connection Block*

By Benjamin H. Hall

Shop Foreman West Penn Railways, McKeesport, Pa.

IN ORDER to overcome trouble in wet weather due to water splashing on motor lead connectors and causing short circuits, the West Penn Railways, McKeesport, Pa., now uses a motor lead connection block of the form illustrated. This is used to join the leads from the motors and the car body. Besides overcoming trouble from the short circuiting, it has proved a great time saver when removing a truck from underneath the car or replacing motor leads.



Motor lead connecting block

The connection block is made of ash and is fastened to the car sills by lagscrews. Connectors are soldered to the ends of the cable leads and are inserted in the block from the back. These connectors have two set screws, used to fasten the wire. A piece of No. 2 solid wire is soldered to the end of the motor lead that goes into the end of the connector. The block is stenciled and wires are tagged to correspond. By use of such a block, taping of connectors or covering with canvas is unnecessary.

*Submitted in Electric Railway Journal Prize Contest

Electric Railway Journal Maintenance Data Sheet

ROLLING STOCK—MISCELLANEOUS—31

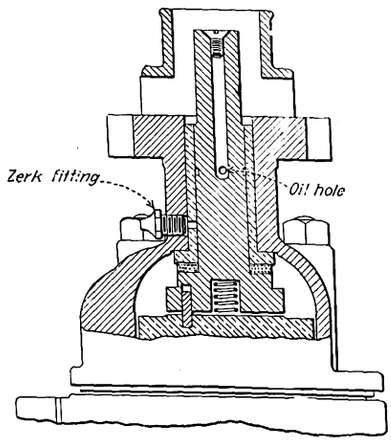
Grease Fitting Applied to Motorman's Brake Valve*

By Charlie Herms

General Foreman San Diego Electric Railway, San Diego, Cal.

ZERK fittings are being used successfully for lubricating M-24 air-brake valves on the San Diego Electric Railway. The fitting is installed by drilling a ⅛-in. hole through the valve body and bushing. The hole is then redrilled to size for tapping to take the thread of the grease fitting. This larger hole is drilled only through the body, leaving the ⅛-in. diameter in the bushing.

Experience has shown that the grease fitting should be as close to the key-seat washer as possible, and it always should be at least 2 in. below the top of the valve-stem bushing. This is necessary to prevent the grease from forcing out upward instead of going down and lubricating the key-seat washer. Failure to lubricate this joint is the cause of stiffness of the brake valve.



Method of applying Zerk fitting to air-brake valve

A good grade of alemite grease should be used. Common hard oil and graphite grease are unsatisfactory, as they have a tendency to lodge in the small valve ports, where they solidify and cause brake failures.

The grease inserted through the Zerk fittings remains in the valves longer than oil, and the difficulties due to clogging of oil holes are prevented. The grease also is forced past the key-seat washer and lubricates the rotary valve.

*Submitted in Electric Railway Journal Prize Contest.

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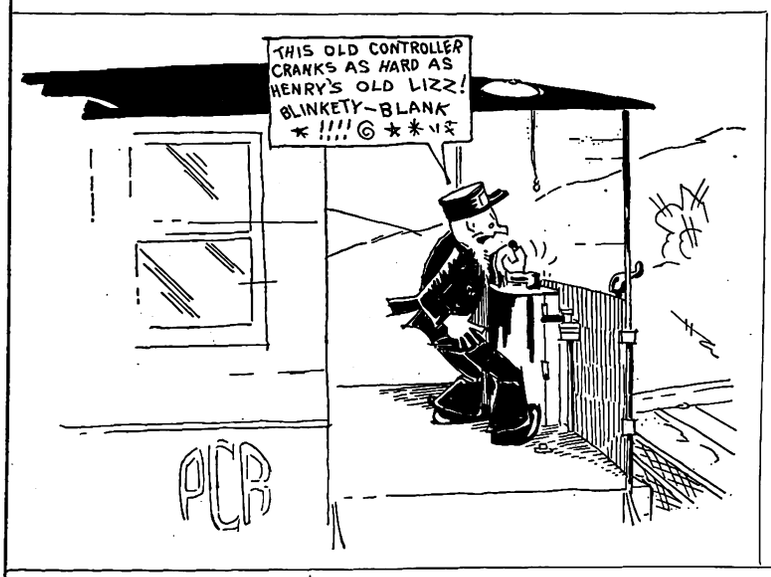
Adventures of

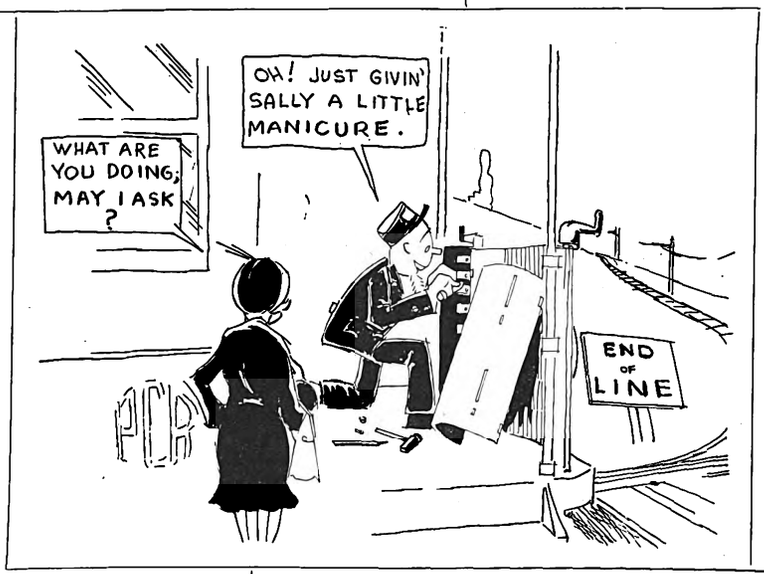
Old Man Trouble

on the

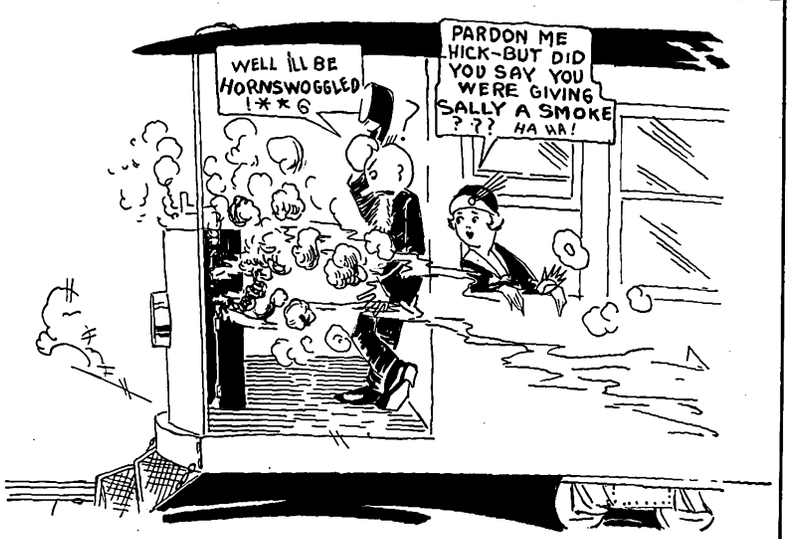
Hicksville Railway



You always get a skilled physician to set a dislocated finger, why not insist on a skilled electrician to set dislocated controller fingers?



It is costly to permit trainmen to tinker with controller fingers. Many controller failures can be traced to this source. Authorized, trained workmen can adjust the pressure to give maximum contact life with safe and easy operation.



ELECTRIC RAILWAY JOURNAL will be glad to furnish press proofs of this page for posting on bulletin boards and will supply electrotypes of this series at cost for use in company publications.

J. M. Zimmerman and E. L. Proctor, West. Elec. & Mfg. Co.

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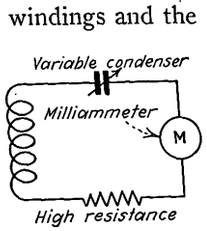
New Equipment Available

Radio Waves Search Out Insulation Faults

RADIO waves are now used to detect insulation faults in the coils of motors, generators, and other electrical machines by the Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa. In describing the new method, the company states that two insulation tests are necessary. First, to prove that a reasonable overload will not cause a short circuit between the windings and the frame of



Connections of receiving set

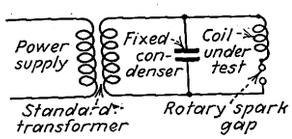


Diagram showing connection of coil under test

the machine, and second, to prove that a reasonable overload will not cause a short circuit between turns of the coil winding. The equipment used for the test is shown diagrammatically in the accompanying illustrations. Power is supplied by a standard transformer. By adjusting the length of the rotary spark gap, the point on the voltage curve at which a spark will occur is determined. This testing device is a simple type of radio transmitter.

A second diagram shows the connections for detecting faults in coils by means of a special radio receiving set having a sensitive milliammeter in the circuit. By adjusting the variable condenser the receiving set is tuned to the wave sent out by the transmitter. The milliammeter will then indicate the maximum reading. If with this setting a faulty coil is put into the circuit of the transmitter the wave length will be altered, so the receiving set will be out of tune and the milliammeter reading will drop. One of the chief merits claimed for the test is that it invariably shows the cause of the failure as the arc is of only such intensity as to burn out the weak insulation without burning the adjacent insulation or the copper.

Dick Prescott Attends a Meeting

And Gets an Ovation

WHEN Dick Prescott returned to the Consolidated Railway & Light Company's shop after having been told by General Manager Milburn of his appointment as superintendent of equipment, he proceeded with his own duties just as though nothing had happened.

Along toward the middle of the following forenoon, Tom Mullaney, retiring superintendent, sent for him. Dick responded promptly and was surprised to find all the foremen assembled and standing about Mullaney's office.

As Dick entered the room he was quickly aware that something unusual was transpiring. On Mullaney's desk, from which he had directed the destinies of the Consolidated shop for many years, was a large vase of flowers. Even Miss Stevens, Mr. Mullaney's secretary, was in the room, and it was apparent that she was responsible for the floral decorations. Everyone looked expectantly at Dick as he entered.

Tom Mullaney lost no time in getting things started. Motioning to Dick to stand beside him he addressed himself to the assembled foremen. "Gentlemen," said Mullaney with a broad smile, "I called you together to present to you your new superintendent of equipment."

A moment of silence followed this introduction, while the full import of what Mullaney had said spread through the group of foremen. Then a deafening burst of applause filled the little room. Dick was decidedly ill at ease and struggled valiantly to master the tension that welled up in his throat at this manifestation of popularity among the men upon whose co-operation his future success would depend.

"I am going to take it easy on my farm for awhile," continued Mullaney. He tried to say this in an offhand manner, but his own feelings at laying down the reins he had held so long were manifest in his face and his voice.

"Dick is the logical man for the job. All of you know that he has earned this promotion by initiative and hard work. I join with you and Mr. Milburn in wishing him success in this larger responsibility."

Again the room broke into applause.

"You men all know that I'm not a speechmaker," went on Mullaney as soon as he could make himself heard again. "However, I do want to say that there is a real inspiration for all of you in Dick's success. He came in here as a carpenter's assistant and he is becoming superintendent of the department after just a little more than four years. Some men are inclined to think that they need luck or 'pull' to get ahead. Dick didn't have either. But he did have a keen mind and he wasn't afraid to use it. When the company faced a problem he tried to find a way of solving it. He wasn't afraid of doing more work than he was paid for. He never claimed credit for the other fellow's ideas. He is interested in the success of the men that work with him. He's fair and he's honest in dealing with those below him in rank as well as those above him. He's got a backbone and he won't stand for any nonsense. I want to congratulate you as well as him and I'm proud to turn over to Mr. Prescott the position of superintendent of equipment."

As Mullaney finished this brief speech he turned and shook hands with Dick, pointed to his vacant chair and stepped around the table to stand with the foremen while another burst of applause—longer this time—filled the little office.

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Association Activities

U. S. Chamber of Commerce Program

"TEAMWORK for Prosperity" is the subject selected by the Chamber of Commerce of the United States for its sixteenth annual meeting to be held in Washington, D. C., May 7-11, 1928. What teamwork means to agriculture, civic development, domestic distribution, finance, foreign commerce, insurance, manufacture, natural resources, production and transportation and communication will be discussed by prominent men throughout the United States. The annual dinner will be held in the Washington Auditorium at 7 p.m., Thursday, May 10. Arrangements have been made for luncheon and dinner meetings, in addition to the general sessions.

According to the announcement of the meeting, the various opportunities for teamwork, nationally and locally, and the factors affecting such teamwork, with indication of successful methods that have been pursued, will be passed in review in this meeting of business men. The new competition, business traffic rules for the future, a broader outlook on business at home and abroad are projected in this comprehensive program.

Southwestern Program Announced

STREET traffic, buses and the development of car riding are the subjects for the railway section at the convention of the Southwestern Public Service Association to be held in Dallas, Tex., May 2-5, according to an announcement by Secretary E. N. Willis.

The program of the railway section follows:

WEDNESDAY, MAY 2, AT 2 P.M.

Subject: Traffic

"Progress in Relieving Traffic Congestion," by Charles Gordon, editor ELECTRIC RAILWAY JOURNAL, New York.

Discussion by D. C. O'Dowd, New Orleans Public Service, Inc., and others. This will include contributions by police traffic officers as well as railway men.

"Effect of New Equipment in Speeding up Traffic," by J. L. Alexander, Houston Electric Company, and G. I. Plummer, Dallas Railway & Terminal Company.

"Personnel—Selection and Training," by C. J. Crampton, Dallas Railway & Terminal Company, and others.

Discussion by J. L. Alexander, Houston Electric Company, and others.

THURSDAY, MAY 3, AT 2 P.M.

Subject: Buses

"Buses in Interurban Service."—Discussion, led by R. L. Miller, Texas Coaches, Inc., Ft. Worth.

"Buses in Urban Service."—Discussion, led by R. B. Allen, Houston Electric Company, and W. R. Castle, San Antonio Public Service Company.

"New Developments in Rail and Rubber Borne Vehicles," by L. E. Thorne, Northern Texas Traction Company, Fort Worth.

Discussion led by R. M. O'Brien, New Orleans Public Service, Inc., and F. B. Scurlock, El Paso Electric Company.

FRIDAY, MAY 4, AT 2 P.M.

"Rebuilding the Car Riding Habit," by W. W. Holden, manager traction department, San Antonio Public Service Company, and L. C. Singleton, Eastern Texas Electric Company, Beaumont.

Mathematical Symbols

MATHEMATICAL symbols have been approved as American standards, thus completing the first step in a program of unification of the scientific and engineering symbols and abbreviations used in engineering and industry under the auspices of the American Engineering Standards Committee. The confusion resulting from variations in symbols used in different publications, reports and tables, led to the initiation of a project of unification by the A.E.S.C. early in 1923. The work has been progressing since that time, with fourteen national organizations participating.

The approved mathematical symbols include those for arithmetic and algebra, elementary geometry, analytic geometry, trigonometric and hyperbolic functions, calculus, special functions, and vector analysis. The effort was made to select from symbols already in use those that are most clearly understood and least likely to lead to confusion with other symbols.

Prof. E. V. Huntington of Harvard University, representing the American Mathematical Society, was chairman of the mathematical symbols subcommittee. This sub-committee is part of the sectional committee on scientific and engineering symbols and abbreviations, of which Dr. J. Franklin Meyer of the Bureau of Standards is chairman. The sectional committee includes other subcommittees on symbols for hydraulics, for heat and thermodynamics, for aeronautics, navigation and topographical symbols, electrotechnical symbols (including radio), symbols for photometry and illumination, and for mechanics, structural engineering and testing materials.

New York Association to Meet at Coney Island

JUNE 14 and 15, the New York Electric Railway Association will hold a two-day summer meeting at the Half Moon Hotel, Coney Island, N. Y. Special arrangements will be made to give the delegates an opportunity to inspect recent improvements and developments in the traction field in and around New York City. The banquet will be held in the Half Moon Hotel Thursday evening, June 14. A complete program will be announced later.

COMING MEETINGS OF *Electric Railway and Allied Associations*

April 25-27—American Society of Civil Engineers, spring meeting, Washington Hotel, Washington, D. C.

April 25-27 — American Welding Society, annual meeting, 33 West 39th Street, New York, N. Y.

April 26-28—Missouri Association of Public Utilities, Jefferson City, Mo.

May 2-5 — Southwestern Public Service Association, Dallas, Texas.

May 4 — Metropolitan Section, A.E.R.A., 33 W. 39th Street, New York, N. Y.

May 6-12—Union Internationale de Tramways, de Chemins de fer d'Interet Local et de Transports Publics Automobiles, Rome, Italy.

May 8-11—United States Chamber of Commerce, Washington, D. C.

May 9—A.E.R.A. Executive Committee, Washington, D. C., 3 p.m.

May 9-10—Central Electric Railway Master Mechanics' Association, Lawrence Hotel, Erie, Pa.

May 24—New England Street Railway Club, annual meeting, Boston, Mass.

June 4-6—Midwest Electric Railway Association, Hotel Baltimore, Kansas City, Mo.

June 6-8—Canadian Electric Railway Association, annual convention and exhibits, Toronto, Canada.

June 14-15—New York Electric Railway Association, Half Moon Hotel, Coney Island, N. Y.

June 20-27 — American Railway Association, Div. 5—Mechanical, annual convention and exhibit, Atlantic City, N. J.

June 21-22 — American Railway Association, Motor Transport Division, Atlantic City, N. J.

June 21-22 — Wisconsin Utilities Association, Accounting Section, Hotel Pfister, Milwaukee, Wis.

June 28-29—Central Electric Railway Association, Cedar Point, Ohio.

July 8-12—Public Utilities Advertising Association and International Advertising Exposition, Detroit, Mich.

July 25-27—Electric Railway Association of Equipment Men, Southern Properties, Cincinnati, Ohio.

July 27-28—Central Electric Railway Accountants' Association, Detroit, Mich.

Aug. 16-17 — Wisconsin Utilities Association, Transportation Section, Sheboygan, Wis.

SEPT. 22-28, 1928

American Electric Railway Association, 47th annual convention and exhibit, Cleveland, Ohio.

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News of the Industry

No Transit Survey by Port Board

Governor Smith of New York disapproves bill to authorize Port Authority to consider suburban traffic problem

Governor Smith of New York on April 6 vetoed the bill which would have authorized the New York Port Authority to make a survey of the interstate suburban transit problem in the metropolitan areas with a view to enlarging the comprehensive port plan so as to include suburban traffic relief.

The Governor said that he was convinced that there was urgent need that something be done to improve suburban traffic conditions, but that he also believed the Port Authority should stick to its original program of improving freight distribution in the port.

Calling attention to the fact that he was once a member of the Port Authority, the Governor said it had been a source of pleasure to him to note the soundness of the financial principles back of that body, but that he had been disappointed because the opposition of the railroads had prevented it from making any real progress. The Governor said, in part, in his veto message:

> There can be no question as to the urgent need of working out a solution of the suburban passenger traffic problem in the metropolitan district. The present railroad stations and traffic facilities in New York City, so far as suburban transportation is concerned, are already hopelessly inadequate, and no hope for the future lies in the efforts to expand these facilities.
>
> On the other hand, I am satisfied that no solution can be found by merely dumping suburban passengers at the outlying parts of the city and forcing them into the already overcrowded city subway and elevated systems. Some solution must be found along the lines of an entirely new suburban subway system through which suburban trains can be operated connecting New Jersey, Westchester and Long Island with New York City and with each other.
>
> Various attempts to solve this problem have been made through special legislative commissions and through private agencies and organizations. The solution now proposed is that the Port of New York Authority finance these facilities through the issuance of bonds similar to the bonds issued to finance the various Hudson River and Staten Island bridges.
>
> No one can question my interest in and support of the Port of New York Authority. I was a member of this authority by appointment of Governor Miller between my first and second terms as Governor and represented the authority at Albany when the comprehensive plan for port development was adopted by our State Legislature. I have been and am vitally interested in carrying out this comprehensive plan.
>
> It has been a source of great satisfaction to me to see the soundness of the financial principles back of the Port Authority demonstrated in the building of the great bridges which are now under way. On the other hand, it has been a great disappointment to me to find that the opposition of the railroads has to date prevented the making of real progress in working out the program of freight distribution in the port which always has been the main object and purpose of the Port of New York Authority.
>
> I am satisfied that the Port Authority should stick to this program and I am entirely unwilling to give my approval to any measure which at the expense of the solution of the great freight distribution problem will set the Port Authority off on an entirely new line of endeavor connected with the solution of the suburban passenger problem.

Free Rides in Portland to Spring Window Displays

All cars and buses of the Portland Electric Power Company, Portland, Ore., were chartered by the Chamber of Commerce recently during the spring opening. Between the hours of 7 and 8 p.m., inbound carriers served the public free of charge, as indicated on posters placed in the cars and in the stores several days previous to the affair. Thousands took advantage of the free ride to go into the loop district to view the window displays showing new spring apparel.

Suburban Fares a Problem

Cleveland Council unwilling to have railway operate in Cleveland Heights unless fare pays cost of service—Survey shows 46 per cent of riders originate in suburbs

A BATTLE is going on to extend the service-at-cost provisions of the Tayler grant to the suburbs. The rate of fare for East Cleveland over the lines of the Cleveland Railway is before a board of arbitration since the East Cleveland franchise provides for revision every five years. In Cleveland Heights the matter has taken a different course. The suburb wants a new franchise providing for extensions. The Cleveland Council has refused to approve one franchise and has served notice on the Heights it will refuse to approve any franchise unless it provides a rate of fare that will pay the cost of the service.

In both suburbs the same rate of fare is proposed by Traction Commissioner C. M. Ballou, who represents the interests of the Cleveland car riders. This is a fare always three steps higher in the Tayler grant schedule of fares than the rate of fare which prevails in Cleveland. With the Cleveland fare 7 cents cash, 8 tickets for 50 cents, the suburbs would pay 10 cents cash, 6 tickets for 50 cents.

The arbitrators in the East Cleveland fare case are Ed Doty, Charles M. Buss and Charles Higley. The situation is complicated by the fact that a portion of Cleveland extends beyond East Cleveland, so that these Clevelanders presumably could ride farther than East Clevelanders and pay a lower fare.

In a brief submitted to the arbitrators the general problem was outlined as follows:

> Since March 1, 1910, the city of Cleveland and the Cleveland Railway have had a contract for railway service based on the service-at-cost principle, but not once in the entire period of 18 years have the city and the railway entered into a single contract with a suburban city on the same basis, though strangely enough this plan was contemplated essentially in the original Tayler grant, since the costs to be met by suburban fares were definitely specified. The city of Cleveland throughout this period has had a flexible or variable rate of fare, one that fluctuates with the cost of service. The suburbs on the contrary have had a fixed rate of fare and one that does not fluctuate with the cost of service. One wonders how two such diametrically opposed ideas on systems could live side by side for so long a period without more serious friction than has actually occurred. One wonders also why this principle has never found more favorable consideration for suburban service in face of the many claims made for it in the city of Cleveland.
>
> It is inescapable that if one part of a system has a fluctuating rate of fare which will absorb rising costs by an increase in the rate of fare and the balance of the system has no such provision, then the elastic part will assume the burden of the increased cost of the entire system and the fixed part none of the increased costs. So long as the central city is very large in comparison to a few insignificant suburbs, this arrangement can be tolerated. But can we continue to ignore the suburbs as insignificant in view of the facts already pointed out?
>
> Meanwhile the population of the suburbs has increased until a recent survey by Parsons, Klapp, Brinkerhoff & Douglas showed that on the lines tapping the major suburbs 46 per cent of the riders originate in the suburbs and 54 per cent in the city. Last year the loss from operations in the three suburbs totalled more than $1,000,000. Had this money been saved, Clevelanders would be riding for 6 cents today instead of paying 7 cents.
>
> The matter of suburban fares in Cleveland has claimed much attention from the daily newspapers and from community and other papers devoted to civic subjects.

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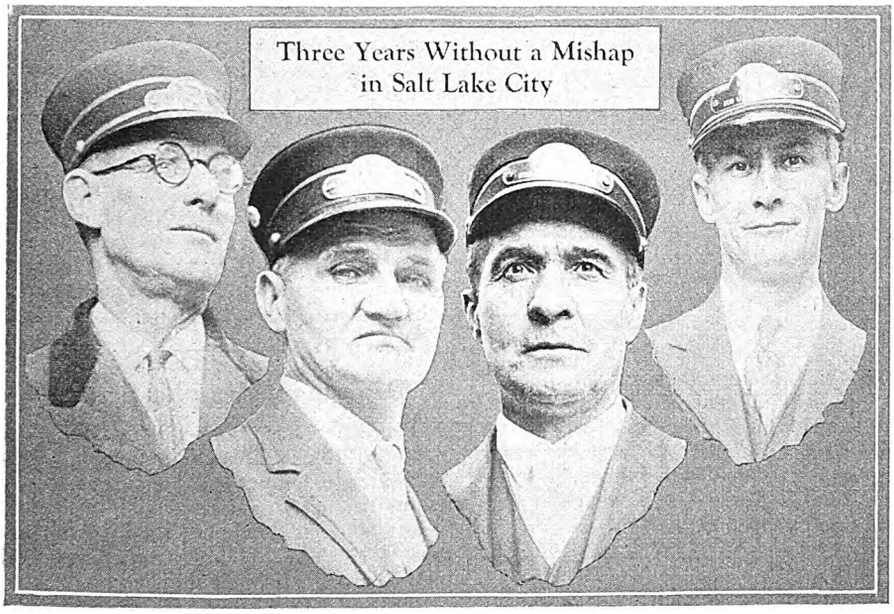
Record Men at Salt Lake City Honored

The winners of the January safety contest of the Utah Light & Traction Company, Salt Lake City, Utah, and the men having no accidents during the year just past were banquetted at the Newhouse Hotel, on the evening of Feb. 18, in honor of their successful participation in the yearly safety contest, as well as the monthly team contest.



Forty-one trainmen were successful in keeping a clear accident record for the year; four of these were operators having no accidents for a period of three years. The men holding this enviable record are John Winward, Dolph Evans, Lars Christensen and Byron Sperry. The one-year men are: C. O. Strong, Carl Peterson, Frank Pickering, William Shelton, Robert Moss, Joseph Lindsay, E. Johanson, Joseph DeBry, E. E. Crutchfield, Paul Eckman, D. B. Woodhead, Roy Goodman, H. Natter, Dan Parker, Jacob Hill, Allan Davis, Ike Roden, Charles Carlson, Vern Crawford, Fred Timmerman, Mark McDaniels, Herbert Cherrington, Bruce Tingley, W. A. Cobble, F. Groom, Karl Booth, C. McLeod, Leonard Woods, Henry Scheutter, William Schrader, J. E. Jeppson, William Summers, B. Thormstorff, E. L. Jenkins, Samuel Hazen, Robert Gee, and last, but not least, Elgin Johnson. Each of the three-year men was presented two $20 gold pieces, while the one-year men received one.

Cor Vreeken, White team captain, was the toastmaster.

Fare Raise on Pennsylvania Line Upheld

Complaints launched by the Delaware County communities against the 2-cent increase in fares on the lines of the Philadelphia & West Chester Traction Company, Upper Darby, Pa., were dismissed April 13 by the Public Service Commission. That body ruled that the higher rate was not unjust or unreasonable and refused the proposition of the complainants that the regular rider should be carried at a commutation rate of less than 10 cents per zone and that school children be carried at a special rate.

The company increased its cash fares from 8 cents to 10 cents on June 20, 1927 and discontinued the general sale of tickets. It was contended by the railway that since the general use of motor vehicles was reducing its revenues fares had to be raised or the standard of service lowered.

3,600 "Ads" Submitted in Public Utility Contest

A total of 158 of the leading public utility operating companies of the United States and Canada entered the better copy contest conducted by the Public Utilities Advertising Association. They submitted 3,600 advertisements for the judging. The contest, which closed April 1, included newspaper and periodical advertising released during the previous. Awards will be made for the three best ads in each of three divisions: electris, gas and transportation. The awards will be made jointly by the Public Utilities Advertising Association with the National Electric Light Association, American Gas Association and American Electric Railway Association in their respective divisions.

The ads will be judged by a board representing these four associations, and by a committee consisting of P. L. Thomson of the Western Electric, J. C. McQuiston of Westinghouse and T. J. McManis of General Electric. The awards will be made at the annual convention of the Public Utilities Advertsing Association in Detroit in conjunction with the International Advertising Association on July 10.

Refusal on Piedmont & Northern Extensions

Applications of the Piedmont & Northern Railway for permission to extend its lines of railroad from Spartanburg, S. C., to Gastonia, S. C., and from Charlotte, N. C., to Winston-Salem, N. C., have been denied by the Interstate Commerce Commission. The Piedmont & Northern construction proposals, the commission held, would result in the paralleling of existing railroads, chiefly the Southern Railway, and would not be necessary to the agricultural and business interests of the territory proposed to be traversed. It was declared by the commission that the presumption against such paralleling as was proposed could not be overcome by such evidence as was presented. That body added that the investment proposed would not be justified by the net addition to the railway revenues of the country. The order said in part:

> The competitive nature of the enterprise is aggravated by the association of the applicants with large interests which have the power to control or influence much traffic on other grounds than transportation service.
>
> There would be some advantage both to the applicants and to the communities served in joining the Piedmont and Northern to existing lines. Only a small part of the traffic handled on either is, or would be, destined to points on the other. They are being operated successfully and the evidence presented does not justify further paralleling the Southern closely for a distance of 53 miles. Upon the facts presented we find that the present and future public convenience and necessity are not shown to require the construction by the applicants of the line of railroad described.

Commissioners Esch, McManamy and Brainerd dissented from the majority and voted to grant the application. Commissioner McManamy in his dissenting opinion declared that the Southern and other railroads which objected to the Piedmont & Northern extension were among the most prosperous railroad lines of the country and not in danger from the threatened competition.

Paving an Issue in St. Paul

The matter of paving in St. Paul, Minn., has come to a head as a result of defeat early in March of a proposed charter amendment which would have relieved the St. Paul City Railway of paving obligations. As a matter of fact, half a dozen issues complicate the St. Paul situation. City officials are making efforts to prevent an increase in fare, particularly seeking to prevent the St. Paul fare from being made higher than the Minneapolis fare.

As recently as April 9 a program of paving between tracks in St. Paul was the subject of a conference between Council members and railway officials. Whether the city and the company can get together on work to be done this year by the company is likely to determine the city's policy as to future negotiations aimed at amicable settlement of the entire problem.

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Public Utility Investigation to Be Resumed April 24

Two thousand returns from public utility operating companies have been filed with the Federal Trade Commission as answers to the first general questionnaire sent out by the commission in connection with its investigation of public utilities. This was made known by the commission on April 16 in sending its second monthly report of progress to the Senate.

The returns contain data regarding electric energy and gas capacity, production, purchases, sales, interstate business, inter-company relationships, earning and investment.

Public hearings will be resumed on April 24 when officers and employees of the National Electric Light Association, American Gas Association and the Joint Committee of National Utilities Associations will testify.

A large number of exhibits has already been obtained from these organizations and will be introduced into the record at the hearings. Examination of the books and papers of still other public utilities and bureaus is in progress.

The interim report sent to the Senate on April 10 is the second such record transmitted to that body by the commission in accordance with the provisions of Senate resolution 83 referring the public utilities investigation to the commission and calling for public hearings and monthly reports of progress. Accompanying the report just made is a transcript of the recent three-day public hearings. A list of the large number of exhibits entered at these hearings and descriptions of each are being prepared for use of the Senate.

Propriety of Extensions Questioned in Cincinnati

Extreme caution must be used in extension of car or bus service at Cincinnati, Ohio. This is the gist of a report presented by E. Dow Gilman, Public Utility Director, to Col. Sherrill, City Manager. In his report, Mr. Gilman makes a preliminary survey of ten extensions of service which have been requested and calls attention to the fact that by the year 1930 the Cincinnati Street Railway will be compelled to make an annual expenditure of approximately $1,075,600 more than in 1926, 1927 or 1928, exclusive of any extension.

Closely connected with the financial consideration of the extensions is the fact that the city has been requiring expenditures for improvements in the existing system far beyond the earning capacity of the system, the report states. Attention also is called to the fact that the company has been permitted to borrow $1,150,000 and that this borrowing does not solve a financial problem but merely defers it. If the loan is not paid back in five or six years it may become a capital charge. In concluding his report Mr. Gilman says:

In order to balance the estimate of increased expenditures in the coming years, it will be necessary either to increase the fares or to increase business or decrease operating costs or to permit a certain amount of capitalization of operating costs. We are hoping that there will be an increase in business. We are sure that there will be a considerable decrease in operation costs as a result of the better condition of the property. An annual increase in the operating expenses of more than $1,000,000 a year must receive careful consideration before adding further to such expenses.

Survey of Omaha Suggested

The real estate board of Omaha, Neb., has asked the City Council and city planning commission to employ traffic engineers for the purpose of making a complete survey of electric railway and bus service in their relation to the parking problems. It points out that the present street car system was laid out 30 years ago when the city was less than half its present size, and very few reroutings have been made since then and practically no extensions for a number of years. The communication sets out that the present management of the Omaha & Council Bluffs Street Railway has indicated a willingness to meet the public demand for rerouting of lines, if necessary, and to take care of needed bus and car line extensions.

Rehearing Sought by Los Angeles Railway

A petition was filed by the Los Angeles Railway, Los Angeles, Cal., with the Railroad Commission on April 14 seeking a rehearing in its application for an increase in fares. The company claims that continuation of the 5-cent fare as ordered by the commission is a confiscation of the company's property and would result in poorer service. Application for a 7-cent rate was denied by the commission last month, and another application for a 6-cent rate was denied in June of last year. Officials of the company claim that it is impossible to make savings in operating methods as recommended by the commission in its denial of the application.

Soliciting the people's ideas on color

Freight Service to Improve Texas Earnings

An amendment to the charter of the Texas Electric Railway, which operates interurban lines between Dallas and Waco, 100 miles; between Dallas and Denison, 110 miles; and between Dallas and Corsicana, 60 miles, has been filed in the secretary of state's office providing for the establishment of freight service upon all of these roads. This action automatically placed the system under the jurisdiction of the Texas Railroad Commission. According to James P. Griffin, vice-president in charge of operation, it is planned to start fast freight service over the three lines as soon as schedules can be worked out.

Dispute in Memphis Settled

The differences between the Memphis Street Railway, Memphis, Tenn., and its trainmen have been adjusted satisfactorily. A new contract for three years subject to cancellation by either side at the end of any twelve months' period has been agreed upon. The wage scale in effect for the past two years is to be continued for one year. If the contract is continued beyond one year, the wage scale may be opened upon demand of either party, and if a satisfactory agreement cannot be reached arbitration may be resorted to.

The controversy now settled arose over a demand of the trainmen for arbitration of disagreements arising in connection with suspension and discharge of employees in the administration of discipline. The company declined to accede to this demand. The city intervened through the Mayor and a final appeal committee was agreed to consisting of two members of the board of directors of the street railway and one outside member, all named by the Mayor. Only recently a board of arbitration recommended that the old wage scale should be continued in effect.

Improvements and Changes on New York State Lines

Several important changes were put into effect by the New York State Railways on April 15. They were: Adoption of a high speed schedule for the city-owned subway railroad in the bed of the abandoned Erie Canal; diversion of Rochester & Syracuse Interurban cars into the subway within the city limits, and rerouting of Arnott-Clifford surface cars through Main Street.

The new city subway schedule calls for ten-minute service during the rush hours (between 6:30 and 9 a.m. and

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4:30 and 7 p.m.) and fifteen-minute headway during the rest of the day up to 6:30 p.m. when twenty-minute service will be maintained until midnight.

The terminals of the subway are the Driving Park loop at the northwestern edge of the city and Winton Road at the northeastern rim, the subway bisecting the heart of the business district. Feeder power lines have been installed to take care of the additional subway service.

The diversion of the Rochester & Syracuse cars to the subway shortens the running time between Rochester and Syracuse by ten minutes. Three interurban railroads entering Rochester now are using the subway: The Rochester & Syracuse, the Rochester & Eastern and the Rochester, Lockport & Buffalo.

President Hamilton said that the placing of the interurban cars in the subway would relieve the congestion on Main Street so that the rerouting was possible.

Macon's Utility in the News

A newspaper section covering 14 pages is given over to the history of the Macon Railway & Light Company in the Macon *News*, of Thursday afternoon, April 5, 1928. Although the story begins with the year 1902 when a consolidation put six companies under one and the present name, incidents in the chartering of Macon's first railway in 1868 are related. There are portraits of the officials, together with pictures of the morning shift, afternoon shift, construction crew, cars and routes. In addition, some well-poised advertisements for the Macon service are included. Editorial comment called attention to the improvements projected by the company and to the expected public appreciation.

New Line to Ford's River Rouge Plant

Arrangements have been approved by the Detroit Street Railway Commission for the construction by the Department of Street Railways of a new double-track extension from the city's Michigan Avenue line to the River Rouge plant of the Ford Motor Company at a cost estimated at $85,000. Del A. Smith, general manager, says the extension will eliminate the present Ford-McGraw bus line and will result in an annual saving of $22,000.

The money for constructing the new line will come from the sinking fund of $3,705,000 required to make payments on the $7,580,000 D.U.R. purchase debt due in 1931. Both G. Ogden Ellis, president of the Street Railway Commission, and Mr. Smith have approved this plan of financing as has also the department's counsel.

The general manager pointed out the economies that result from investing the sinking fund in profit producing properties rather than letting it remain in the bank at a low rate of interest.

Negotiations Reopened

With primary out of way matter of settlement of railway situation is again before Chicago Council

Members of the local transportation committee of the Chicago City Council have re-opened the local railway negotiations. They were abandoned before the April 10 primary for "political reasons." The new efforts, however, are expected to be on a much more modest scale than in the past because of the opposition indicated at the polls to Mayor Thompson and Governor Small, who are in agreement on the nature and method of obtaining the proposed railway legislation.

It is understood that the transportation committee will now confine its activity to obtaining passage of only two of the five bills recently drafted—one, creating a local transit commission; the other, amending the cities and villages act to permit term franchises longer than the present twenty-year limitation. Whether or not Governor Small, in the light of his defeat for renomination, will abide by his decision to summon a special session of the Legislature next month to enact legislation to help settle Chicago's railway problem, is a matter of speculation among the Aldermen. Many believe that the proposed session was merely a campaign promise. Representatives of the railways have refused to comment on the franchise negotiations or legislative bills, but they are reputed to be at work on a new plan for a settlement.

When the local transportation committee discontinued discussion on the bills early in March, five proposed legislative measures were before them, one for home rule, one creating the terminable permit, another authorizing the construction of subways by special assessment, a fourth permitting the consolidation of the local railway systems and one amending the cities and villages act to remove the twenty-year limit on franchises.

Three of these bills had been recommended for passage to the full transportation committee by a sub-committee. These were the measures dealing with home rule, subway construction, and consolidation of systems. The bills on terminable permits and on amending the cities and villages act are still being considered by the subcommittee.

Baltimore Fare Suits Set for Hearing

Judge Joseph N. Ulman, in the Circuit Court, Baltimore, Md., has signed an order setting April 30 as the date to open all the cases involving the street car fare in Baltimore. The cases will be tried on the same record. All the suits are against the Maryland Public Service Commission, which recently authorized the United Railways & Electric Company to charge a fare of 9 cents straight or three tokens for 25 cents.

The Maryland Public Service Commission has answered in the Circuit Court, Baltimore, Md., the bills of complaint of the People's Corporation and the Socialist party of Maryland. Both these bills seek to restrain the commission from enforcing or continuing its order under which the United Railways & Electric Company, Baltimore, was permitted to charge an 8⅓-cent fare. Recently the commission answered a bill filed by the United through which the latter seeks to restrain the commission from interfering with a straight 10-cent fare.

Does Municipal Ownership Loom at Youngstown?

Henry Engle, street railway commissioner at Youngstown, Ohio, says the city may be forced, as a matter of self protection, to take over the local railway and bus lines due to the movements now under way to expand the city. Railway extension, north, south and west, may be necessary as a result of expansion in those directions and in the event the Municipal Railway can not agree to make those extensions the city may be forced to provide for its own transportation development.

More Jacksonville Franchises Drawn

The Council of Jacksonville, Fla., has received drafts of two proposed ordinances from Peter O. Knight, Tampa, counsel for the Stone and Webster interests in Florida, for comparison with the proposed franchise drawn by the Jacksonville citizens' committee to be granted to the Jacksonville Traction Company. It is expected that Mr. Knight or some official of the local railway will explain the two drafts to the Council and that all three drafts will be referred to a special committee to compile a franchise for the company that will prove satisfactory to the city and company alike.

Bright Cars for Summer in Norfolk

On the theory that summer equipment should have a summer appearance to attract riders, officials of the Norfolk division of the Virginia Electric & Power Company have announced that they had decided to repaint open cars used in handling resort traffic in bright colors, resembling awnings and porches. The tops of the cars will have orange and blue 18-in. strips, with the upper body and supports in cream color and the lower body in bright green.

Rehearing on Peoria Opposition

Peoria, Ill., has been granted a rehearing in the matter of its opposition to the proposed fare increase sought by the Illinois Power & Light Corporation from the Illinois Commerce Commission. Effective on March 1 the railway abolished the permit card and seven tokens for 50 cents system for a three for 25 cent system and a straight 10-cent cash fare.

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Counsel for Brooklyn Companies Deplored Attack on Commission

Clarence J. Shearn, special counsel for the Brooklyn City Railroad and the Brooklyn-Manhattan Transit Corporation in the bus hearings, said on April 17 that "there is no basis whatever for any reflection upon the Transit Commission, political or otherwise." He did this in reply to the charges made by William Bullock, director of the city affairs committee of the New York County Republican Committee.

Mr. Shearn explained that his clients were opposing the application of the Equitable Coach Company, which was attacked in the Republican statement, because the proposed bus system would cripple the surface lines. He said:

In recent statements issued for publication by the city affairs bureau of the Republican County Committee dealing with the Equitable Coach Company the Transit Commission, before which proceedings are now pending, is characterized as "a Tammany Commission" and severely criticized for its conduct of the case. My clients, the Brooklyn surface railroads, strongly deprecate any attempt to turn a judicial hearing into a political controversy.

Believing that the injection of 60 miles or more of competitive bus routes parallel with established surface lines would have a crippling effect upon the companies that must be depended upon to carry 500,000,000 passengers annually, the case of the surface lines is, naturally, being tried thoroughly and vigorously. The Brooklyn companies rely upon the merits of their case for success and consider it unfair and unfortunate that a political attack upon the tribunal charged with responsibility for deciding the case should be made in the newspapers.

While we have urged before the commission that the financial ability of the Equitable Coach Company should be established in the first instance, and thus perhaps save the expense of a long drawn-out contest, we have bowed with entire respect to the decision to postpone this issue until the various routes have been passed upon.

On behalf of the Brooklyn surface companies I wish to state that we feel that Commissioner Godley has conducted these hearings with marked ability, with complete fairness and with great patience, and there is no basis whatever for any reflection upon the Transit Commission, political or otherwise.

North Shore Goes After Business

The third annual better business campaign of the Chicago, North Shore & Milwaukee Railroad, Highwood, Ill., has been launched. In the January and February drives five different departments scored 100 per cent of their quota and a total of 5,247 new business tips was submitted. In addition to the $300 in regular quarterly prizes four special awards totaling $100 will be made during the first-quarter for the largest number of tips resulting in sales of 25-ride commutation tickets.

Records for the 1927 campaign activity show that 48 per cent of the North Shore Line personnel took part in the organized drive for new business. Tips on sources of additional business turned into the traffic department by employees during the year totaled 16,654. It is estimated that 36 per cent of these tips were converted into additional business to the railroad.

Abandonment Petition of Pacific Electric Withdrawn

Following an agreement reached by officials of the railway and the city of Redlands, Cal., the application of the Pacific Electric Railway to abandon the Smiley Heights car line was withdrawn on March 29, when the hearing opened before the Railroad Commission. The agreement provided that the Pacific Electric continue to operate the line, and keep it in good shape and operate cars on a schedule as reliable as that now in use. Certain paving requirements were mentioned in the pact. The city of Redlands opposed abandonment.

Skip-Stop Voted in Omaha

A straw ballot on abolishing the skip-stop in Omaha, Neb., taken at the recent primary election resulted in 14,184 negatives and 8,083 affirmatives. Only one line reported a majority in favor of abolition on the Omaha & Council Bluffs Street Railway. Manager Porter devised the ballot for the purpose of finding out if the demand evidenced by complaints was a universal one. He told the patrons that the abolition would cost the company from $30,000 to $40,000 a year and distributed cards showing the delay to traffic under the proposed plan.

Extension Appeal in O'Fallon Case

Federal District Judge Harris, at St. Louis, has granted the St. Louis & O'Fallon Railroad a time extension to May 9 for the docketing of the valuation appeal in U. S. Supreme Court. Postponement of the docketing means the case will not be argued this term, since arguments usually close late in April. It is expected a motion will be made to advance the case for hearing early in the next term, which opens on Oct. 1.

"You Must Share This Responsibility"

THERE comes a time when community progress stops. Its most common enemy is lack of civic interest—lack of honest consideration for the agencies that make a community happy, prosperous and progressive.

Had the public banded together to block all street paving projects Wichita could not have reached its present size.

Had the majority been opposed to the bond issues that made possible our beautiful new schools and University, Wichita would not rank as an educational center.

Had you fought the hundreds of improvements that together have made Wichita a city of over a hundred thousand population, your investments, your real estate and your business would be worth only a fraction of today's value.

Yet the one agency that *must* grow even faster than the community is held in check—*Transportation.* If Wichita fails to maintain its present rate of growth it will be because of lack of transportation facilities. The arms of the bus and street car lines must penetrate the outlying districts before a community can be built.

Lack of an adequate transportation fare must necessarily curtail maintenance and extension. Without an adequate fare the entire growth of Wichita will be undermined. It is your responsibility to see that Wichita transportation lines are maintained and extended. It is your responsibility to see that the transportation company is granted a rate sufficient to maintain and surpass its present service.

This is a serious matter and deserves your careful consideration. Without an increased rate transportation will suffer—without transportation the growth of Wichita will suffer.

Think it over—*Wichita, Kan., "Eagle."*

Utility Story Told Effectively

The Penn-Ohio System, Youngstown, Ohio, has reproduced in booklet form, principally for the further information of Penn-Ohio investors, the series of advertisements which appeared in the New York *Times Annalist* during the early months of 1928.

Their purpose was to acquaint business men with the facts about the remarkable growth which the Penn-Ohio System has enjoyed, and also to state to the public the principles and ideals which underlie the Penn-Ohio policies and managment.

The ads. referred to previously in ELECTRIC RAILWAY JOURNAL, provoked much favorable comment both from the standpoint of their content and the manner of their presentation. "The Penn-Ohio System—Its Place in the Community" deserves a place in the portfolio of all executives interested in the subject of better public relations.

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Recent Bus Developments

Georgia Commission Restrained Until Court of Appeals Ruling

A permanent injunction restraining the Georgia Public Service Commission from exercising jurisdiction over the bus lines in the state has just been denied by Judge John D. Humphries, of the Fulton Superior Court. However, Judge Humphries issued a supersedeas order keeping the temporary injunction in effect until the State Court of Appeals can construe the law.

Attorney Paul Lindsey, representing the bus line operators, contended that the Public Service Commission had no jurisdiction over buses, since they were not common carriers. Attorney S. J. Smith, Jr., representing the Public Service Commission before the court, held that buses were common carriers and as such amenable to the rules and regulations of the State Public Service Commission. Judge Humphries held that the buses were common carriers, and denied the petitioners a permanent restraining injunction.

Reading Wins Franchise Over P.R.T. Objection

The Reading Transportation Company, a subsidiary of the Reading Company, was granted the right to operate buses between Jenkintown and New Hope by the Public Service Commission on April 12 over the protest of the Philadelphia Rapid Transit Company, Philadelphia, Pa. The commission upheld the application on the ground that the bus service was intended to supplement rail service between those two points. The Philadelphia Rapid Transit Company operates electric lines through part of the territory which the Reading buses will serve.

The Reading buses will stop at 24 intermediate stations between Jenkintown and New Hope, but will not pick up incidental traffic along the road.

Permits Sought for Extensions in St. Louis

An application has been made by the St. Louis Public Service Company, St. Louis, Mo., to the Board of Public Service for a permit to operate a bus line from Grand Boulevard and Meramec Street southward along Grand-Kings Highway to Carondelet Park, a distance of 1.75 miles. It is planned to use three single-deck, pneumatic tired buses on this route. This bus line would be considered as part of the railway service. The fare would be the same as on the street cars, 8 cents or two tokens for 15 cents and transfers would be issued to and from the cars without extra fare.

The company has also sought authority to install a bus line on Kings Highway between Oakland and Southwest Avenues to connect the Southampton with the Manchester, Market and Taylor Avenue lines and through those street cars with other lines in Central and North St. Louis. The fare on this line would also be the same as on the street cars with transfer privileges. On this line three single-deck, pneumatic-tired buses would be used.

Insulls Participate in Deal for Chicago Terminal

Control of the Chicago Consolidated Bus Terminal Building Corporation has been acquired by the Insull, Motor Transit and Yelloway interests, the three largest interstate operators entering the city. Plans are practically completed to start operation of the modern terminal at Wabash Avenue and Roosevelt Road which has lain idle up to the present time.

The terminal will be used jointly by the Motor Transit Corporation, with its Greyhound, Royal, Rapid, Oriole, Mohawk, and other subsidiaries: The Shore Line Motor Coach Company, Metropolitan Motor Coach Company, Western Motor Coach Company, and by Yelloway, Inc. For the present these lines will retain existing terminals merely as stops to pick up passengers.

New Service in Marinette-Menominee

Electric railway cars in Marinette, Wis., and Menominee, Mich., were replaced by buses on March 24. Eight buses have been placed in service, four being licensed in Wisconsin and four in Michigan. These eight Reo buses are the latest in 21-passenger city coach transportation equipment. Street car tokens are being redeemed in exchange for bus tokens.

The fare for children on the new bus lines, and in fact for all transportation systems operated by the Wisconsin Public Service Corporation, is determined by height rather than by age. Marks on bus doors indicate the height of children. Those under 40 in. are carried free if accompanied by a person paying fare. Children more than 40 in. and less than 52 in. pay half fare and those over 52 in. full fare, except where special rates for school children are in effect.

The substitution of bus service for railway lines in the Twin Cities loomed as long ago as early in 1927 when J. P. Pulliam, vice-president and general manager of the Wisconsin Public Service Company, stated that railway service in Marinette and Menominee had been supplied at a loss of $80,000 in 1926.

Minnesota Vehicle Law Upheld

The Minnesota Supreme Court on April 13 upheld the state vehicle regulation law of 1925 under which the Railroad & Warehouse Commission licenses bus lines operating between fixed terminals. It affirmed the denial by Judge B. F. Wright of Itasca district court of the plea of Andrew J. LeFebvre to set aside the order by the commission denying him permission to operate buses for 38 miles between Grand Rapids and Hibbing. He had been granted a license to operate until a federal mail contract expired on July 1, 1927. The complainant charged that the act was discriminatory and the state had gone beyond its authority.

The higher court ruled that the state had control of its highways and might prohibit intrastate common carriers by motor vehicles from doing business unless licensed by the commission. Even though it excludes taxicabs, hotel and school buses and vehicles transporting farm products from regulation, the act is held not to be discriminatory.

Repair Work Expedited by Running Buses at Night

The Washington Railway & Electric Company, Washington, D. C., has obtained permission from the Public Utilities Commission of the District of Columbia to conduct with buses an owl service on three of its rail lines. This plan of service, which is scheduled to go into operation on May 1, will result in saving $18,000 a year, according to the estimates of officials. The three lines affected are: Lincoln Park-Georgetown; Ninth Street-Brightwood, and the Columbia line.

Although these lines constitute some of the longest hauls on the company's system, it is expected that fifteen buses, each making eight trips per night, will be sufficient to give the service. Officials point out that this bus operation will greatly facilitate track repair work, the major part of which is done during the night hours in order to interfere as little as possible with car schedules. Because of the prevalence of the conduit trolley system in Washington it is practically impossible to run temporary lines around repair work and considerable difficulty is therefore experienced in handling owl cars when the repair crews are at work.

Bus Service Sought on Berkeley Line

An application has been made by the Key System Transit Company, Oakland, Cal., to the California Railroad Commission for permission to abandon its present railway service from the intersection of San Pablo and Ashby Avenues, to the Hotel Claremont, in the city of Berkeley. A certificate of public convenience and necessity is sought to operate bus service over the route now traversed by the railway.

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Necessity for Regulation Shown

Conclusion to this effect seems inescapable from trend of testimony presented before the Senate Committee on Interstate Commerce which is considering the Parker Bill for regulation

CHANGES in the Parker bill to regulate interstate buses that will lead toward greater centralization of authority and consequently away from home rule by the state regulatory board seem likely as a result of the recent hearings before the House committee on interstate commerce, but nothing conclusive can be stated because all presumptions necessarily are based on things that are intangible.

As indicated in the ELECTRIC RAILWAY JOURNAL for April 13, S. A. Markel, chairman of the Legislative Committee, Bus Division, A.A.A., outlined the case for the bill. He introduced a group of ten amendments, mostly to clarify the wording.

At the hearing on the second day Samuel I. Lipp, representing the Cincinnati, Lawrenceburg & Aurora Electric Street Railroad, favored early passage of the bill as drawn with a change of definition for motor carriers to include all bus operators in interstate service of any kind and omission of the grandfather clause.

Frank R. Fageol expressed his conviction that the interstate bus business should be regulated. He suggested, however, that the grandfather clause might well be modified so as to permit carriers to prove the convenience and necessity of their operation on the basis of their revence per mile or the riding factor. He emphasized his belief that it was not the function of the manufacturer to concern himself with the formulation of the terms of the statute under which the operators of his product would be regulated.

The third day was opened by Judge C. C. McChord, former chairman of the Interstate Commerce Commission, reading a statement outlining the position of the National Automobile Chamber of Commerce. He said that at the present time a provision for issuing a certificate of convenience and necessity is enough, that insurance is necessary but that the states now have power to compel its carriage, that the machinery provided by the bill is hopelessly complicated and grave doubt exists that it is constitutional, and last that, because of the diversity of conditions, the matter should be considered carefully.

Following Judge McChord, La Rue Brown took up the case specifically for the N.A.C.C. He said the Chamber accepted a statement of the motor carriers themselves that regulation was needed and consequently favored regulation of the kind proposed. A radical extension of regulation by the federal government was being proposed and he entertained grave doubts about it being constitutional. In this connection Mr. Brown quoted Chief Justice Fuller to the effect that delegation of federel power to local governmental units is unconstitutional.

Mr. Brown continued with the assertion that while the N.A.C.C. believed regulation is needed, it should rest lightly on the operating industry. Probably this could best be done with a federal commission, which could be either the I.C.C., a part of it or a separate board. This plan would be complex but not nearly as much so as the procedure outlined in the Parker bill. If regulation were put into effect it would be enough to have certification only, with revokation of the certificate as a disciplinary measure. He felt that all carriers operating one year should be granted certificates as a matter of right. In conclusion, he said that the N.A.C.C. favors regulation, but wants the committee to remember that the motor carrier industry is new and that requirements may be added to any system of regulation much more readily than they can be dropped.

Three other witnesses appeared at the fourth session. A. R. Williams, general manager of the United Electric Railways, Providence, R. I., urged that the bill be passed in order to protect investor's capital. Day Baker representing the Motor Coach and Bus Association of Massachusetts, favored regulation but felt that the time was not ripe for fixing rates. C. W. Fairchild, representing a group of casualty and indemnity insurance companies, felt that the bonding provisions of the proposed law should be amended since it was very doubtful whether his companies or any others could write insurance for the carriers under the bill as it now stood.

When the session was resumed after adjournment over the week end associations that favor the bill began their rebuttal presentations. John E. Benton of the National Association of Railroad and Utilities Commissioners, reiterated that few buses out of the total are in interstate service and consequently the state boards should have power to control these few along with the many. Most interstate lines, he continued, are comparatively short, operating through only two states. Before the Buck and Bush cases the states did well in regulating the interstate bus and should be empowered to take it up again. Regarding constitutionality of the proposed law Mr. Benton felt that if there were doubt it would be worth while to use it as a test.

At the hearing on the last day George H. Pride, representing the New York Board of Trade and Transportation, opposed the bill. Mr. Pride said no law is needed, that its passage would allow the railroads to stifle the bus business and consequently that it would be against the public interest.

The proponents of the bill then took up their rebuttal arguments. C. D. Cass, for the American Electric Railway Association, quoted Examiner Flynn's report concerning the abuses now found in the interstate bus industry. He said reliable transportation could be obtained only by a certification provision. Essential to any such act as the one contemplated are four points: Certification, protection for passenger, rate regulation, and the necessary machinery. He again brought up Mr. Benton's contention that operation through many states is exceptional. In the case cited by Mr. Brown the applicant would get some law student to file carbon copies of the application with each state board. Mr. Cass thought each state should have a veto power, with provision for appeal to the Interstate Commerce Commission.

A second session was held on this last day to complete the hearings. In concluding his remarks Mr. Cass charged that the N.A.C.C., is only attempting to obstruct passage of the bill. He could not understand why the manufacturers should appear at a matter concerning the operator.

E. W. Wakelee for the Public Service Co-ordinated Transport, made a clean cut plea for protection of existing utilities in the interest of the public. Cutthroat competition, now provided by interstate operators in the territory his company serves, is ruining the existing transportation companies. This is not to the interest of the public. He brought out specific instances of the irresponsibility of the bus operators. Competition is continuous. The regular operators must keep a huge reserve of equipment for peak loads, but their competitors avoid this burden. He believed that the newcomers in the field should bear their full share of the burdens of regulation.

Mr. Cass read into the record a statement by B. B. Cain, general counsel for the American Short Line Railway Association, to the effect that he was in harmony with attempts to secure passage of the bill as presented.

Alfred P. Thom, Jr., for the Association of Railway Executives, said the public was entitled to any form of transportation it wants, if it is economically sound. The rights of rail lines must be considered if the institution of bus operation will affect the steam road so substantially that it cannot carry out its obligations to the public. The mere existence of a rail line, however, should not be enough to cause refusal of a certificate to the bus company. To contend that investment in present bus lines should be protected by a grandfather clause while ignoring the investment in rail lines is inconsistent.

In summing up the case for those who favor the bill S. A. Markel said the necessity for regulation had been shown by the following:

Examiner Flynn's report.

The approval of the National Association of Railroad & Utility Commissioners.

The support of the Bus Division A.A.A.

The backing of the railroads, both steam and electric.

The admission by every witness before the committee to the effect that some form of regulation is necessary. Even the witness most opposed to the bill admitted that regulation regarding insurance was necessary. He said that the public have a tremendous investment in the highways and those persons who do not own private automobiles should have the use of this tremendously costly system by means of public automotive conveyances.

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Financial and Corporate

Diversion of Detroit Sinking Fund to Improvement Defended

During March, the net income of the Department of Street Railways at Detroit, Mich., after sinking fund payments was $26,362, compared with $67,402 a year ago. In March 43,761,251 passengers were carried. This is 500,838 fewer than in March, 1927.

According to William M. Hauser, auditor, $1,589,652 has been taken from the department's sinking fund for use in financing improvements of the system. He says the increased savings from these expenditures will make it possible to restore the original amounts to the fund before the final purchase payment is made by the city to the Detroit United in 1931.

The auditor's statement accompanying his monthly report refers to the communication addressed by the governmental committee of the Detroit Board of Commerce to Mayor Lodge and the Common Council with respect to certain reserves of the D. S. R. which were not funded. The funds for these reserves have been used for road and equipment (capital costs, so-called) temporarily.

Disbursements have been made for road and equipment (capital costs, so-called) in excess of the resources and funds available for that purpose, so that $1,589,652 will have to be provided from future earnings, in order to restore funds to certain reserves which it has been the department's policy heretofore to fund.

Washington Merger Bill Before Congress

Another move toward the proposed merger of the transportation lines of the District of Columbia was made on April 14 when the Public Utilities Commission transmitted the revised unification agreement to Congress. The agreement will have to be ratified by the Senate and House before it can be made effective.

The commission's letter of transmittal contained the draft of a proposed bill to make the merger agreement effective, together with a brief review of the history of the merger agreement and the correspondence between the District Commissioners and the Bureau of the Budget with respect to certain provisions providing for the transfer of the cost and maintenance of paving between car tracks and the payment of the salaries of crossing policemen from the consolidated company to the taxpayers of the District.

The merger plan had been before the Utilities Commission since Oct. 31, 1927, when Harley Peyton Wilson, principal owner of the Washington Rapid Transit Company, submitted a skeletonized outline of a scheme for consolidating the companies. This plan formed the basis of the merger agreement, which was later subscribed to by the boards of directors and stockholders of the companies. The agreement, however, was modified by the Public Utilities Commission before it approved the document.

Senator Capper, chairman of the Senate District Committee, is reported to have said that there was some doubt as to whether a merger bill could be passed at this session. He based this belief on expression that had come from several of his colleagues.

Purchase Discussions Resumed in New York

Negotiations between Samuel Untermyer, special counsel for the New York Transit Commission, and representatives of the Brooklyn-Manhattan Transit Corporation, have been resumed. The object is to reach an agreement for the purchase of the B.-M.T. properties by the city as the first step in a program of transit unification.

The main outlines of the proposed agreement are said to have been drafted and both sides are virtually in agreement. This tentative draft includes the method of exchange of securities in payment for the lines and practically everything except price.

A committee of engineers representing the city, the Transit Commission and the company has been at work for several weeks compiling data which will be used in the subsequent price negotiations.

The immediate concern of the conferees is said to be to find a way to overcome the handicap which resulted from the failure of the Legislature to pass the Untermyer bills. Mr. Untermyer does not believe the bills were essential, but the railway representatives felt differently about them. Now, however, they are said to be willing to join in a test suit in the courts to clear up some of the points involved.

Good Showing in Toledo in March

According to the March report of operations of the Community Traction Company, Toledo, Ohio, total revenue was $321,377 against $311,192 for the similar month last year. The statement showed 4,481,629 passengers compared with 4,358,747 for March, 1927. The showing this year is better than in any previous month this year or last year.

Due to the expiration of the sinking fund payments, the operations for March resulted in a surplus of $25,449 for the stabilizing fund after all charges required under the Milner ordinance. Operating expenses were $220,424 against $224,972 for March last year.

Considerable additional service has been operated and coach mileage has been increasing. The railway system showed 536,959 car-miles at a cost of 39.404 cents per car-mile and total revenue of 53.322 cents per car-mile. Buses were operated 121,989 miles with total revenue of 27.638 cents per mile and total expense and taxes of 22.559 cents per mile. The short special bus runs were most profitable, while the Long Belt was the most profitable car line.

Traffic, Fare and Wage Figures

Evidence of improvement in electric railway traffic was noted in January. The number of passengers carried was less than in January, 1927, but the amount of the decrease was not so great as that registered for December. The number of revenue passengers, including bus passengers, reported by 212 companies to the American Electric Railway Association for January, 1928, compared with January, 1927, is as follows:

January, 1928	843,241,464
January, 1927	860,850,256
Decrease, per cent	2.05

Average cash fares in cities of 25,000 population and over:

	Cents
February 1, 1928	8.1070
January 1, 1928	8.0953
February 1, 1927	7.9015

The average maximum hourly rates paid motormen and conductors in two-man service by companies operating 100 or more miles of single track:

	Average Hourly Rate, Cents	Index Number 1913 = 100 Per Cent
February 1, 1928	57.36	214.50
January 1, 1928	57.27	210.17
February 1, 1927	56.94	208.95

Report Lord Rothermere After British Columbia

Dispatches from London report that Lord Rothermere and associates had made a bid for the British Columbia Electric Railway, Vancouver, B. C., Canada. The deferred ordinary shares rose by nearly 40 points to £275 per share, while the preferred ordinary was up 60 points to £235. The reported offer for the railway stock is £280 the share for the deferred and £240 for the preferred. Stock of the British Columbia Electric is all of £1 par value. As of June 30, last, the company had about £8,000,000 of stock of various classes outstanding. Last December additional stock was created and this will probably be included in the deal, although that is not made plain.

The British Columbia Electric Railway is an English company. It operates the electric power, gas and railway services in Vancouver, New Westminster, Point Grey, etc., and Victoria and Esquimalt, serving in all an area

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in excess of 1,500 square miles. There has been a gradual segregation of assets under the principal Canadian company of the group, the British Columbia Electric Power & Gas Company, a British Columbia incorporation of 1926.

Total assets of the company as shown in the consolidated balance sheet for the year ended last June 30, are $66,856,866. Gross earnings for 1927 were $12,313,394.

Sale of Indiana Interurban Set for April 30

The property of the Indianapolis & Cincinnati Traction Company, Rushville, Ind., in the hands of a receiver, has been ordered sold on April 30 by Judge Will M. Sparks in Circuit Court after a motion for a new trial had been overruled. C. T. De Hore, a prospective purchaser, has an option on $2,600,000 of the company's bonds and it is expected that he will bid in the road in behalf of himself and his associates.

Terms of Proposed Ohio Merger Announced

After conference with the holders of substantial amounts of stock of the Northern Ohio Power Company, the directors of the Penn-Ohio Edison Company, on April 12, approved a plan and agreement of reorganization under which the Penn-Ohio Edison Company is to acquire at least a majority of the capital stock of the Northern Ohio Power Company. In furtherance of the proposal a meeting of stockholders of the Penn-Ohio Edison Company is to be held on May 1, 1928, to reorganize by (1) increasing its authorized shares of common stock to 2,000,000 shares without par value; (2) approving the plan; (3) authorizing the officers to take all necessary action.

Holders of capital stock of the Northern Ohio Power Company who deposit their certificates of stock properly endorsed will become parties to the plan. For each share of stock surrendered for exchange, if the plan becomes operative, there will be delivered ⅔ share of common stock of the Penn-Ohio Edison Company and ⅓ of an option warrant, series B, each option warrant, series B, entitling the holder to purchase 1 share of common stock of the Penn-Ohio Edison Company at $50 per share if exercised on or prior to Dec. 31, 1928; at $55 per share if exercised during the calendar year 1929; or at $60 per share if exercised thereafter but on or prior to its expiration date, Nov. 1, 1935.

The plan is to become operative only upon favorable action by stockholders of Penn-Ohio Edison Company, the approval of counsel, and the deposit of 70 per cent of the captial stock of the Northern Ohio Power Company or at least a majority of the capital stock of the Northern Ohio Power Company on or before May 15.

Upon completion of the exchange, giving effect to the deposit of all of the capital stock of the Northern Ohio Power Company, the outstanding capitalization of the Penn-Ohio Edison Company will be

$5,999,000 debentures 6 per cent due November 1, 1950.
$8,151,800 7 per cent prior preference stock.
49,229 shares $6 preferred stock (no par).
717,003⅛ shares common stock (no par), including scrip for fractional shares.
119,270 option warrants issued in 1925 expiring Nov. 1, 1935, for purchase of common stock at $25 per share.
166,650 option warrants, series B, for purchase of common stock at $50 per share to Dec. 31, 1928; at $55 during 1929, and at $60 thereafter to expiration date Nov. 1, 1935.

It is planned that the generating plants of the respective companies ultimately will be physically interconnected as are the railways at the present time. This should increase operating efficiencies, for it will diversify the load and since the Penn-Ohio property now has generating capacity greater than its immediate needs and ready means of adding thereto should benefit the Northern Ohio, which is now purchasing a substantial part of its power requirements.

Dividends are being paid by the Penn-Ohio Edison Company at the rate of $1 per share in cash and 1/25 of a share of common stock per annum.

Increase in Pittsburgh's Net Revenue

Recession in many lines of business and the continued subnormal condition of the bituminous coal mining industry affected the Pittsburgh Railways throughout the year 1927

OPERATING revenues of Pittsburgh Railways, Pittsburgh, Pa., for the year 1927 were $21,525,912, a decrease of $362,447, or 1.6 per cent as compared with 1926. By constant attention to details of management, scientific research in operating problems and the adoption of new economical methods, the company was enabled to reduce operating expenses $390,446, or 2.2 per cent, to $17,066,567. Net revenues after depreciation increased $27,999, or 0.6 per cent, to $4,459,345. The company was able to meet all obligations in accordance with its operating agreements and closed the year with a satisfactory addition to surplus.

As a result of the company's belief that its task of rendering street car service is facilitated and there is greater likelihood of improvement in operations when the many problems which arise are approached from the standpoint of scientific research, recourse to this method of approach is playing an important part in placing operations on an efficient basis since light is thus being thrown on various problems by the dissemination of information throughout the organization.

Considerable time has been devoted to designing an improved street car that will attract more car riders. In this age of keen competition for traffic, new cars must feature quicker acceleration and still more comfortable riding qualities. Further additions to equipment have awaited the results of joint studies with car builders based on experimental cars under construction.

During 1927 the operations of the company continued to show a steady improvement. The number of car failures was reduced from an average of 1,203 per month in the preceding year to an average of 182 per month. Fewer cars awaited shop repairs. The installation of meters on all cars to measure the current consumed in daily passenger service is making it possible to isolate instances of uneconomical practices requiring instruetion and to discover defective equipment more quickly. Installation of a mechanical device which records the spacing of cars on the different routes was begun and will be completed during the coming year. The purpose is better maintenance of schedules through automatic communication to

SUMMARY OF INCOME AND PROFIT AND LOSS OF PITTSBURGH MOTOR COACH COMPANY FOR 1927

Operating revenues		$483,569
Operating expenses:		
Maintenance of equipment	$98,615	
Traffic	7,414	
Transportation	187,364	
General administrative	25,759	
Other general	27,871	
Taxes	18,932	365,955
Net revenue from operations		$117,613
Non-operating revenues	$1,504	
Non-operating expenses	110	
Net revenue from other operations		1,393
Gross income		$119,007
Income charges:		
Interest on unfunded debt	$12,043	
Less interest charged to construction	841	11,201
Net income before appropriation		$107,805
Appropriation for retirement (depreciation) reserve		62,848
Net income for the year		$44,957
Surplus, Jan. 1, 1927		20,851
Gross surplus		$65,808
Deductions from surplus:		
Loss on equipment retired from service	$11,381	
Miscellaneous (net)	1,392	12,773
Surplus, Dec. 31, 1927—per balance sheet		$53,035

STATISTICS OF PITTSBURGH MOTOR COACH COMPANY

Garages operated	1
Routes operated	6
Route miles operated (single way)†	25.2
Coaches owned	50
Revenue coach-miles operated††	1,348,333
Passengers carried	1,834,752
Passenger revenue per revenue coach-mile, cents*	36.82
Average fare per passenger, cents	24.70

*Including special coach revenue and mileage.
†Excluding 24 and 74 sightseeing routes.
††Including special coach mileage.

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SUMMARY OF INCOME OF PITTSBURGH RAILWAYS FOR THE YEAR 1927

(Prepared in accordance with the terms of the agreement between city of Pittsburgh, sundry other municipalities, Philadelphia Company and Pittsburgh Railways)

Gross revenue from street railway operations		$21,365,542
Operating expenses:		
Maintenance of way and structures	$995,558	
Maintenance of equipment	1,047,380	
Traffic	170,047	
Power	2,034,998	
Transportation	7,463,135	
General	1,036,817	
Miscellaneous	1,508,730	
Depreciation	2,055,245	
Taxes	608,137	16,920,047
Net revenue from street railway operations		$4,445,495
Auxiliary operations:		
Operating revenues	$160,369	
Operating expenses (including depreciation)	146,520	
Net revenue from auxiliary operations		13,850
Total net revenue from operations		$4,459,345
Non-operating revenues:		
Rental of real estate and buildings	$20,461	
Interest and discount	150,203	
Miscellaneous	4,191	
Total	$174,856	
Non operating expenses	9,198	
Net revenue from other operations		165,658
Gross income		$4,625,003
Income Charges:		
Items under agreement:		
Return of 6 per cent on property valuation of $62,500,000	$3,150,000	
Return of 6 per per cent on additional capital for new property	328,800	
Payments to county of Allegheny, city of Pittsburgh and other municipalities in lieu of licenses, paving assessments, etc.	429,168	
Amortization of debt discount and expense on additional capital	67,325	
Items not under agreement:		
Interest on judgements and settlements	1,324	
Rental of seventeenth Street incline plane	7,102	4,583,720
Net income for the year		$41,283

headquarters, which provides means for meeting emergencies and reducing delays due to blockades. Every means is employed, through close supervision and control of operations, to insure more reliable service.

The one-man car has been developed to a point where it compares with the two-man car in safety, speed and comfort. To these qualities it adds economy of operation which permits the company to give more frequent service. There are now 247 cars of this type on 33 routes, and this operation is proving uniformly successful. The fact that last year 23.01 per cent of the total mileage was one-man operated, as compared with 14.67 per cent in 1926, indicates the growth of this class of service.

In 1927 the Pittsburgh Railways operated its cars at the rate of 3,091 miles per accident, an improvement of 4.2 per cent over 1926. Accidents involving employees decreased 8.75 per cent, and those involving the public reduced 3.5 per cent. These records are indicative of accomplishments growing out of the company's accident prevention policy. In recognition of this performance the company received a certificate of honorable mention in the Anthony N. Brady Memorial Award for excellence in accident prevention and health promotion work.

The effort of the management to inform employees concerning the problems of management and to obtain their suggestions in formulating plans and policies has, according to President A. W. Robertson, met with a ready response and "the co-operation received from employees has helped to work out a situation which could be handled successfully in no other way."

The report says that the close working relations which prevailed during the year between the Traction Conference Board and the company helped materially in the operations of the property. During the last twelve months seven municipalities entered this quasi-partnership agreement, so that at the close of the year 73 per cent of the total population served and approximately 75 per cent of the total paved track mileage operated came under this agreement.

No definite plan has been evolved for readjustment and improvement of the financial structure of the railway system as a whole, but studies are progressing towards a solution of this complex problem.

During the year, 32.6 miles of track was reconstructed and 4.77 unused miles was abondoned. The report says:

The personnel is interested and its morale high. The management is committed to scientific research and progressive methods. These factors, combined with good public relations, present a promising outlook and the management is pledged to continue efforts to render more and better service to patrons and create a progressively better situation for car riders and investors.

STATISTICS OF THE PITTSBURGH RAILWAYS

Miles of road	327.25
Miles of track	585.99
Carhouses operated	20
Car shops	1
Trainmen's quarters and administration buildings	12
Rolling Stock:	
Passenger cars—motor	1,207
Passenger trailers—motorized	81
Passenger trailers—non-motorized	144
Freight cars	9
Snow sweepers	39
Snow plow	1
Snow scrapers	17
Sand cars	27
Flat cars	65
Work cars, etc.	74
Total cars	1,664
Passengers Carried:	
Revenue	262,061,272
Free transfer	38,243,105
Free	919,723
	301,224,100
Passengers carried (revenue, free transfer, free and estimated extra rides on passes)	389,615,236
Car-miles operated	41,588,216
Car-hours operated	5,045,323
Passenger revenue per revenue car-mile, cents	50.51
Average fare per revenue passenger, cents	7.97
Average fare per passenger (revenue, free transfer and free), cents	6.94
Average fare per car ride (total passengers carried), cents	5.36

$2,496,769 Paid to Chicago by Surface Lines

Payments aggregating $2,496,769 and representing 55 per cent of the 1927 net receipts were made on April 11 to the Chicago City Council traction fund by the Chicago Surface Lines under the terms of the original 1907 ordinance. Of this total, the Chicago Railways, now operated by federal receivers, paid $1,562,714 and the Chicago City Railway and subsidiary lines, $934,055. The payments were made as the result of the extension on March 30 of the Surface Lines franchises for the fourteenth time since the twenty-year grants expired a year ago last January. The present extension, like the six previous ones, is for a 30-day period.

Sunday Pass Record in St. Louis

The St. Louis Public Service Company, St. Louis, Mo., on Sunday, April 8, sold 43,000 unlimited-ride tickets at 25 cents each. The passes were good between 3 a.m., Sunday and 3 a.m., Monday. This set a new record for the company.

Six Lines Continued in Portland on Reduced Schedule

After a study of the evidence by the Public Utilities Commission and officials of the Portland Street Railway, Portland, Me., operated under lease by the Cumberland County Power & Light Company, it was decided to continue the operation of cars on six of the seven lines on the reduced schedule plan. A month's trial has been ordered by the commission until May 15. In this way it is hoped to reduce the losses sufficiently so as to maintain service. The other line of the seven petitioned for abandonment—the Spring Street line—will be supplanted by bus service. If the plan does not succeed the commission will continue the hearings after May 15, when it will be settled that the lines are either to be discontinued or supplanted by another type of service.

At the hearing Manager Fred D. Gordon cited instances of decreased revenues, mounting costs of operation and construction, even with higher tariff. The deficit in 1927 was $171,000. The suggestion of higher fares was rejected.

F. W. Hinckley, Republican candidate for nomination as Governor, said that since the Cumberland company was operating the lines under lease it had no legal right to seek to put into effect a plan that might tend to destroy property rights or franchise values.

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Kansas Line Would Issue Bonds

An application has been filed by the Kansas City, Merriam & Shawnee Electric Railway with the Kansas Public Service Commission for permission to issue $35,000 in first mortgage bonds and 2,000 shares of preferred stock with a value of $10 a share. The purpose is to provide funds to construct an electric line from Southwest Boulevard, Kansas City, Kan., to Rose Hill in Johnson County. At the same time Herman Sonken applied to sell to the company a right-of-way owned by the old Kansas City, Lawrence & Topeka Railway for some years.

Question of Inter-Company Charges Settled in Dallas

Surplus reserves of the Dallas Railway & Terminal Company, Dallas, Tex., have been swelled to a total of more than $583,000 by action of the directors of the Dallas Power & Light Company in restoring about $240,000 in overpayments of power bills by the railway. They cover a period of several years and result from the agreement by the power company to a basis of rate charges to the railway which the city insists is the correct one. Both the action of the railway directors and the power company directors comply with request made by John W. Everman, the supervisor of the city public utilities, during and previous to the recent public hearing on the application for higher car fares.

Action just taken came after extended conferences between Mr. Everman and officials of the affected companies. C. E. Calder, president, and C. W. Davis, vice-president and general manager of the Dallas Power & Light Company, were credited with working out the details.

$1,444,330 Award to Fonda Road Upheld

The award by the Hudson River Regulating District Commission of $1,444,330 for the Fonda, Johnstown & Gloversville Railroad right-of-way in the Sacandaga Valley has been upheld unanimously in a decision of the Appellate Division, third department. The decision removes the last legal barrier to the huge project which is to impound a lake 25 miles long and 5 miles wide as a storage for the Hudson River watershed, unless the Appellate Division consents to permit the railroad to take an appeal to the Court of Appeals.

The railroad had asked $4,500,000 for its property and the Hudson River Regulating District Commission had offered $550,000 before the commission made its survey. The price actually paid for it, $1,440,330, was held as fair by Justice Whitmyer, who directed the commission to resume work in the area.

The court held in short that the Hudson River Regulatory Commission's work is both constitutional and necessary as a health measure for the protection of the inhabitants of the Capitol district and that because power is to be incidentally developed by impounding water and building dams it is not a private enterprise even though 95 per cent of the project is financed by private corporations, because public good is being served and the use of all of the resultant power is subject to regulation by the state for the public good.

Texas Line Sold

Sale of the railway system of the Wichita Falls Traction Company in Wichita Falls, Tex., is announced by Frank Kell, president of the company. The purchaser is A. P. Barrett, Fort Worth, the head of electric power interests in Texas. The consideration was not announced, but officials said that assets of the company total over $500,000. The line covers 17 miles.

A. P. Barrett will succeed Mr. Kell as president and the latter will be chairman of the board of directors. Other officers of the company will be L. L. Albeitton, vice-president and general manager; A. L. McNab, treasurer; and William N. Bonner, general attorney.

Capital Increase Before Philadelphia Stockholders

A special meeting of stockholders of the Philadelphia Rapid Transit Company, Philadelphia, Pa., will be held on June 18 to vote on increasing the preferred stock $5,000,000 to $35,000,000, making total authorized capitalization $65,000,000 of which $30,000,000 is common stock.

Title has been taken by the Mitten Bank Securities Corporation, Philadelphia, Pa., from G. H. Daley to the 13-acre plant of the Commercial Truck Company at the southwest corner of Hunting Park Avenue and American Street for a price of $500,000, of which $300,000 remained on mortgage. The property has been leased to the Philadelphia Rural Transit Company, a subsidiary of the Philadelphia Rapid Transit Company, to be occupied by shops in connection with the operation of its buses. The Philadelphia Rapid Transit Company has conveyed to the Motor Real Estate Company the carhouse property at the southeast corner of 27th Street and Allegheny Avenue, assessed at $200,000.

Canadian Border Cars Still Run at Loss

Gross operating revenue of the Hydro Electric Railways, Windsor, Ont., operating in the so-called border cities, was $1,069,631 last year, as against operating expenditures of $1,089,611. On the other hand, the gross revenue for the last fiscal period was substantially higher than during the 1926 season, the figures being cited as $1,031,443 for 1926, compared with $1,069,631 for 1927. Likewise, 18,928,737 passengers were carried last year compared with 18,410,520 in 1926, or an increase of 518,217.

Dividend on Eastern Massaschusetts Common in 1929

Since March 12, the day on which Public Trustee Arthur G. Wadleigh of the Eastern Massachusetts Street Railway expressed the opinion that common dividends would be started in 1929, the stock issues of the road have advanced five to ten points on the Boston Stock Exchange. To the highs they are up as follows: First preferred, 74 to 84¾; preferred B, 70⅞ to 79¾; adjustment, 53 to 62; common, 30¼ to 41½.

For the 1927 calendar year the public trustees reported net earnings after all deductions of $772,060 and paid preferred and adjustment stock dividends of $866,201, making it necessary to draw upon surplus to the extent of $94,141. Last year there was a charge against income of $276,000 for amortization of obsolete equipment account, which charge has since been eliminated inasmuch as the account has been entirely amortized. Had this charge not been in effect last year the road would have had $1,048,060 available for dividends, equal after all the senior stock dividends to $2.13 a share on the 85,254 shares of common.

Another factor tending to enlarge the earnings applicable to the common is the reduction of funded debt. As bonds mature and are paid off the interest charge is reduced. Naturally the interest saving is greater than the interest loss on the cash or investment securities used to retire the maturing debt.

Mr. Wadleigh felt that dividends would not be initiated at $6 a share on the common stock, but at a rate that would be "a very good return on its present market value." As the market value of the stock at that time was about $30 a share, presumably a dividend of $2 to $3 a share would be regarded as a very good return.—*Barron's*

Earnings of Ohio Road Impounded

Judge Frank M. Krapp in Common Pleas Court has ordered Willitts H. Sawyer, receiver of the Springfield Railway, Springfield, Ohio, to impound all receipts for the benefit and protection of the Real Estate, Land Title & Trust Company, Philadelphia, trustee under the indenture securing outstanding bonds. The trustee asserted in its application that the railway had defaulted in the payment of bond interest. The ruling by the court precludes the receiver from paying out any funds except those necessary for the actual operation of the railway and the expenses of the receivership.

Would Discontinue Short Kansas Interurban

The United Power & Light Corporation, Abilene, Kan., applied to the State Public Service Commission recently for permission to discontinue its electric interurban line between Junction City and Fort Riley.

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Personal Items

C. A. Brooks Honored at Dinner

Friends of C. A. Brooks, who shapes the destinies of railway properties owned by the National Electric Power Company, honored him at a testimonial dinner in the Commodore Hotel, New York, on the evening of April 16.

W. G. Gove, superintendent of the Brooklyn-Manhattan Transit Corporation, acted as toastmaster. The speakers were J. S. McWhirter, Joseph K. Choate, Silas Hinckley and Harry Reid. All of the speakers, including Chairman Gove, were railway executives with whom Mr. Brooks has formerly been associated, while Mr. Reid is president of the company with which Mr. Brooks is now connected. Thus, as these men reminisced they outlined the entire experience of their guest in the railway business.

Mr. Brooks joined the forces of the National Electric Power Company when that organization acquired railway properties formerly controlled by A. E. Fitkin Company. He had been general manager of the Poughkeepsie & Wappingers Falls Electric Railway, Poughkeepsie, N. Y., to which property he went in April, 1913, after having served as a member of the J. G. White staff in New York. He left Poughkeepsie in March, 1925, to join the Fitkin organization.

Back in 1902 Mr. Brooks entered the transportation business with the Brooklyn Rapid Transit Company. Later he was with Sanderson & Porter for a short period, but left their employ to enter the service of the Third Avenue Railroad, New York. Following that he directed the construction of the so-called South Shore railway lines in Long Island and in 1912 joined the staff of the White organization.

Members of Montreal Commission Re-Named

J. F. Saint-Cyr, chairman of the Montreal Tramways Commission, and J. S. Archibald, member of the same commission, have been reappointed by provincial order-in-council to the same positions for a further period of ten years.

Both these members were named to the commission when it was originated in 1918. The third member of the commisstion is Paul Beique, appointed in 1926, upon the death of L. A. Herdt, the third original member of the commission.

The Montreal Tramways Commission is the governing body as to tramways matters in Montreal, controlling the Montreal Tramways in all matters of expenditure for capital purposes, and also controlling other expenditure. Appeal lies in the Quebec Public Service Commission only in certain matters, notably, as to what is to constitute capital expenditure, since the company is allowed 6 per cent on all such expenditure.

Mr. Saint-Cyr left the provincial criminal bench in 1918 to take the chairmanship of the Tramways Commission. He had sat in the Court of Sessions for two years up to that time, but previously had been judge at St. Johns. He devotes all his time to the commission.

Mr. Archibald is a well-known architect. He recently built several schools, the forum on St. Catherine Street, and was one of the consulting architects for the new court house.

Mr. Beique is a civil engineer, as was his predecessor, Dr. Herdt.

The city of Montreal is a partner in the tramways contract, and it is as representative of the city that the commission acts.

New Honor for H. B. Potter

H. B. Potter, general manager of the United Railways & Electric Company, Baltimore, Md., since 1925, was elected a vice-president at the annual meeting held on April 11. "Bert" Potter is well known in railway circles especially for his activities in Maine and Massachusetts. It was from the Boston Elevated Railway, where he had served as assistant general manager under Edward Dana and previously as assistant to Matthew C. Brush, that he went in 1923 to Baltimore as assistant to the president of the United Railways & Electric Company. Before going to Boston where his legislative, operative and safety work, covering a period of thirteen years were especially commendable, he had been identified with the building and operation of electric railways in Maine.

Mr. Potter was born in Providence, R. I., on Nov. 14, 1881. He was educated in the public schools of Cambridge, Mass, and at Lowell Institute, from which he was graduated in electrical and mechanical engineering.

WARREN VIESSMAN, an engineer formerly with the United Railways & Electric Company, Baltimore, Md., has been appointed head of the Bureau of Mechanical-Electrical Service, one of the divisions of Baltimore's Department of Public Works. In addition to being with the United Railways & Electric Mr. Viessman has been associated with the Westinghouse Company, the Consolidated Gas, Electric Light & Power Company and the Union Shipbuilding Company. His most recent position was with the Consolidated. He is engineering officer in the United States Naval Reserve. He was graduated from the Baltimore Polytechnic Institute and the engineering department of Johns Hopkins University.

C. E. Bostwick at Savannah

Charles E. Bostwick, for six years superintendent of the Jacksonville Traction Company, Jacksonville, Fla., and more recently manager of the White Star Stage Line at Tampa, organized to take over bus properties reported to have been purchased by Stone & Webster, has been assigned to the Savannah Electric & Power Company.

R. J. O'Brien in New Rôle with Westinghouse

R. J. O'Brien has been appointed assistant to the transportation sales manager of the Westinghouse Electric & Manufacturing Company, having the Atlantic seaboard district as his territory. Since April, 1920, Mr. O'Brien has been on the staff of F. H. Shepard, director of heavy traction of the Westinghouse Company, and has been the Westinghouse representative on the Virginian electrification. Mr. Shepard's staff more recently has been engaged in self-propelled car work.

After he was graduated from the University of Minnesota, Mr. O'Brien was made resident engineer of the Great Northern Railway at New Rockford, N. D., and had charge of the construction of 10 miles of main line railroad and the new engine division terminal. Following this, for approximately a year and a half, Mr. O'Brien was an apprentice at the Westinghouse plant at East Pittsburgh, later being assigned to railway engineering.

From 1913 to 1917 he was engaged in general engineering work for Gibbs & Hill, consulting engineers. His work was principally in financial and engineering estimates, plans and the supervision of steam railroad electrifications. He was the engineering supervisor of the electrical features of the Pennsylvania Railroad on the Philadelphia-Paoli-Chestnut Hill electrification and was in charge of electrical tests of the Norfolk & Western electrification. From 1917 to 1920 Mr. O'Brien was an officer of the A.E.F.

Obituary

GEORGE PARTRIDGE BULLARD, chairman of the Board of Public Trustees of the Eastern Massachusetts Street Railway, Boston, Mass., since late in 1925, died suddenly on April 17. He had served on the board since 1924, when he was appointed by Governor Channing Cox. In 1901 and 1902 he was a member of the Massachusetts Legislature, serving as chairman of the House committee on railroads. At the time of his death Mr. Bullard was president of the West Newton Savings Bank. He was 71 years old.

CHARLES FORBES, connected with the freight department of the Indianapolis & Cincinnati Traction Company, Indianapolis, Ind., died recently at his home in Connersville. He was 53 years old.

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Manufactures and the Markets

$8,000,000 Long Island Track Changes

The Long Island Railroad, New York, N. Y., has been ordered by the Transit Commission to eliminate 31 grade crossings in Queens, New York, at an estimated cost of $8,000,000. The order is in accordance with the plan of the railroad and work is expected to start at once. Twenty-seven of the crossings are between Rockaway Park and Arverne, N. Y., and four are in Corona, N. Y.

On both branches the tracks of the Long Island Railroad will be elevated. On the Rockaway division the tracks will be placed on a steel and concrete structure. In Corona the tracks will be raised on an embankment sufficiently high to allow them to be carried over the four streets on bridges with only a slight depression of the street grade.

The structure to be erected will allow a street clearance of 14 ft. on existing and new streets which may be constructed. The structure will have a concrete floor and will be so solidly built as to make train operation possible with very little noise. Provision will be made for additional tracks which may be required in the future.

Committee Approves Vitrified Paving Brick Sizes

The five recognized varieties and sizes of vitrified paving brick have again been approved as standard for the coming year by the U. S. Department of Commerce committee on simplification of variety and standards for paving brick. The five recognized varieties are:

Plain wire-cut brick	2¼x4x8¼ in.
Plain wire-cut brick	3x4x8¼ in.
Plain wire-cut brick	3¼x4x8¼ in.
Repressed lug brick	4x3¼x8¼ in.
Wire-cut lug brick	4x3¼x8¼ in.

Locomotives for Paulista

Three electric locomotives have been built for the Paulista Railway, Brazil, by the General Electric Company, Erie, Pa. They are of the geared-motor type, and each locomotive has two driving trucks articulated together, and a cab mounted on center plates. Each driving truck has three individually-driven axles and is provided with a single-axle radius-bar guiding truck.

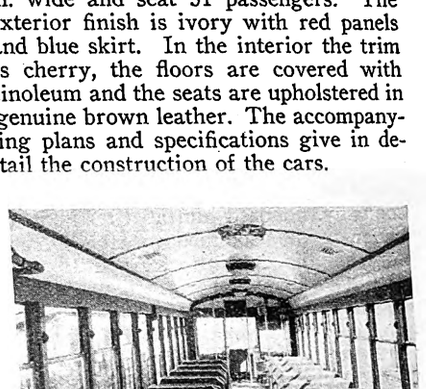
Direct current is obtained from an overhead trolley at 3,000 volts and is supplied to the traction motors which are wound for 1,500 volts and connected, each pair in series, across the line. Locomotive speed is controlled by series-parallel connections of the motors using accelerating rheostats, and by reductions in motor field strength.

Control is of the standard electro-pneumatic type arranged for non-automatic, multiple-unit operation. Current is collected by means of two air-raised trolleys, either of which has sufficient capacity to supply the entire locomotive. Control couplers are provided by means of which the two locomotives can be operated from a single controller. Each locomotive is equipped with a dynamotor which supplies 1,500 volts for the operation of auxiliaries.

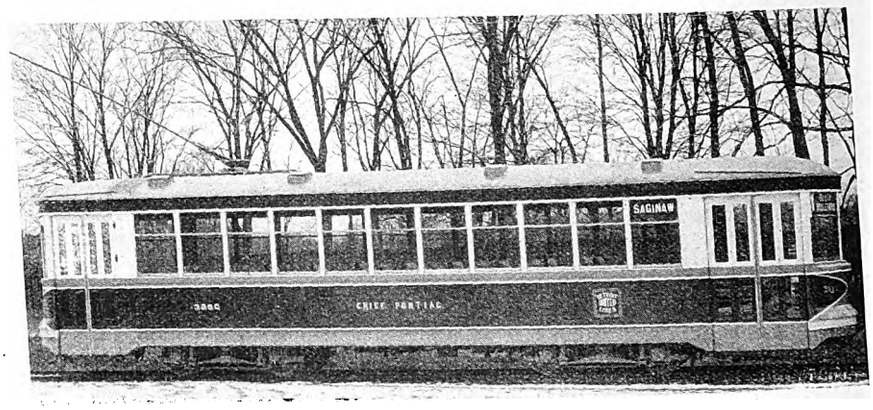
Detroit United Cars Delivered

Ten cars were recently delivered to the Detroit United Railway, Detroit, Mich., from the shops of the G. C. Kuhlman Car Company, Cleveland, Ohio. The cars are of the semi-steel type with arch roofs.

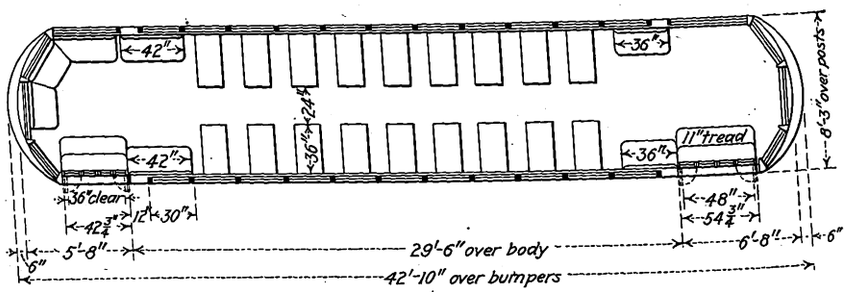
Although the cars weigh only 30,700 lb. they are 42 ft. 10 in. long, 8 ft. 5¾ in. wide and seat 51 passengers. The exterior finish is ivory with red panels and blue skirt. In the interior the trim is cherry, the floors are covered with linoleum and the seats are upholstered in genuine brown leather. The accompanying plans and specifications give in detail the construction of the cars.



The upholstering is in brown leather



One of the ten cars recently delivered to the Detroit United Railway



Floor plan of the 51-passenger Detroit cars

Name of Railway	Detroit United Railway
City and State	Highland Park, Michigan
Number of units	10
Type of unit	one-man, two-man, motor, passenger, city, single-end, double-truck
Number of seats	51
Builder of car body	G. C. Kuhlman Car Company
City and State	Cleveland, Ohio
Date of order	9/27
Date of delivery	Mar. 1, 1928
Weights:	
Car body	16,120 lb.
Trucks, motors	12,480 lb.
Equipment	2,100 lb.
Total	30,700 lb.
Bolster centers	19 ft.
Length over all	42 ft. 10 in.
Length over body posts	29 ft. 6 in.
Truck wheelbase	5 ft. 4 in.
Width over all	8 ft. 5¾ in.
Height, rail to trolley base	10 ft. 5 in.
Window post spacing	30 in.
Body	Semi-steel
Roof	Arch
Doors	End, folding
Air brakes	Westinghouse
Axles	Brill
Car signal system	Faraday
Compressors	DH-20
Conduit	Duratube
Control	K
Destination signs	Hunter
Door mechanism	National Pneumatic
Fare boxes	Cleveland
Finish	Lacquer
Floor covering	Battleship linoleum
Gears and pinions	General Electric
Glass	DSA selected
Hand brakes	Brill geared type
Hand pole	Cleveland
Heaters	Consolidated Car Heating Company
Headlights	Golden Glow RM 96
Headlining	Agasote
Interior trim	Cherry
Journal bearings	Brill
Journal boxes	Brill
Lamp fixtures	Dayton Mfg. Company, No. 341
Motors	4 GE. 258, inside hung
Painting scheme	Stream line, red panels, ivory above belt, blue skirt
Roof material	Poplar
Safety car devices	Safety Car Devices Company
Sash fixtures	Adams & Westlake
Seats	Brill No. 105
Seat spacing	30 in.
Seating material	Genuine brown leather
Steps	Stationary
Step treads	Kass
Trolley catchers	Earl
Trolley base	O.B.
Trolley wheels	General Electric
Trucks	Brill 177 EX
Ventilators	Nichols-Lintern
Wheels	Rolled steel, diameter 26 in.
Wheelguards	Brill

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Paris May Get Danville Line

Paris, Ill., has hopes that the proposed railway connection between Danville and Indianapolis may be so arranged as to serve it, thus eliminating the necessity of building a new bridge over the Wabash and reducing new track construction to less than 13 miles.

Paris, already served by railway from Terre Haute, proposes that the city street line in Paris—for which there no longer are any cars—be donated to the railway companies, and that the tracks be extended by the railway people from Paris to Ridgefarm, there to link up with the present Danville-Ridgefarm service of the Illinois Traction Company.

From Danville to Indianapolis via Paris and Terre Haute would be, roughly, 30 to 35 miles farther than would the Indianapolis route via Crawfordsville.

Twenty Cars Being Constructed for N. Y., W. & B. Ry.

Construction of the twenty new cars for the New York, Westchester & Boston Railway, New York, is under way in the plant of the Osgood Bradley Car Company, Worcester, Mass. These cars are of the all-steel type made up of unit side frame, Stillwell design. The 11,000-volt single-phase trolley feeds through one of two pantographs through high tension leads to the transformer. The voltage is then stepped down for use on motors and auxiliary circuits.

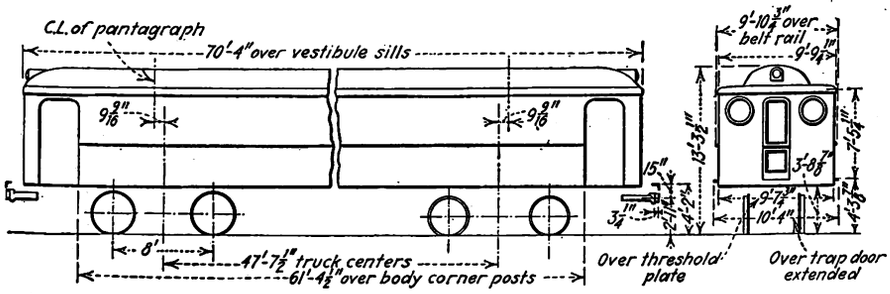
These cars, for heavy suburban service, are 72 ft. 7¼-in. long and 9 ft. 10¾-in. wide. The car body weighs approximately 63,200 lb. and the total weight of the car is about 124,830 lb. The detailed features of the cars are given in the accompanying specifications and plans.

Exhibitograph No. 5

Intending Exhibitors Should Answer All Questions on The Exhibit Space Application for the A.E.R.A. Convention

Unanswered Questions Mean Delay

CO-OPERATE WITH THE EXHIBIT COMMITTEE



General dimensions of the twenty cars being built for the New York, Westchester & Boston Railways by the Osgood Bradley Car Company

Name of Railway	New York, Westchester & Boston Railway
City and State	New York City
Number of units	20
Type of unit	Motor, passenger, suburban, double end, double truck
Number of seats	80
Builder of car body	Osgood Bradley Car Company
City and state	Worcester, Mass.
Date of order	12/14/27
Date of delivery	1st del. 5 mos. after date of contract
Approx weights:	
Car body	63,200 lb.
Motor	16,585 lb.
Trucks	14,738 lb.
Trailer	14,738 lb.
Air	5,572 lb.
Equipment	10,905 lb.
Total elec. mot.	13,830 lb.
Bolster centers	47 ft. 7½ in.
Length over all	72 ft. 7½ in.
Length over body posts	61 ft. 4½ in.
Truck wheelbase	8 ft. 0 in.
Width over all	9 ft. 10¾ in.
Height, rail to trolley base	13 ft. 3½ in.
Window post spacing	2 ft. 8-13/1 in.
Body	All-steel
Roof	Steel
Doors	Center and end sliding
Air brakes	Westinghouse—AMUE
Armature bearings	Plain
Axles	5½x10, M.C.B.
Car signal system	Westinghouse
Compressors	Westinghouse XD2EG
Conduit	Metal
Control	Westinghouse AB, 32 volts
Couplers	Pitt, 9 in. face
Curtain fixtures	Curtain Supply Company
Curtain material	Pantasote No. 85
Destination signs	Morton Manufacturing Company
Door mechanism	National Pneumatic Company, type GS-8EVP
Energy saving device	Watthour meter
Finish	Enamel
Floor covering	Tucolith
Gears and pinions	Nuttall BP
Glass	Plate
Hand brakes	H. B. Blackall
Hand straps	Bisco Steelkar No. 12
Heat insulating material	3 ply Salamander and Turock
Heaters	No. 405-E
Headlights	Golden Glow, 14 in.
Headlining	Agasote
Interior trim	Agasote and steel
Journal bearings	Plain
Journal boxes	Symington A.R.A.
Lamp fixtures	Safety
Motors	2 Westinghouse 409B, outside hung
Painting scheme	Green, white ceiling
Pantagraph	Nuttall No. 131-A
Roof material	Steel
Safety car devices	Deadman's Automatic Airbrake
Sash fixtures	O. M. Edwards
Seats	Hale & Kilburn Company
Seat spacing	2 ft. 8-13/16 in.
Seating material	Pantasote No. 85
Slack adjusters	American Steel Foundries & Westinghouse
Steps	Stationary
Step treads	Kass
Trucks	Built up, Stillwell design
Ventilators	Utility
Wheels	Rolled steel-tire diameter 36 and 42 in.

G.E. Orders Increase

Orders received by the General Electric Company for the first three months of the present year amounted to $79,925,840, compared with $77,550,581 for the corresponding quarter in 1927 and with $86,433,658 for the first quarter of 1926. This represents an increase of 3 per cent for the first quarter of 1928 over the corresponding period of 1927.

N.E.M.A. Indorses Principles of Business Conduct

The board of governors of the National Electrical Manufacturers Association has indorsed the "Principles of Business Conduct" which is the result of a study of many codes of ethics that have been adopted by many lines of business, supplemented by suggestions from the membership.

The name, "Principles of Business Conduct," and the first section, designated "General Principles" was adopted *in toto* from the code developed and adopted by the Chamber of Commerce of the United States.

The second section deals with competitive bidding and is given in full as follows:

1. The electrical manufacturers indorse the principle of a one-price policy.

2. A request for competitive prices on the part of a buyer involves definite obligations toward all bidders. The electrical manufacturers indorse as in the interest of sound, ethical and economic relations between buyer and seller the following principles to apply to competitive bidding under any specific inquiry: (a) That the bids be considered as confidential information between buyer and bidder until all bids are in and the buyer has placed the business. (b) That bidders exchange where practicable full information regarding their bids after the business is placed.

3. Where specifications call for various items involving different types and classes of apparatus, the relative merit of the different bids is best determined and freedom of choice on the part of the buyer promoted if each bidder quotes segregated prices at which any individual item would be accepted.

The succeeding sections deal with the relations of manufacturers to customers, agents or others and the relation of manufacturers to each other.

ROLLING STOCK

Boston & Worcester Street Railway, Framingham, Mass., has added to its fleet of fifteen Macks, two additional Macks of four-cylinder, parlor-car chassis, 25-passenger capacity, with Lang bodies.

Boston, Revere Beach & Lynn Railroad, Boston, Mass., placed an order for a 29-passenger A.C.F. de luxe urban coach.

Interstate Street Railway, Attleboro, Mass., bought two 27-passenger A.C.F. parlor coaches.

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ELECTRIC RAILWAY MATERIAL PRICES—APRIL 17, 1928

Metals—New York

Copper, electrolytic, cents per lb	13.9625
Lead, cents per lb	6.10
Nickel, cents per lb	35.00
Zinc, cents per lb	6.10
Tin, Straits, cents per lb	52.75
Aluminum, 98 or 99 per cent, cents per lb.	24.30
Babbitt metal, warehouse, cents per lb.:	
Commercial grade	57.00
General service	31.50

Bituminous Coal

Smokeless Mine Run, f.o.b. vessel, Hampton Roads, gross tons	4.15
Somerset mine run, f.o.b. mines, net tons	1.875
Pittsburgh mine run, Pittsburgh, net tons	1.975
Franklin, Ill., screenings, Chicago	1.825
Central, Ill., screenings, Chicago	1.675
Kansas screenings, Kansas City	2.375

Track Materials—Pittsburgh

Standard steel rails, gross ton	$43.00
Railroad spikes, drive, ⅝ in. and larger, cents per lb	2.80
Tie plates (flat type), cents per lb	2.15
Angle bars, cents per lb	2.75
Rail bolts and nuts, cents per lb	3.80
Steel bars, cents per lb	1.875
Ties, white oak, Chicago, 6 in.x8 in.x8 ft.	$1.40

Hardware—Pittsburgh

Wire nails, base per keg	2.65
Sheet iron (24 gage), cents per lb	2.85
Sheet iron, galvanized (24 gage), cents per lb.	3.70
Galvanized barbed wire, cents per lb	3.35
Galvanized wire, ordinary, cents per lb	3.10

Waste—New York

Waste, wool, cents per lb	16–20
Waste, cotton (100 lb. bale), cents per lb.:	
White	16–19.50
Colored	11–16

Paints, Putty and Glass—New York

Linseed oil (5 bbl. lots), cents per lb	10.2
White lead in oil (100 lb. keg), cents per lb.	13.25
Turpentine (bbl. lots), per gal	$0.625
Putty, 100 lb. tins, cents per lb	5.50

Wire—New York

Copper wire, cents per lb	16.00
Rubber-covered wire, No. 14, per 1,000 ft.	5.30
Weatherproof wire base, cents per lb	16.5125

Paving Materials

Paving stone, granite, 5 in., f.o.b. New York—Grade 1, per thousand	$150
Wood block paving 3½, 16 lb. treatment, N. Y., per sq.yd., f.o.b.	$2.70
Paving brick 3½x8½x4, N. Y., per 1,000 in carload lots, f.o.b.	51.00
Paving brick 3x8½x4, N. Y., per 1,000 in carload lots, f.o.b.	45.00
Crushed stone, ¾-in., carload lots, N. Y., per cu.yd., delivered	3 00
Cement, Chicago consumers' net prices, without bags, f.o.b.	2.05
Gravel, ¾-in., cu.yd., delivered	2.80
Sand, cu.yd., delivered	2.00

Old Metals—New York and Chicago

Heavy copper, cents per lb	11.625
Light copper, cents per lb	10.125
Heavy yellow brass, cents per lb	7.125
Zinc, old scrap, cents per lb	3.125
Lead, cents per lb. (heavy)	4.875
Steel car axles, Chicago, net ton	$16.25
Cast iron car wheels, Chicago, gross ton	13.75
Rails (short), Chicago, gross ton	15.25
Rails (relaying), Chicago, gross ton (65 lb. and heavier)	28.50
Machine turnings, Chicago, gross ton	7.25

CHESTNUT RIDGE TRANSPORTATION COMPANY, Derry, Pa., has ordered two 21-passenger A.C.F. parlor coaches.

CLEVELAND RAILWAY, Cleveland, Ohio, has ordered 49 one-man-two-man cars from Kuhlman Car Company. The cars are to be of the Peter Witt design and each car will have two treadle doors in the center.

NEW ENGLAND TRANSPORTAJION COMPANY, a subsidiary of the New York, New Haven & Hartford Railroad, South Station, Boston, Mass., has received six Mack four-cylinder 230-in. chassis with Brown bodies.

BOSTON & MAINE RAILROAD, Boston, Mass., purchased five A.C.F. 29-passenger parlor observation coaches.

CITIZENS TRACTION COMPANY, Oil City, Pa., has ordered from the American Car & Foundry Company, ten series 602 23-passenger buses.

MONONGAHELA WEST PENN PUBLIC SERVICE COMPANY, Fairmont, W. Va., is rumored to have placed an order with The G. C. Kuhlman Car Company, Cleveland, Ohio, for ten cars.

INTERNATIONAL RAILWAY, Buffalo, N. Y., is rebuilding eighteen double-end, double-truck cars. They are to be equipped with air brake and safety car control devices, and each car is to have selective door operation.

LACKAWANNA & WYOMING VALLEY RAILROAD, Scranton, Pa., is reported to have ordered four 75,000-lb. interurban type cars from Osgood Bradley Car Company, Worcester, Mass.

TRACK AND LINE

INTERNATIONAL RAILWAY, Buffalo, N. Y., announces that track reconstruction and repaving involving an aggregate expenditure of $375,000 will be undertaken this year. The track reconstruction program covers a total distance of 4 miles divided between thirteen widely scattered sections of the city. The reconstruction work will start July 1.

LOS ANGELES RAILWAY, Los Angeles, Cal., is removing track on Vermont Avenue between Ninth and Tenth Streets preparatory to the cutting down of the grade.

READING TRANSIT COMPANY, Reading, Pa., will install a double-track branch-off and make other track changes at a total cost of approximately $6,000.

SHOPS AND BUILDINGS

TWIN CITY MOTOR BUS COMPANY, Minneapolis, Minn., has let the contract for a $50,000 addition to its Minneapolis garage to be put under way May 1. The addition will be 120x140 ft., one-story brick construction. It is being built because of need of space for new buses bought during the year.

TRADE NOTES

GRISWOLD SAFETY SIGNAL COMPANY, Minneapolis, Minn., will expand its business by erecting a one and two-story $50,000 building at Linden Avenue and Seventeenth Street, and increasing its capitalization from $250,000 to $1,000,000, and adding railroad grade crossing warning signals. The company was organized in 1923 by Frank W. Griswold and manufactures "stop" and "go" automatic signals and "slow" warning posts.

J. H. WILLIAMS & COMPANY, Buffalo, N. Y., and the HUSKY WRENCH COMPANY, Milwaukee, Wis., have joined in a working arrangement whereby they can offer a complete line of combination wrench sets. This combination is made for selling purposes only and does not effect the financial structure or management of either company.

LEW WEISENBURGER, sales representative for the Hale & Kilburn Company, whose headquarters are at Chicago, has submitted his resignation, to take effect April 30. Mr. Weisenburger's activities for the past three years have been in the electric and bus fields in the central and western territory. Prior to this he was at the Hale & Kilburn Philadelphia factory.

C. H. WILL MOTORS CORPORATION, Minneapolis, Minn., has tripled its business this spring. The output is now one $12,000 bus a day. Capitalization has just been increased from $50,000 to $750,000, the payroll has been increased from about $95,000 to $190,000 a year and the force from 60 to 125 men.

HYATT ROLLER BEARING COMPANY, Newark, N. J., has appointed as chief engineer, O. W. Young, formerly located with the western division sales office. He takes up his new duties at the company headquarters in Newark.

LEEDS, TOZZER & COMPANY, New York, N. Y., has appointed as western sales representative, Wm. McCormick, formerly Pittsburgh sales manager of the Niles Tool Works Company and the Pratt & Whitney Company.

R. D. NUTTALL COMPANY'S commercial activities will be handled by and through the parent company, the Westinghouse Electric & Manufacturing Company. All inquiries should be addressed to the nearest Westinghouse district office. J. E. Mullen, formerly assistant sales manager of the R. D. Nuttall Company, will head the new commercial set-up with offices at the Nuttall plant, McCandless Avenue at Butler Street, Pittsburgh, Pa.

ADVERTISING LITERATURE

CONSOLIDATED CAR HEATING COMPANY, Albany, N. Y., describes its new motor resistor heater, sheath wire heaters, automatic treadle-operated door control, car buzzers, visible thermostats and safety switches in an advertising folder recently issued.

PEREY MANUFACTURING COMPANY, New York, N. Y., has issued a folder entitled, "Stop the Revenue Leaks," dealing with the use of turnstiles in recording revenue.

SUPERHEATER COMPANY, New York, N. Y., has published a booklet on the word "Elesco-operation" which gives facts about Elesco superheaters for power plants and industrial use.

INTERNATIONAL HARVESTER COMPANY, Chicago, Ill., has published a booklet entitled "Automotive Equipment for Railroads."

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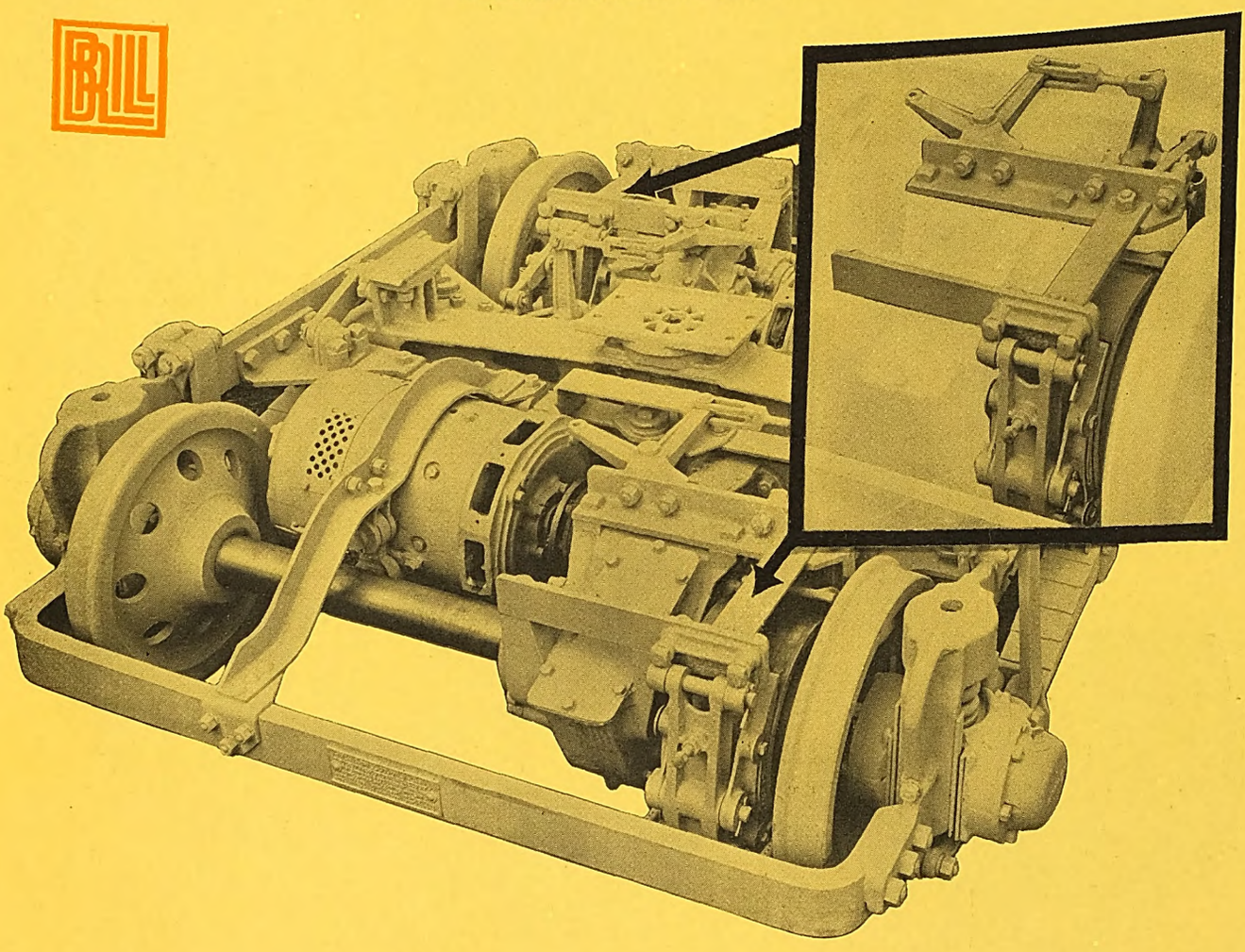

Increased Brake Efficiency

The drum brakes of the Brill No. 277 EX Trucks are the external contracting shoe-type. Their positive action and even pressure of application has been thoroughly demonstrated even after continuous use.

When heat causes the expansion of the brake drums, the clearance between shoe and drum is decreased rather than increased. Thus continuous application of this type brake does not diminish the effectiveness of its action.

The elimination of many rigging parts reduces vibration noises while inspection and replacement of brake shoes can be accomplished with practically as much ease as with the ordinary type brake.

The external contracting shoe-type drum brake was developed to meet the requirements of the most modern Brill Car—the 1928 Model.

THE J. G. BRILL COMPANY
PHILADELPHIA, PA.
AMERICAN CAR CO. ST. LOUIS MO. — G. C. KUHLMAN CAR CO. CLEVELAND, OHIO. — WASON MANF'G CO. SPRINGFIELD, MASS.

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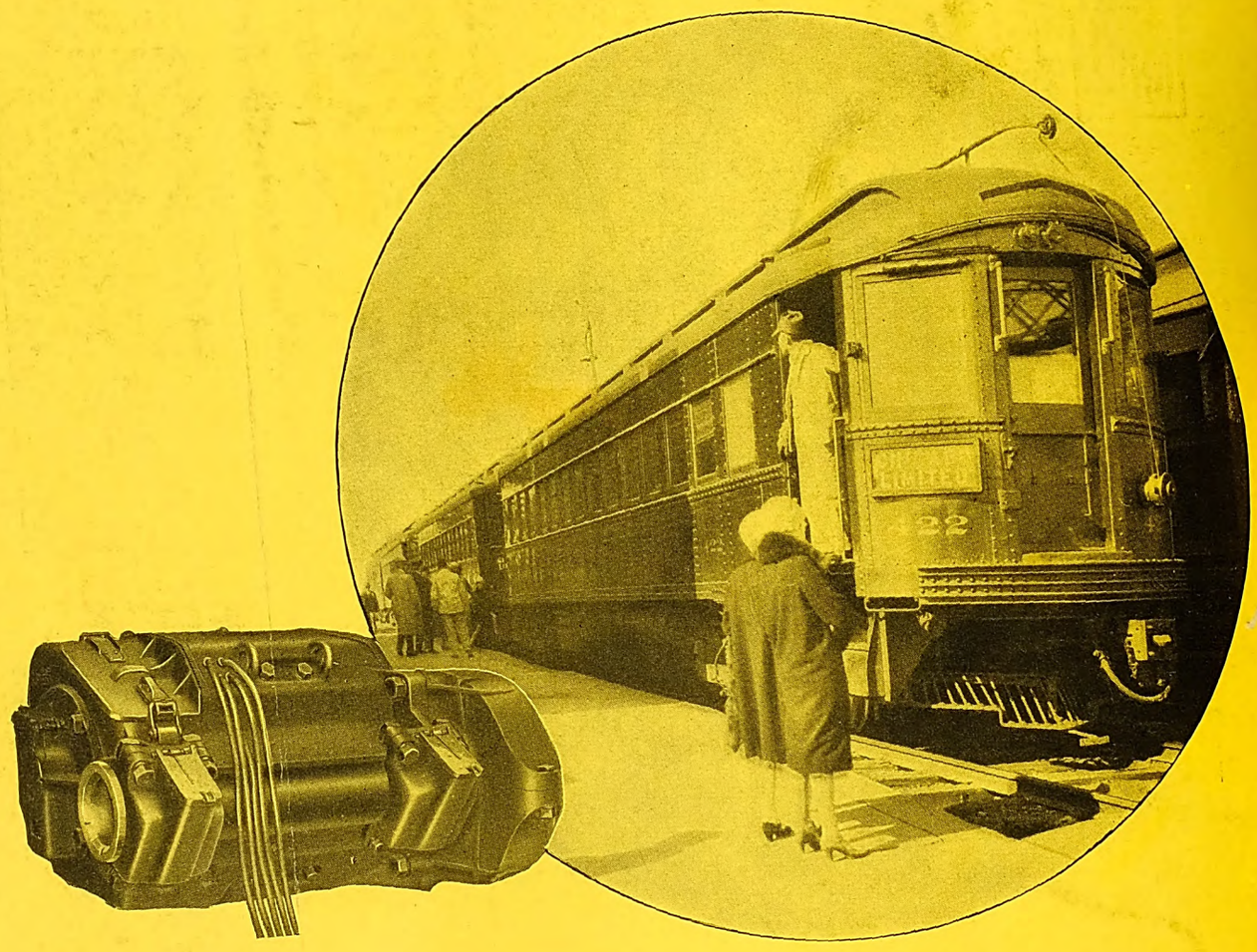

Preference born of performance

The Chicago, Aurora & Elgin Railroad equipped its speedy and luxuriously appointed new cars with GE-254 motors and Type M control. The preference for this equipment was created by the performance of the same type of motors and control on 23 previously equipped cars.

The C.A. & E. now has 150 GE-254 motors. Other railways which have given excellent service through the use of GE-254 motors include the Southern Pacific, with 96 motors; the N.Y., N.H. & H., with 71; the Milwaukee E.R. & L., with 62; the Northeastern, in England, with 44; the Wilkes-Barre & Hazelton, with 41; and many others.

If your cars are large and must run at high speeds, GE-254 motors will enable them to meet their schedules.

330-64

GENERAL ELECTRIC

GENERAL ELECTRIC COMPANY, SCHENECTADY, N. Y., SALES OFFICES IN PRINCIPAL CITIES

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ELECTRIC RAILWAY JOURNAL

McGraw-Hill Publishing Company, Inc. APRIL 28, 1928 Twenty Cents Per Copy

TIMKEN *Tapered Roller* BEARINGS

CHECK the makes of buses equipped with Timken Bearings, and the Timken chassis applications and you find universal — not far from unanimous! — agreement on Timken Bearings for hard service points.

The field of revenue-transportation, where vehicle-miles and passenger-miles and costs are matters of exact record, is exactly where the Timken showing is most impressive.

THE TIMKEN ROLLER BEARING CO.
CANTON, OHIO

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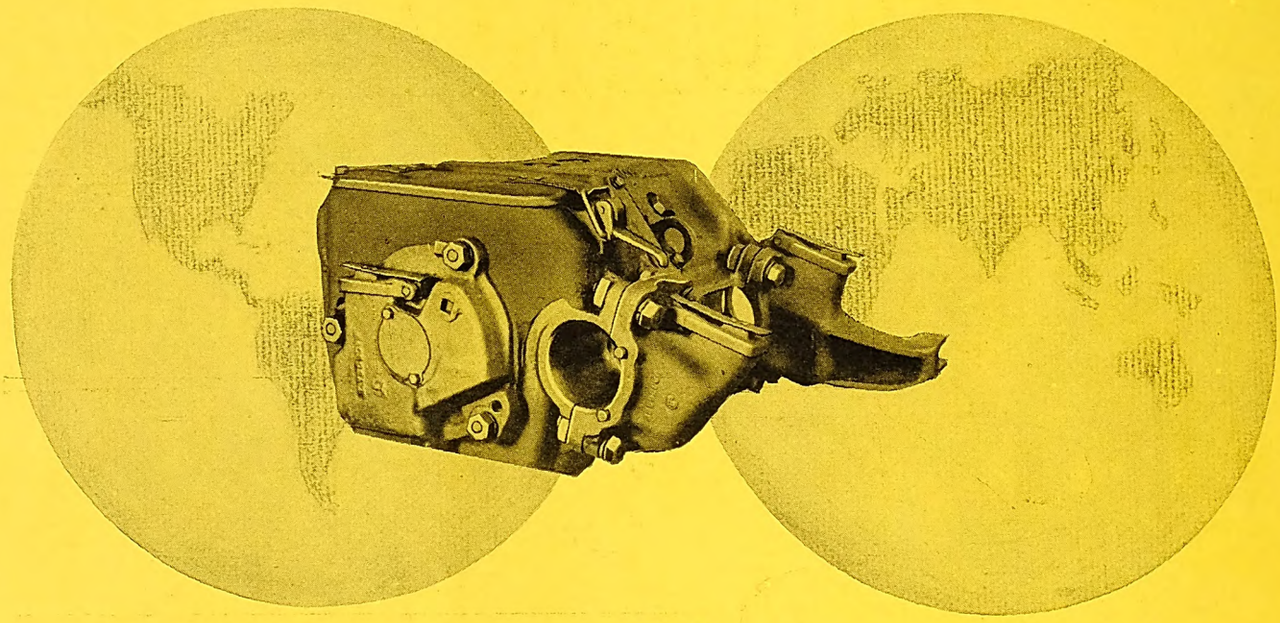
6400 Type 510 Motors ~

(35 Horsepower)



~ are useful transportation servants the world over

Where Type 510 Motors are used

United States

Alabama
Florida
Hawaii
Iowa
Illinois
Indiana
Kansas
Louisiana
Maryland
Massachusetts
Michigan
Missouri
Nebraska
New Jersey
New York
Ohio
Pennsylvania
South Carolina
Texas
Virginia
Washington
West Virginia
Wisconsin

Abroad

Canada
Costa Rica
Japan
Mexico
Newfoundland
Spain

THERE are 6400 Westinghouse Type 510, 35 horsepower motors powering more than 1600 modern electric street cars at the present time. Most of these cars are in congested city service where frequent stops and high accelerating rates are necessary

Geographically, the operation of cars equipped with this dependable motor is distributed over numerous transportation arteries in cities throughout 23 states and in 6 countries abroad. Many of its users repeatedly have ordered this motor for their new cars.

The large number in service attests to the ability of the Type 510 motor to withstand the grind of difficult city service with reliable operation, high quality of performance and the minimum cost of upkeep.

The nearest Westinghouse representative will furnish reference to railway properties using the Type 510 motor in your territory, and detailed information about its construction and performance.

Westinghouse Electric & Manufacturing Company
East Pittsburgh Pennsylvania
Sales Offices in All Principal Cities of the United States and Foreign Countries

MEMBER AMERICAN ELECTRIC RAILWAY ASSOCIATION AERA
1928

Westinghouse

X98118

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Electric Railway Journal

McGraw-Hill Publishing Co., Inc.
JAMES H. MCGRAW, *President*

Consolidation of
Street Railway Journal and
Electric Railway Review

CHARLES GORDON
Editor

Volume 71 New York, Saturday, April 28, 1928 *Number 17*

"Window Dressing" Is an Important Activity

FEW retail stores make any pretense of attracting customers without preparing attractive displays in the show windows so that the passers-by may get some idea of the goods on sale within. Where the store makes any attempt to go after a substantial class of trade the window dresser and his art become an important factor in the personnel. Much literature has been written on the subject, and courses of study have been prepared to teach the window dresser the fine points of his business.

So it should be with the transportation company. In the article on the public relations department of the Philadelphia Rapid Transit Company by J. J. Davies in this issue the public relations man is likened to the store window dresser. He is the man who calls to the attention of the riding public the advantages of using the transportation system. He is the man who makes contact with the various citizens' organizations. He is the man who prepares the advertising designed to reach the prospect. Even more, he is the man who must mollify the patron who feels that he has a grievance.

At first glance, it might be assumed from the article that a large and expensive organization is needed to conduct a public relations department properly, so that only the very largest companies can afford to maintain one. The author is emphatic in declaring that one live wire, with the right personality and a proper understanding of his work, can accomplish wonders for a small property. In these days of intensive competition with personal transportation there is no company that cannot afford to make such an expenditure, for it is likely to prove the salvation of the property.

No Grass Growing Under Their Feet

COURAGE of high order is reflected in the report of the Market Street Railway, San Francisco, for 1927. That company operates not only at a 5-cent fare, but in the face of competition from the San Francisco Municipal Railway. It is paying no dividends, to be sure, but it is making a good record and it is apparently exhausting every resource of men and management in the adoption of the most up-to-date operating ideas. To run the gamut of all the things it has done would, of course, be impossible.

Last year its expenses increased $226,764 over 1926 on account of increases in wages of employees, better maintenance of equipment and "increased costs of efforts to obtain new business." Truly that last phrase is significant. In the absence of any segregation of the items of expense there is no way to tell how much was spent in this effort to secure new business, but it is an activity of which no thought was taken by the railways only a short time ago. It may, of course, be assumed that this expenditure has more than repaid the company.

On its financial side the report is most satisfactory, everything considered. The net income was $258,158, but this was after the payment of all expenses, including interest on funded debt. The sum of $500,000 was set aside for depreciation, and another $500,000 was put aside for the bond redemption. A provision of the bond indenture infrequently encountered these days is that the bonds acquired for the sinking fund shall remain alive and continue to draw interest for the retirement of additional bonds. This, of course, imposes a mounting burden, but it was considered advisable under the present circumstances, particularly the circumstances incident to the questions about the company's maturing franchises. Certainly the company is operating against great odds, but they appear only to have increased the fortitude of the management. In short, the annual report proves that the responsible operating officials of the company are not permitting the grass to grow under their feet.

Lackawanna Electrification Significant

DECISION of the Lackawanna Railroad to begin at once the electrification of its main commuting lines leading to New York City is doubly significant. In the first place the project involves 78 route miles, making it one of the longest suburban electrifications in the United States. Moreover, this large undertaking has been made possible at the present time by the willingness of the public to pay an increased fare for improved service.

The plan includes the entire Morris & Essex division from Hoboken to Dover, as well as the Passaic & Delaware and the Montclair branches, with a total of 173 miles of track. It is planned to operate all suburban service on these lines with multiple-unit cars. Through passenger service and all freight service will continue to use steam motive power. The Boonton branch, which carries the greater part of the Lackawanna's freight, will not be electrified.

Marked improvement in the suburban passenger service will be made possible by electrification. At present the mile-long tunnel under Bergen Hill, just outside the Hoboken Terminal, seriously hampers operation. On account of the poor visibility with steam operation no train is allowed to enter the tunnel until the preceding train on the same track has cleared the far end. This gives a minimum headway per track of about five minutes, or a combined headway of slightly under two minutes on the three tracks which are used in the rush direction. Present schedules provide sixteen trains in the maximum half-hour. This is believed to be the largest number which can be operated with steam motive power. With electricity, however, the tunnel can be divided into shorter blocks and the headway materially improved.

Other important advantages of electrification are the elimination of the smoke nuisance in the tunnel and in the many residential communities along the line, saving of labor on long trains which now use two locomotives,

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and the ability to operate single-car or two-car trains with a small crew in non-rush hours instead of the present trains consisting of a locomotive and three or more cars with a larger crew.

Electrification of the Lackawanna has been in prospect for some years. Few local passenger locomotives have been bought in the past 25 years. The latest lot of cars was built with lower roofs to provide space for pantographs. But the tremendous cost of the undertaking, which is now estimated at $14,000,000, caused the company to hesitate. Recently, however, a committee composed of representatives of civic bodies in many communities along the line agreed to co-operate with the railroad in securing an increase in commutation fares. In doing so it took the unusual attitude that, in its importance to the communities, the project was so outstanding those whom they represented would be willing to pay increased commutation fares in order to secure the advantages of such improvements in transportation facilities. Under these circumstances the railroad decided to go ahead with the project.

It is expected that the increase in fare will average about 2 cents per trip. The company states that this will not become effective until the electrification is completed, which will take about two years. For their willingness thus to co-operate in the interest of improved service both the railroad and the communities are to be congratulated.

Shifts in Employment Affect Railway Revenues

LABOR-SAVING equipment is being eagerly sought in all branches of industry. Development in this direction, especially during this decade, is a logical outcome of the present age of machinery and electrical distribution of power. While this trend is in the interest of national economy and therefore desirable, it must not be forgotten that it is having a noticeable effect on the employment situation.

The extent of this effect is shown in a report of the U. S. Bureau of Labor Statistics, submitted through the Secretary of Labor on March 24 to the U. S. Senate. This report, with accompanying documents, is printed in full in the *Monthly Labor Review* for April, 1928, just issued. Commissioner Stewart gives 1,874,050 as the number of unemployed in January, 1928, as compared with a total of 25,222,742 wage and salary earners in 1925, when there was no noticeable unemployment. The 1928 figures, he explains, do not include persons operating their own businesses or professions. He also points out that this group of unemployed may be subdivided into those temporarily not working because of plant suspensions, and those displaced by changes in industrial and commercial methods. The former are reasonably assured that when their business resumes, they will be restored to employment. In the second group, the job is gone, never to return. The man must change his occupation and seek new contacts. The commissioner thinks it reasonable to estimate that one-half of the present unemployment group belongs to the latter class.

An interesting phase of the employment situation was pointed out by Julius Klein, director of the Bureau of Foreign and Domestic Commerce, Department of Commerce, in an article published in the April 7 issue of this paper. Dr. Klein called attention to employment increases in the so-called "service" in non-productive industries. That tendency, in a measure, offsets the displacement of labor by machinery in production. Despite this alleviation of what would otherwise prove a very serious unemployment situation, changes in occupation result in major shifts of population from some employment centers, particularly in smaller communities.

This shifting of employment is being felt seriously by some electric railways. Persons who have made a study of the subject point to these basic industrial upheavals as the explanation for traffic losses that usually have been attributed entirely to automotive competition. The facts in any given territory may be ascertained readily. There is no question but that they are worthy of close study and analysis by transportation men.

Voluntary Regulation Will Be Least Restrictive

WHILE the preliminaries among those who favor regulation of interstate buses were marked by a spirit of give and take which promised a united front on the Parker bill before the Congressional committee, a seriously disturbing situation arose unexpectedly. This was due to the disposition of the N.A.C.C. to insist on conditions of administration more or less precise that tended to becloud the main issue.

It is right that each party at interest should stick by its guns, but after agreement on the essentials it does seem that over-emphasis was placed on the need for trying in advance to perfect the machinery of regulation. This does not mean that ends should be left dangling, but the history of regulatory movements makes it plain that it is quite impossible to anticipate all the *minutiae* of the application of a regulatory statute. In the light of that fact, some of the hypothetical cases advanced as criteria of what might be expected to be encountered in the application of the law seemed strained—to put it mildly. Of course, manufacturers are a party at interest, but it would seem to be extremely poor taste, where the operators appear to be ready for regulation, for the manufacturer to attempt to dictate provisions under which the user of his product is to be regulated. This is the view voiced by one manufacturer at the hearing.

Since the general trend of the discussion of the measure at Washington was set forth in the account of the hearing in ELECTRIC RAILWAY JOURNAL for April 21, the Interstate Commerce Commission has made its full report to Congress on the matter. This fortifies the opinion of Mr. Flynn, the commission's special examiner, in regard to the principles which should govern interstate regulation of buses, principles the Parker bill followed closely.

If the attempt to stabilize interstate bus operation through regulation should fail at this session of Congress there seems ample reason to attribute the cause largely to this unexpected last-minute disposition to try to make a regulatory law perfect in all of its details at its inception. Certainly the desirability of regulation has been proved. It is unthinkable that present conditions can be permitted to exist much longer. If regulation comes to correct abuses instead of merely to stabilize an industry—the consequences to both the manufacturer and operator may be much more dire than those conjured up by the opponents of the impending regulatory (not restrictive) measure.

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Adult Education of Growing Importance

WHILE his remarks were directed primarily at educational methods in the college of today Doctor Hibben, president of Princeton University, in a recent address gave expression to the ideals and purposes which also motivate adult education in industry. Since the turn of the century, when only desultory and spasmodic efforts were made toward an improved personnel, to the present-day opportunities for advancement that are offered to their employees by many utility companies, much has been accomplished for the mental improvement of the man in the ranks.

Unfortunately, that millennium is far distant when instructors can put the idea into the man in industry that study is not so much an instrument for personal improvement as it is an inquiry into the nature of things themselves. However, for the present and the immediate future, if the educational opportunities offered to the employee encourage initiative and arouse in him the desire to make education a continuing process, whether he remains in the utility field or goes into the building of houses or the selling of bonds, then they have been worth while. If he has learned the value of capitalizing on his leisure hours, then the lectures and courses of study under the sponsorship of his company will not have been in vain.

Just as one college president puts it—"we do not nowadays attempt to give an education—we afford opportunities to our students to obtain an education by their own efforts," so education endorsed by utility companies does not mean the absorption of ready-made knowledge but the stimulation of interest in knowledge so that independent study will be undertaken. In the railway business that man who refuses to grow will in the not very distant future find himself off the roster of a progressive company, for only the fittest will survive.

Taxes by Some Other Name

PERSONS who advocate municipal ownership and operation of public utilities are not altogether unlike enthusiasts for "perpetual motion" machines. They seem to think there is some magic in municipal ownership whereby the people get something for nothing. For example, South River, N. J., recently received praise from United States Senator George W. Norris as a "taxless town." Freedom from taxation was made possible, so it was claimed, by the profits from the municipal electric generating plant, from which all expenses of the muncipality have been paid for the past three years.

If the story stopped there, one might well envy the happy inhabitants of South River. But—there is a combined state, county and school tax of $3.65 per $100 in this "taxless town." This rate is considerably higher than that prevailing in numerous other communities in the same state which make no pretense of being taxless. With roads, bridges, institutions and schools provided for principally by the state, county and school district taxes, the town's municipal expenses naturally are small, and the profits of the electric plant have been sufficient to cover them.

To make this profit, however, it has been necessary for the town to charge more for commercial power than do the near-by privately owned companies. Domestic lighting, which probably does not represent more than one-fifth of the output of the plant, is at the same rate as that charged by the private companies.

Thus the net result of the municipal ownership and operation of the electric plant in "taxless" South River seems to be that the customers using four-fifths the output of the plant have to pay more for electricity, and everybody pays more taxes than in neighboring communities.

Political Procrastination at Cleveland

EVER since the passage of the Tayler service-at-cost measure in Cleveland in 1909, major moves affecting the Cleveland Railway under the terms of that grant have been followed with great interest by the electric railway industry. This is only natural, since the grant was considered so sound basically that the principle back of it has been applied in many other places. In consequence, the changes made in the grant in 1926 were widely heralded. They were, of course, sound. The need has again arisen for doing something, something heroic, perhaps. Among matters to be adjusted are questions of fares to the suburbs and of bus operation.

No attempt ever was made to extend the service-at-cost provision to the suburbs because until a few years ago the amount of suburban service was comparatively insignificant. When Cleveland had 3-cent fares years ago, the Cleveland Railway and the City Council signed up the three major suburbs—Lakewood, Cleveland Heights and East Cleveland—for long-time 5-cent franchises. When rising costs put the Cleveland fare above 5 cents, the company and the Council succeeded in having the suburbs agree to pay the rate of fare, in force in Cleveland, but this arrangement still permitted suburbanites to ride for less than cost. That, of course, is absurd. It is equally absurd for the Council to dictate to the company a policy of bus operation that has resulted in a loss of $370,578 in 1927 and a total loss of $861,470 since the installation of bus service 29 months ago. Incidentally, 21 out of 35 car lines are unprofitable at the present time, since many of the car routings are archaic. But the company must perforce continue to let Wade Park cars perambulate over the east end, Clifton Boulevard cars amble alongside a bus route, and the East 105th Street cars meander along a narrow street parked with vehicles. Moreover, if the city continues indefinitely to regulate and prescribe service as it did nearly twenty years ago without first restricting the real dictator of service, traffic congestion, it will receive a decreasingly effective service at a constantly increasing cost.

These are the most obvious things that call for correction. Recent discussions of them have not been without attendant hysteria over the outlook for the future, *Finance and Industry* even raising the question, "Is the Tayler franchise a failure?" and *Greater Cleveland,* devoting a whole issue to transit, heads its review, "Council Must Act on Transit Problem." There, it seems, is the answer. The Tayler franchise is a human document subject to political procrastination. That seems to be the point. The Cleveland franchise has worked since 1909, not always with the celerity that might be desired, but it has worked. The idea on which it was founded is just as sound today as it was the day the grant was drawn. That questions arise under it which at the time appear serious is not a fault of the grant. The fault is with the agency that is indifferent. That agency in this instance is the Council. The company, Railway Commissioner Ballou and the committee which considered suburban fares appear to be agreed upon the course of action that should be followed. On this and other matters the Council needs to be spurred into activity.

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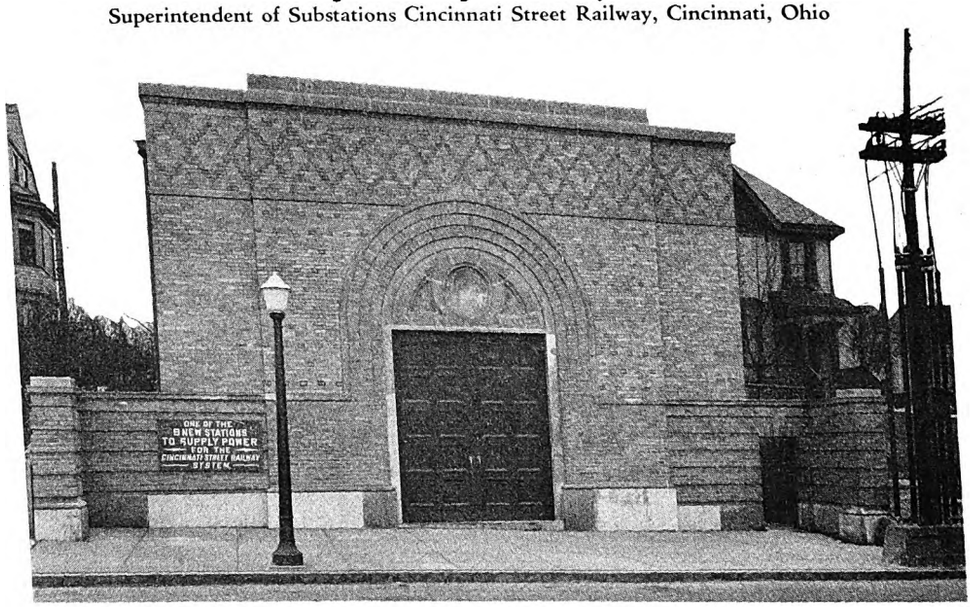
Cincinnati Installs

Full-Automatic Supervisory-Controlled Distribution System

By *Harley L. Swift*
Superintendent of Substations Cincinnati Street Railway, Cincinnati, Ohio



Colerain Avenue substation, one of the nine new 60-cycle stations built in Cincinnati
The architectural treatment of each building is adapted to its surroundings. At the right is shown the standard method of bringing feeder cables out of the building. The feeder rack is not completed.

Complete redesign and rehabilitation of power distribution facilities will provide most extensive supervisory controlled automatic system ever installed on a city property. Nineteen automatic stations give efficient power distribution under supervision of central dispatcher

BY JULY, 1928, the Cincinnati Street Railway expects to have completed the rehabilitation of its entire power distribution system. The rehabilitated facilities will include nineteen full-automatic, 60-cycle, synchronous-converter substations, with supervisory control from a central load-dispatching office adjacent to the Walnut substation. This is the most extensive supervisory controlled automatic installation ever undertaken on a city distribution system and includes many novel features to provide flexibility and to insure safety and freedom from service interruptions. When completed the railway expects its distribution installation to be the most reliable and economical that the development of the art will permit.

Eleven new substation buildings have been erected, three buildings have been completely remodeled into substations and five present substation buildings have been partly remodeled. As outlined in the Jan. 21 issue of ELECTRIC RAILWAY JOURNAL, the rehabilitation program includes the sale of the Pendleton steam power plant, abandonment of former 25-cycle substations and purchase of all power at 13,200 volts from the Union Gas & Electric Company.

Locations of the new, rehabilitated and abandoned stations are shown in an accompanying map of the system. The three stations in the congested area will each have two 1,500-kva. converters; the intermediate ring of stations, ten in number, will each have one 1,500-kva. converter. Beyond these is an outer ring of stations having one 1,000-kva. converter each, and a 200-kva. unit on the Milford interurban line. The total machine capacity of the new system will be 29,200 kw. Bearing in mind the proposed Cincinnati rapid transit system which has been under discussion for many years and which is partly completed, and the future growth of the city, provision for increased power has been made by allowing space for an additional unit in each of six of the stations—Walnut, Kenton, Brighton, Colerain, Mitchell and Westwood.

NEW SYSTEM USES 60 CYCLES INSTEAD OF 25

Under the old system 25-cycle power was generated at Pendleton power house, a steam-turbine plant of about 20,000-kw. capacity. This power was distributed at 6,600 volts although all equipment was adaptable for 13,200 volts to five synchronous converter substations—East

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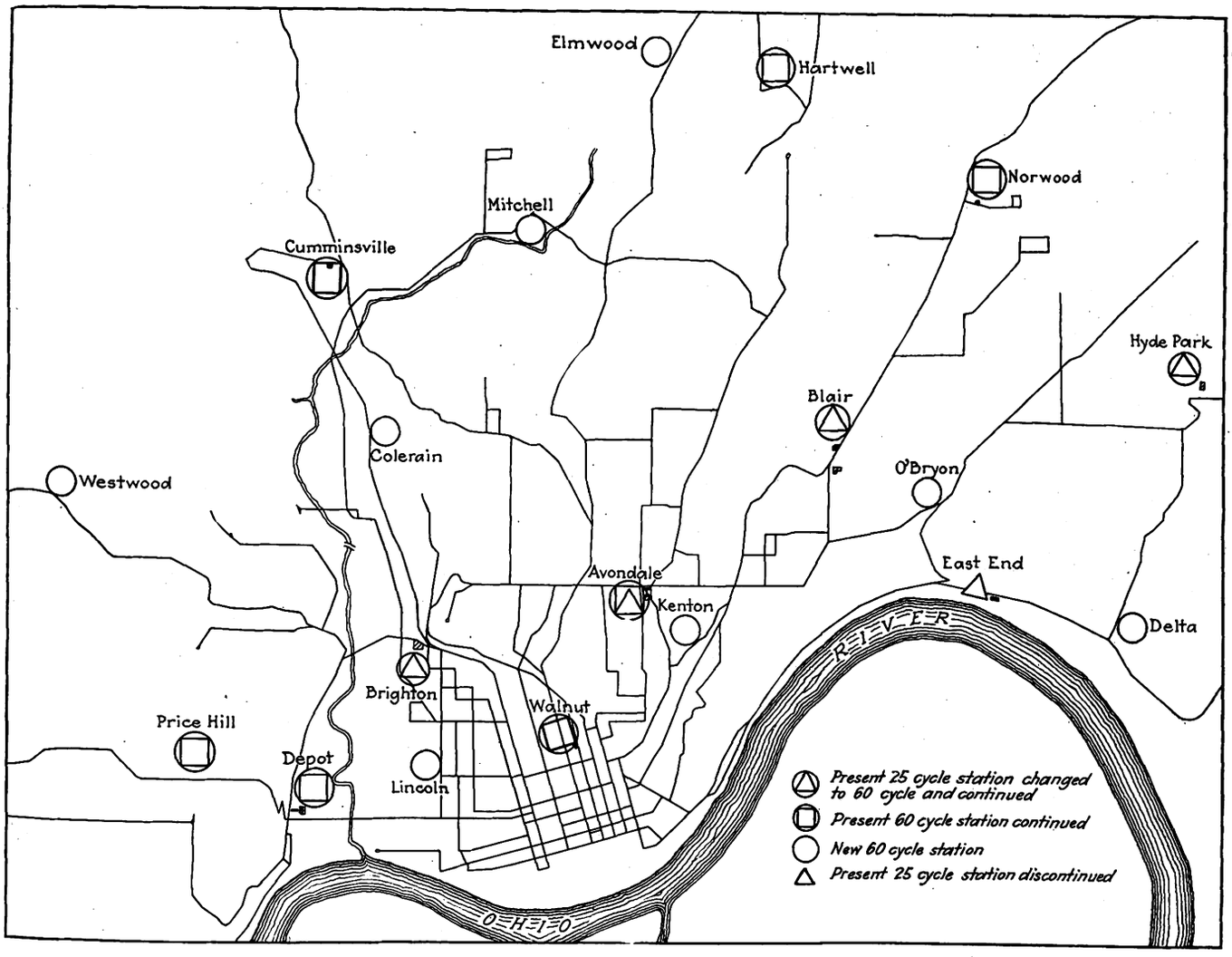
End, Hyde Park, Blair, Avondale and Brighton—and converted to 600 volts direct current. Power at 13,200 volts, 60 cycles, was purchased from the Union Gas & Electric Company at seven synchronous converter substations—Price Hill, Hartwell, Norwood, Walnut, Cumminsville, Depot and Miami—the three first named being

The outstanding feature of the supervisory control system being installed is the full knowledge the dispatcher has at all times of every important function in each station. The stations are completely under his control so that he can transfer loads from one station to another as load limitations or economy dictate, or should



New power distribution system of the Cincinnati Street Railway

All stations are full-automatic with supervisory control from a dispatcher's office adjacent to Walnut station. The location and capacity of each station was determined through the use of spot maps showing car distribution in peak periods.

full-automatic stations. There was a 1,500-kw., 60-cycle, synchronous converter at Avondale using purchased power, and a booster set at Brighton to help out during peak loads. The total substation capacity of the system was about 30,000 kw.

No Change in Total Capacity of Substations Contemplated

With the new system the total capacity is practically the same as with the old, the difference being in number, capacity and location of the stations. These are now relatively close together, the average distance between them being about 1 mile. The location and capacity of each station was determined from spot maps showing car distribution throughout the city during peak loads, and a knowledge of energy consumption of cars when loaded and on grades. The new station locations will give far better voltage and lower line losses throughout the system.

the fire chief order lines cut out in a fire area the dispatcher can do so instantly.

Should anything happen to the supervisory control system for any station, group of stations, or all of them, those affected will at once function automatically, except that any device locked out by the dispatcher prior to the disruption will remain locked out until released by a visit to the station.

An average of $2\frac{1}{2}$ seconds is required to establish a control circuit in the supervisory system. The actual operation of the devices and check-back indications is instantaneous, so that the time required to complete any cycle is determined by the speed with which the dispatcher can push the control buttons. To provide a permanent record of loads and to afford a means for analysis of the opportunity for economy, the bus voltage for each station and the ampere load on each converter on the system are recorded in the dispatcher's office by indicating and recording meters on each station panel.

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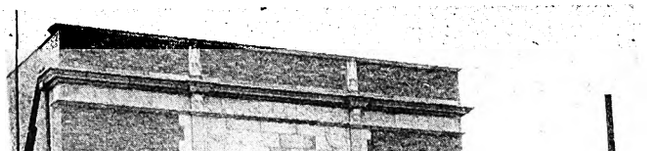


Elmwood substation, which will normally operate as one of three grounded-return stations, but is so located that in an emergency it can feed an ungrounded return or double trolley division

For the circuits of the supervisory control system, four pairs of wires run from each of the nineteen stations directly to the local dispatcher's board, which has a panel for each substation. Two of the four pairs of wires from each station are for remote metering and a private telephone system. By means of buttons on each control panel the dispatcher may at will (1) start or stop each converter; (2) release each converter to automatic operation; (3) open or close each incoming line oil circuit breaker; (4) open or close each d.c. feeder; (5) release each d.c. feeder to automatic operation.

Through red, white and green lights the dispatcher has continuous indication of the following: (1) Whether each converter is running or stopped; (2) whether load-limiting resistor contactors are open or closed; (3) sequence of starting for converters in double unit stations; (4) availability for service of each incoming a.c. power line; (5) position of each incoming line circuit breaker; (6) position of each d.c. feeder breaker; (7) whether the station control battery is being charged; (8) that the station lockout circuit has shut down the station; (9) whether the station door is locked or unlocked.

The dispatcher can start any station independently of its automatic functioning by turning a key and pulling a button on the panel controlling it. Within five seconds he will have completed a circuit between his board and the relay to be operated at the station. A yellow light will appear on his board, which indicates to him that the circuit has been completed correctly right up to the relay at the station. Having received this check light he can close the relay through a second button, and a red light indicates that the connection has been made correctly.

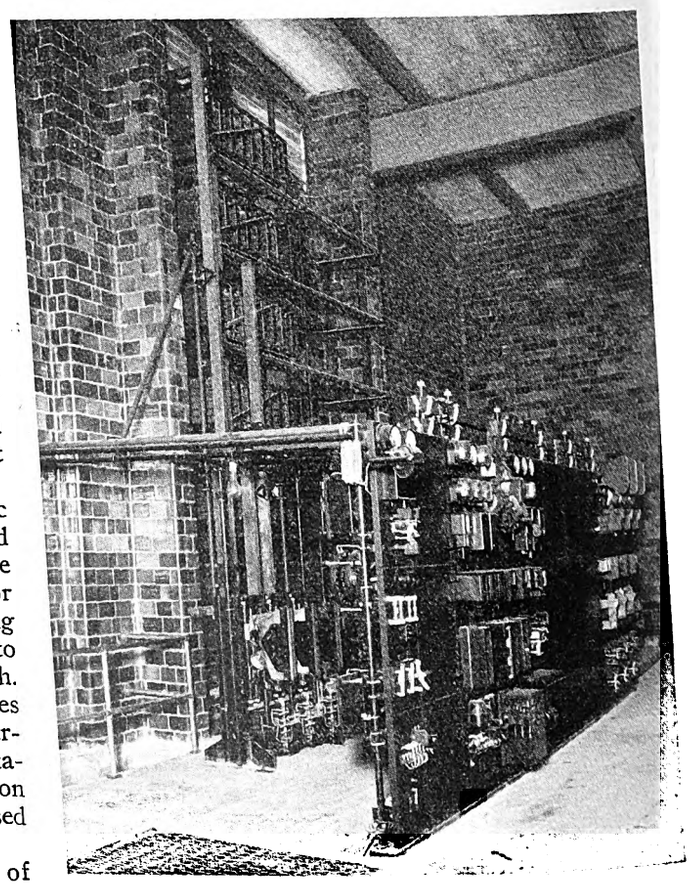
If, while the dispatcher is engaged, some automatic device in any substation operates, his attention is called to it audibly by the ringing of a bell and visually by the appearance of a white light at the top of the panel for that station. At the same time the signal light indicating the device on the panel changes in color from red to green or vice versa, and a white light appears beneath. The white lights go out when the dispatcher acknowledges the signal by pushing a "clearing button" on that particular panel. Should several devices function simultaneously the signals are "stored" and sent in succession as the devices function. Thus the dispatcher is advised of every change occurring in each substation.

After a study of the present and future possibilities of the territory surrounding each station, a building was designed whose exterior not only would harmonize with, but would be a distinct credit to, the locality. No two of the buildings are alike. The grounds about the stations will be carefully and beautifully landscaped.

Since many of the buildings are in residential districts, attention to the matter of eliminating objectionable features did not stop with attractive exterior architecture. Every effort was made to reduce noise and to make the stations as nearly soundproof as possible. The converters are mounted on 3 in. of Armstrong machinery isolation cork. Except for the main door and an emergency rear exit, there are no openings in the building above the ground line. The inside faces of the walls are 8-in. Insul glazed tile.

Ventilation System Embodies Latest Recommendations and Developments

Particular attention was given to the ventilation of these buildings. The latest A.E.R.A. and other recommendations and developments are to be found embodied in them. All air enters the building below the floor line, and passes up through floor gratings at each end of the converters, under the transformers, and under the load-shifting resistor bank. A chimney leading from each converter pit through the roof conducts to the outside the hot air discharged downward by the converter. A 66-in. Robertson ventilator is mounted on the roof above each converter for the hot air discharged upward. There is an opening to the outside atmosphere of 400 sq.ft. in the half cellar under the converter side of the building. Another opening of 40 sq.ft. area from the outside feeds cool air to the grating under the transformers, and two or three 30-in. ventilators, depending on whether the station has one or two units, are placed directly over the transformers. This arrangement allows



Interior view of station showing load-shifting resistor mounting, floor grating and side wall louver near ceiling for ventilation

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cool air to enter at the transformer base and to flow upward along the tubular radiator pipes, cooling them and passing out through the roof ventilator. The load-shifting resistors are mounted on the wall between two pilasters directly over a floor grating, the cool air coming up from the half basement, passing through the resistor and discharging outdoors through movable copper louvers in the wall above the resistors. The mean height of the buildings above the floor is 23 ft., which is not only an aid to ventilation but is a help in deadening the operating noises.

To facilitate maintenance, the new buildings have been designed and the old ones remodeled so that the arrangement of equipment in each station will be as nearly alike as is possible. Typical sections through single and double unit stations are shown in accompanying illustrations. All apparatus is located indoors in one large room on one floor, with the exception of the control and supervisory storage battery, the air compressor and the negative bus structure, which are in the basement.

The incoming a.c. power lines come through underground ducts, and the outgoing d.c. feeders go through a tunnel to the curb line and are brought out to overhead feeders through vertical pipes mounted around the feeder pole. Double-unit stations have two incoming 13,200-volt, 60-cycle, a.c. power lines, and single units one incoming line. The Union Gas & Electric Company delivers power and maintains the lines as far as the pothead in the cell structure, which also houses disconnecting switches, potential, current and control transformers and the main oil circuit breakers. The lead-covered cable from the cell structure to the transformer enters the latter through side-type oil-filled potheads, so that no high voltage conductors are exposed.

High-tension bus structures are of "Deceleco," a fibrous compound of gypsum. The structures were made and installed by Deceleco, Inc., Wayne, Mich.

Transformers are of the outdoor, tubular-radiator, oil-cooled, three-phase, high-reactance core type with interleaved disk windings. As previously mentioned, however, they are installed inside the station buildings. Primary taps may be changed by an operating lever extending through the cap plate. Low voltage leads are brought out the side through weatherproof bushings.

The 1,000-kw. and 1,500-kw. synchronous converters have speeds of 900 r.p.m. and 720 r.p.m. respectively. They are capable of 150 per cent load for two hours and 200 per cent load momentarily. They may be operated without undue heating either as full compound machines or as full shunt machines or anywhere between, by adjustment of the series field.

Interior of Colerain substation, showing typical arrangement of station equipment, provision for additional unit and "Deceleco" bus cell construction. The transformer is located behind the switchboard at the right

High-speed breakers in the negative sides of each converter open in 0.007 second. This precludes a high value of current before the converter is cut off the bus. Aluminum bar is used for the negative bus and for interconnections between the load-shifting resistor units and the contactor groups. A 30 per cent saving in cost over copper despite use of additional bars, and the light weight of the aluminum, were factors determining its use.

Automatic reclosing circuit breakers have been installed on each of the 87 feeder circuits. These breakers open on short circuit or severe overload. When this happens, relays immediately feel out the circuit, and so long as the trouble remains on the line the breakers stay open. As soon as the trouble is cleared these relays cause the breakers to reclose.

Due to the double trolley system used in Cincinnati, the Elmwood station presents an interesting problem;

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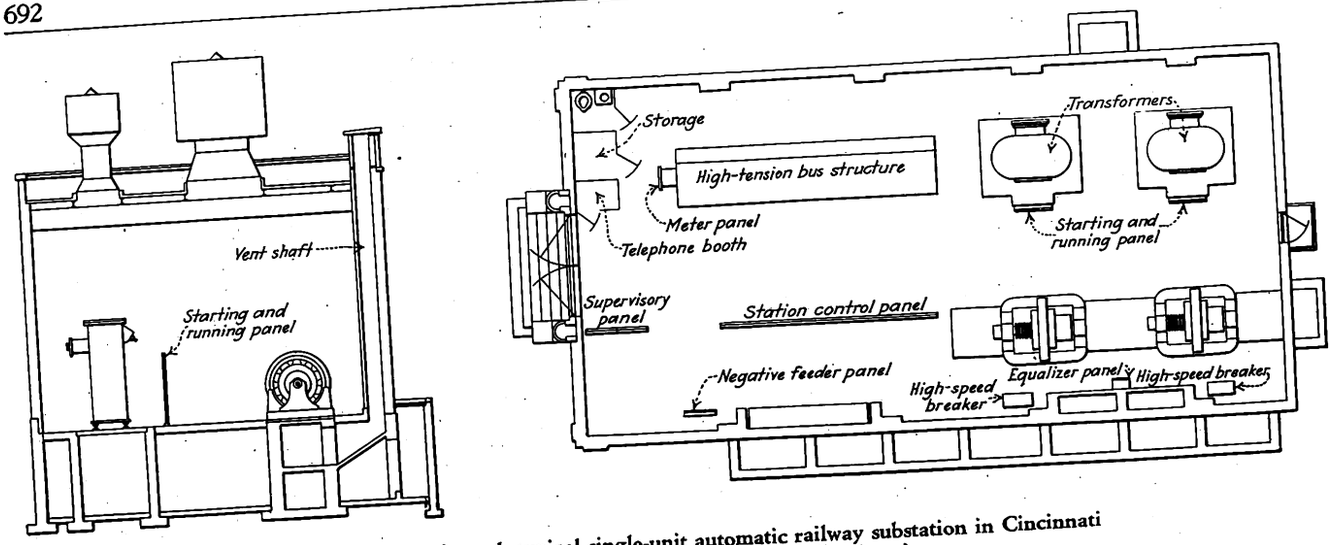


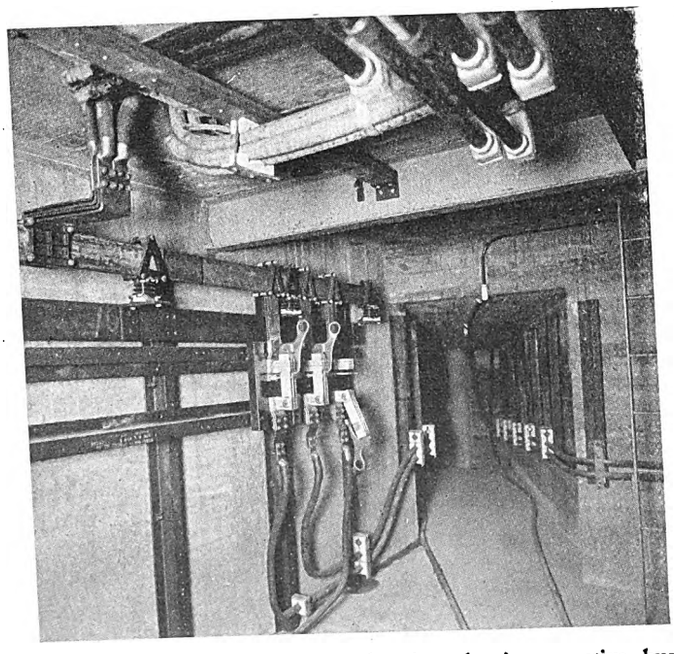
At left—Section through typical single-unit automatic railway substation in Cincinnati
At right—Floor plan of typical two-unit substation

normally it is one of three stations with grounded return, but it is so located that in an emergency it may be called upon to feed an ungrounded return, or double trolley division. The load dispatcher, through the supervisory system, can make this change-over readily, as an interlocking arrangement makes it impossible to throw in the ungrounded breakers while the station is operating on the single trolley with grounded return and vice versa. The station functions automatically on either return.

Flood District Represents Special Problem

The Lincoln station, located in the flood district, has been constructed as a veritable concrete bathtub. The entire foundation is waterproofed with a ¾-in. Carey fibrous asphaltic preparation and lead sheathed cables are used instead of varnished cambric flameproof cable.

Substation buildings are normally lighted with 110 volts a.c. from the control transformer, but there is an emergency 600-volt d.c. series lighting circuit so that for cleaning and inspection the high-tension circuits can be disconnected at the incoming pothead. The storage battery feeds one ceiling lamp near the door and two extension cord outlet plugs, one at the end of the switchboard and one in the basement.



Basement view of Cincinnati substation showing negative bus structure and method of carrying feeder lines to street

An inclosed booth houses a telephone on a direct line over the supervisory cable to the dispatcher's office. Through it communication may be had with any other station. A Bell telephone also is part of the equipment of every station. There is a tool storage room and toilet in each building.

Landis & Gyr Maxigraph meter and panel

The Union Gas & Electric Company has installed the most recent type of metering equipment. Two outstanding features of these instruments are: (1) Power can be off 50 consecutive hours without affecting the accuracy of the meter; and (2) the silver stylus and impregnated paper chart not only do away with ink but give a clearer, more pronounced and more accurate reading than was heretofore available. One of the accompanying figures shows this Landis & Gyr meter.

The Colerain station was successfully placed in service March 12, Westwood April 5 and Hyde Park April 25. Lincoln, Depot, Delta and Kenton Stations will go into service early in May. Present schedules call for completion of the entire system by July 1.

All electrical equipment was furnished by the General Electric Company. Practically all of the 60-cycle equipment already in service has been utilized in the new system. The Collier Construction Company of Cleveland installed the electrical apparatus in ten of the new stations, while the Cincinnati Street Railway's forces handled the work at the remaining nine stations, five of which maintained partial operation during the changes.

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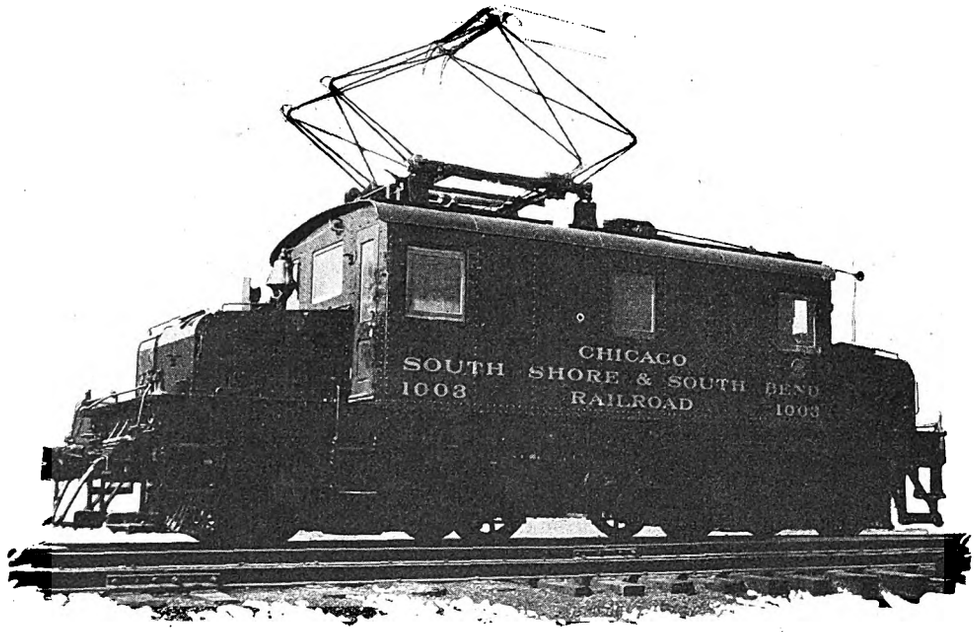

One of the 80-ton locomotives

South Shore Line Builds

Attractive Freight Service

New stations, larger loading platforms and double-end sidings speed the service. Overnight delivery of l.c.l. freight popular with shippers

CENTRALIZED shipping and receiving facilities for the growing freight business of the Chicago, South Shore & South Bend Railroad, are provided by a freight merchandise station opened in South Bend, Ind., last month. The station embodies many new features in design and construction.

The over-all ground dimensions of the building are 28x90 ft., including a 10 ft. eave overhang on each side of the loading platform to protect against storms. The structure is built of Stefco steel with fireproof creosoted pine floor and corrugated steel apron reaching to the ground around the entire building. The office section has, in addition to the headquarters for the freight agent, a heated room for storage of perishable goods in cold weather and a room for valuables. The office part of the building is also constructed of Stefco steel, lined with Celotex sheathing and given a pleasing, yet practical, interior appearance.

The loading platform is inclosable with vertically sliding doors, designed and built in the Michigan City shops of the South Shore line. Eighteen of these doors are provided, making it possible to expose the entire platform. At one end of the platform is a built-in loading scale with concrete foundation.

Freight business of the railway, since the reorganization, has already shown a remarkable growth under an active corps of traffic experts who were put to work on the freight problems of shippers in the territory. Reference to the building up of this business was made in ELECTRIC RAILWAY JOURNAL for Nov. 5, 1927, page 852, and Nov. 12, page 901. Extensive improvements were made in the facilities for handling freight, among them

The South Shore freight station at Gary, Ind.

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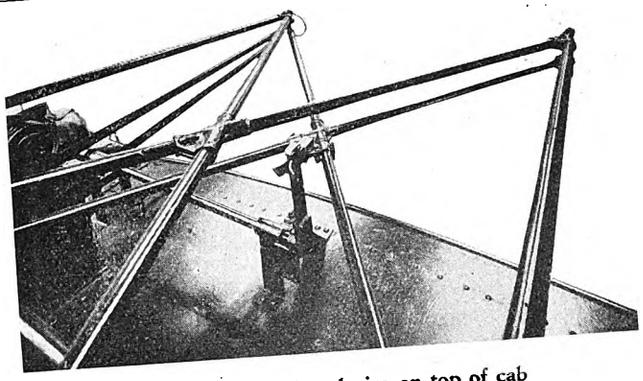


Pantograph locking device on top of cab

being the remodeling and building of larger station platforms and construction of the South Bend freight station.

In addition to rehabilitating the road from end to end, passing tracks already built were lengthened and additional ones were constructed. Portions of the line were double-tracked in order to improve the handling of traffic, which was increasing in volume from month to month. New interchanges were constructed, with the Belt Railway Company of Chicago at Hegewisch, Ill., and the Wabash Railway at Gary, Ind. In addition, the interchange track maintained with the Nickel Plate Road at Michigan City, Ind., was doubled in capacity.

The present South Shore Line management realized at the outset that the establishment of working arrangements with other lines was imperative. Heretofore rates were in effect with only a few lines, and many confusing restrictions existed in tariffs. The South Shore Line has gone steadily ahead in this important branch of traffic work. Rates have been established with a large number of lines on a competitive basis and today it is in a position to give shippers and receivers of freight a service and rates in line with those of other roads.

Four receiving stations for freight were established at vantage points in Chicago and an overnight delivery policy was inaugurated. Freight taken to the receiving stations before late afternoon is transported to stations on the line ready for pick-up the next morning.

The South Shore Line has an advantage over some other electric railroads in that standard freight cars can be handled over the entire line from Kensington, Ill., to South Bend, Ind. Through the activity of its freight solicitors and traffic agents, interchange and switching facilities have been established with several of the nearby steam lines and other arrangements are pending.

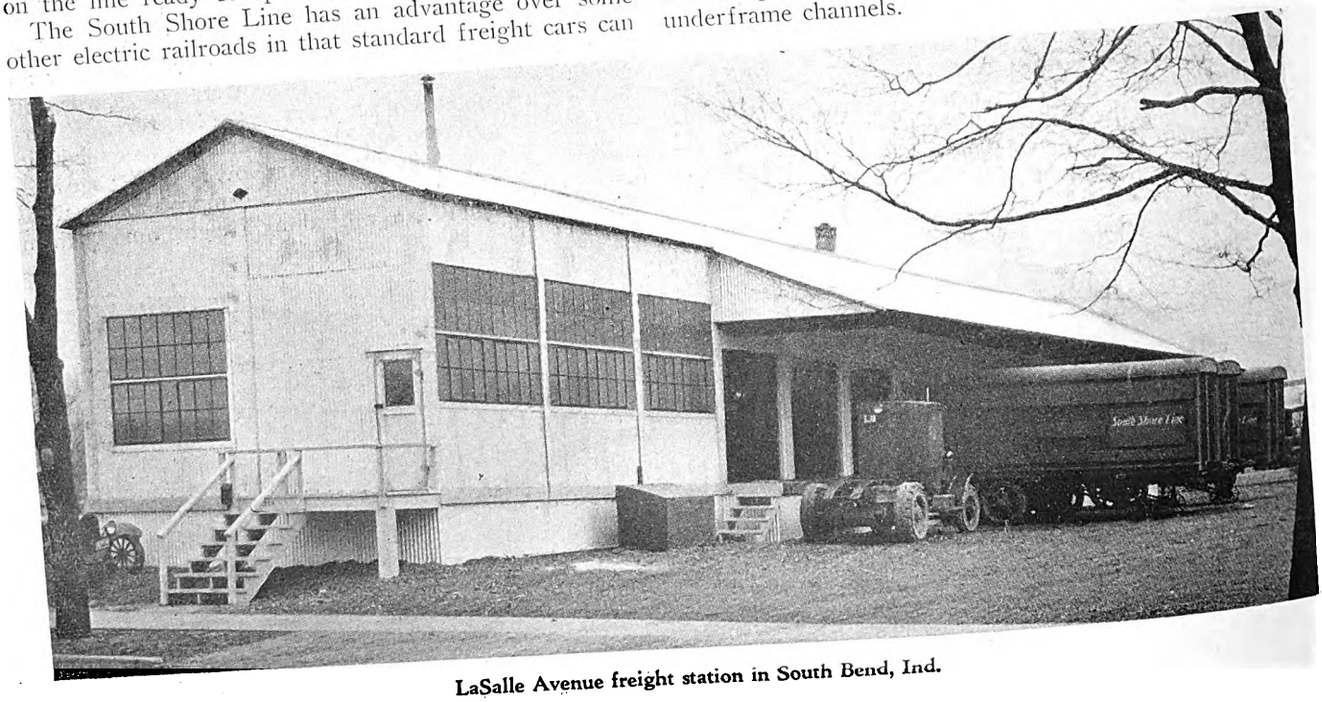
Through rates have also been established with several steam lines and other tariffs are being worked out. Private switching tracks have been built for several new industries and others have been laid for some of the old established industries.

Another problem to be overcome was that some of the industries closer to Chicago trucked their l.c.l. freight to that city. The fast overnight service of the South Shore Line and lower cost are rapidly overcoming this competition. Large freight receiving stations are maintained in each of the cities served. Tracing of delayed shipments by wire, close personal contact between South Shore Line solicitors and traffic agents of the shippers, courtesy and modern appurtenances are among the factors contributing to the freight increase.

Six Locomotives Handle the Business

The freight handling equipment consists of six 80-ton Baldwin-Westinghouse electric locomotives, four put in service a year ago and two received the latter part of March this year. Each can haul trains in excess of 1,500 tons on comparatively level sections of the system, the weight of the train being adjusted according to the grades. Short stretches of heavy grades exist between Kensington and Gary. The locomotives can be operated in multiple, providing a considerable range in tractive effort, and will have a combined total output of 3,200 hp.

The steeple type cab is carried on swivel trucks. The rigid truck bolster is of cast steel bolted to the side frames. Hangers from this rigid bolster carry through semi-elliptic springs, a spring bolster. The cab is thus spring-supported on the truck frames, which are in turn spring-supported in the usual manner from equalizers on the driving boxes. Each truck has spring-mounted side bearings. The cab underframe is built of heavy rolled steel channels, the side and transverse members being connected by knee castings. Heavy end bumping and coupling castings are bolted to the longitudinal underframe channels.



LaSalle Avenue freight station in South Bend, Ind.

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PRINCIPAL DIMENSIONS, WEIGHTS AND RATINGS OF SOUTH SHORE LINE LOCOMOTIVES

Axle calssification	B-B
Motors, axle mounted:	
Maximum speed	45 m.p.h.
Total weight	160,000 lb.
Horsepower—one hour short field	1,600
Tractive effort—one hour full field	29,200 lb. at 18.6 m.p.h.
Tractive effort—continuous full field	17,200 lb. at 21.7 m.p.h.
Driving wheel diameter	42 in.
Rigid wheelbase	104 in.
Length over bumpers	434 in.
Length between coupler knuckles	39 ft. 4 in.
Length over bumpers	36 ft. 2 in.
Height, top of rail to roof	12 ft. 1¼ in.
Total wheelbase	27 ft. 0 in.
Rigid wheelbase	8 ft. 8 in.
Truck centers	18 ft. 4 in.
Width over all	10 ft. 7 in

The two trucks are each equipped with two Westinghouse type 358-D-5, 750-1,500-volt field control, forced-ventilated motors, with single-reduction spur gears, having a ratio of 16:72. Current collection is provided by a spring-raised, air-lowered, double-shoe pantograph.

The master controller, which operates on a 32-volt circuit, contains nineteen notches, ten in series and nine in series parallel. There are four economic running positions, namely, full and short field connection in both series and series parallel.

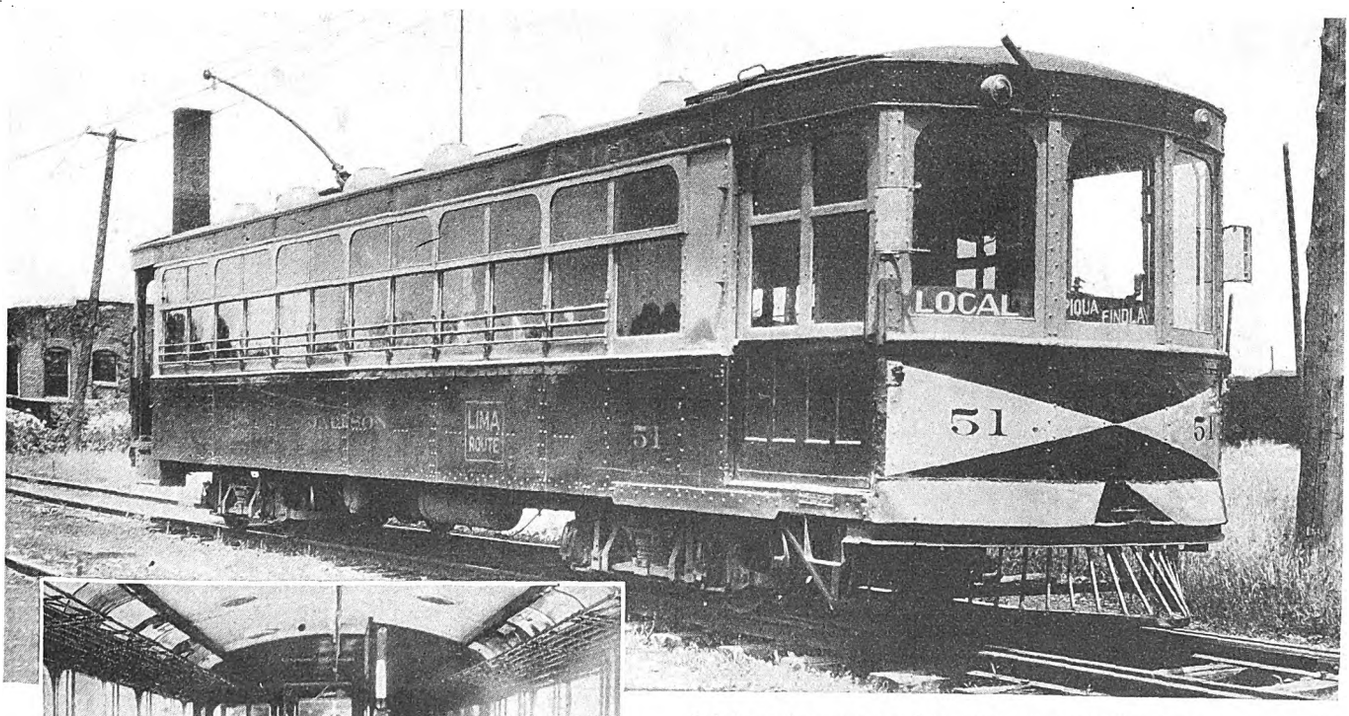
Each locomotive unit is equipped with a 2½-kw., 1,500-32-volt motor-generator set and an auxiliary battery. The motor-generator set is interchangeable with the sets employed on the motor cars of the system and the method of operation is similar. The two blower sets employed per unit consist of a 1,500-volt motor driving a Sirocco fan. The equipment is mounted on each end of the locomotive and supplies air to each end of a common duct running the entire length of the locomotive. A baffle is provided at the mid-point of the air duct. Under ordinary operating conditions this baffle is closed and each blower supplies air to the two motors nearest to it. In the event of a failure of one blower equipment the baffle can be opened and the air duct closed at the end adjacent to the blower motor which is out of commission.

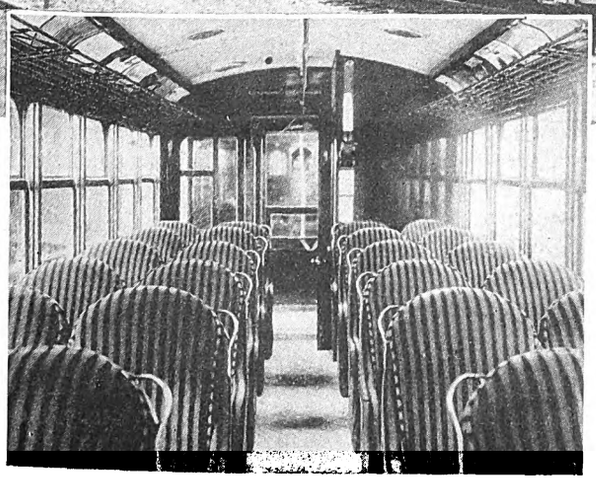
Two 53-ton switching locomotives also were purchased and are being used in switching and incidental service.

Western Ohio Revamps Interurban Cars

WITH the present trend toward de luxe service and a desire to furnish more comfortable and attractive rides, the Western Ohio Railway has recently remodeled seven of its light-weight interurban cars. As these cars were comparatively new they were not rebuilt, but the interior was refinished and composition rubber tile flooring laid to harmonize with it. The passenger compartment has chair type seats covered in striped velour arranged in pairs on each side of the aisle. In the smoking compartment the interior finish is similar, except that the seats are leather covered.

Each of the seven cars is painted a different combination, using bright colors with two-tone pennant front dash design. The name of the car is in the center of





Bright colors are used to give an attractive appearance to the outside of the cars. The striped velour seats and rubber tiled floor give a pleasing interior

the side, flanked on each side by the company insignia. Each car is named after a president of the United States.

The Western Ohio Railway has received many favorable comments on the changes, indicating that the remodeled cars are meeting with the general approval of the riding public. In addition, two new equipments each consisting of four Westinghouse type 333 motors and HLF control were purchased.

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Public Relations Man Plays an Important Role

By J. J. Davies
Assistant to the President Philadelphia Rapid Transit Company, Philadelphia, Pa.

Philadelphia Rapid Transit Company's public relations department serves in a dual capacity. It represents the company in all dealings with the public and at the same time champions the car riders with the operating departments

The P.R.T. public relations department renders a 24-hour telephone information service

WHAT sort of a "critter" is a public relations man? Five years ago there was scarcely such an individual in existence, at least in the transportation industry. For instance, while the public relations department of the Philadelphia Rapid Transit Company is a rather complex structure because of its association, direct or indirect, with every company activity in which public contacts are involved, it was not long ago that no such set-up was in existence. Public complaints were handled directly by the transportation department, there was no definite advertising policy, every operator made his public contacts according to his own judgment and inclination. The riding public lacked within the company a sympathetic auditor to whom it could take its troubles and know that they would be given intelligent and effective attention. And so, due to lack of attention, many troubles which were largely imaginary or at any rate easily adjusted, assumed extraordinary proportions.

Today all that is changed. An organization has been built up of trained men, experienced in all of the phases of public dealings that may occur in a co-ordinated transportation system such as the Philadelphia Rapid Transit Company. These men are charged with the responsibility for handling complaints, advertising, publicity, dealing with civic organizations, investigating conditions leading to requests for increased or altered service, running a well-equipped information bureau and the lost and found department, meeting the public more than half way at every conceivable point.

It is in a dual capacity that the public relations department serves. Not only does it stand behind the sales counter in marketing the transportation wares of the organization; it also stands ready at all times to carry the just pleas of the car-riding public before the operating heads and to request that they show cause why those pleas should not be recognized. Obviously, a delegation of citizens could not sit in the transportation con-

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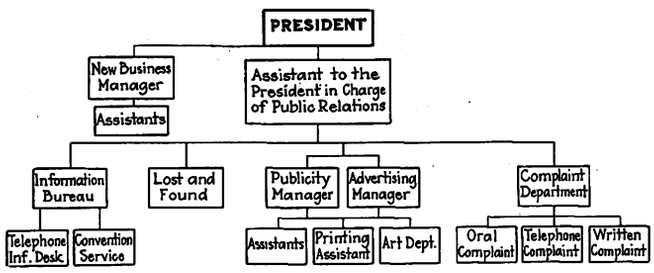
ference and argue in favor of their several needs. But the public relations department is constantly rubbing shoulders with civic associations, newspaper editorial writers, individual petitioners and similar representative units in the community life; it knows what the public wants, what it is justified in seeking. So it is that the car rider has a champion at court, an intermediary that is able to analyze his needs and present them to the management in a favorable light. If at the time those requests of the public cannot be granted in toto, then the why and the wherefore are frankly explained by the public relations contacts.

As the work of this service bureau becomes more generally known and understood throughout the community, it adds immeasurably to the good will existing between the company and the public. Also, this better understanding adds materially to the work and to the responsibility of the public relations department.

A transportation company which has not at present a definitely organized public relations department might be inclined to ask: "How large and how comprehensive a set-up would be required to handle our own dealings with the public?" The answer to that question, of course, depends on the size of the company and the community which it serves, the nature and extent of its operations, and the energy and resourcefulness of the individuals chosen to undertake the job. One live wire, with the right personality and a proper understanding of his work, could accomplish wonders for a small property.



Organization chart of the P.R.T. public relations department

But when the situation is similar to that in Philadelphia it is more complex. The Philadelphia system embodies street cars, subway and elevated lines, motor buses, both city and intercity, and a large fleet of taxicabs. Naturally, these diversified activities introduce widely varying problems of public service.

The constituent parts of the public relations organization are closely allied, and tie in closely with the recently created new-business department, whose specific function is to follow through the various new-business leads developed by the other units.

While there is this close tying in between the various units in the public relations department, each division has its particular functions and responsibility. For example, advertising and publicity are handled by men who, by virtue of earlier experience in newspaper and trade journal work, have the peculiar viewpoints necessary. With the advertising and publicity work is combined the responsibility for all of the printing incident to the production of company publications, read-as-you-ride folders, direct-mail material, notices of service changes, and the like. This printing activity alone entails an annual expenditure of approximately $80,000.

The group of individuals who handle passenger complaints, contacts with civic organizations and similar matters, have been specially trained to analyze and to determine the justice of requests for added service and the practicability of granting them. The men who compose the staff of the information bureau have served formerly as trainmen and, through long association with the complex transit system of the city, have gained the knowledge necessary to answer almost any conceivable question concerning transportation facilities.

These are only examples of the groups of specialists who make up the public relations department. There is one thing every member of the organization has in common—a deep-rooted appreciation of the public's viewpoint, a desire to render a well-rounded service to those who seek their assistance. They are the salesmen de luxe of the organization, seeking to put over the idea of service with both riders and company employees.

Salesmanship an Important Function

The actual day-by-day salesmen of the organization are the trainmen, the bus operators and the cab drivers. They are the ones who ultimately must please the customers and convince them that the goods offered are the finest obtainable and not to be rivalled by the homespun material, i.e., the private automobile. The public relations staff might be likened to the window dressers, the experts who have a highly developed sense of practical psychology and who have learned to array their display in the most favorable light.

Advertising of such a commodity as public transportation, generally speaking, directs attention to the advantages presented by the services of a particular company. Publicity follows the advertising through, supplements it, and helps the public to keep in mind the realization that the company is ever ready to convey its patrons wherever their destinations may be.

Both of these specialized functions would avail little or nothing if the rank and file of conductors, operators and drivers, failed to accomplish their mission as personalized salesmen. No more would they be successful if the articles sold—in this case, car, bus and cab rides—failed to measure up to the standard of quality advertised by the company and demanded by the customers.

It easily may be seen, then, how important it is that the goods are first "as advertised"; second, that the salesmen who actually come into daily contact with the public realize the value of their wares and look upon themselves as joint proprietors in the business, and third, that these employee-owners receive the best possible backing up from the public relations department.

It is even more important to sell the men on the true significance of their jobs than it is to sell the public upon the merits of the service. To that end the public relations group is charged with the editing of the P.R.T. *Co-operator,* the medium of contact between management and men, and incidentally, a medium whereby the gospel of salesmanship, courtesy and efficiency may be sold to the more than 15,000 employees in the organization.

In addition to this direct contact, the public relations department, through following up complaints against individual employees on the grounds of discourtesy, passing up passengers or other marks of an unsalesmanlike attitude, helps to bring about a better understanding on the part of the employees of how to deal with the public. When repeated complaints are lodged against an employee, he is reinstructed in the elements of salesmanship, and if he still provokes complaints he is discharged.

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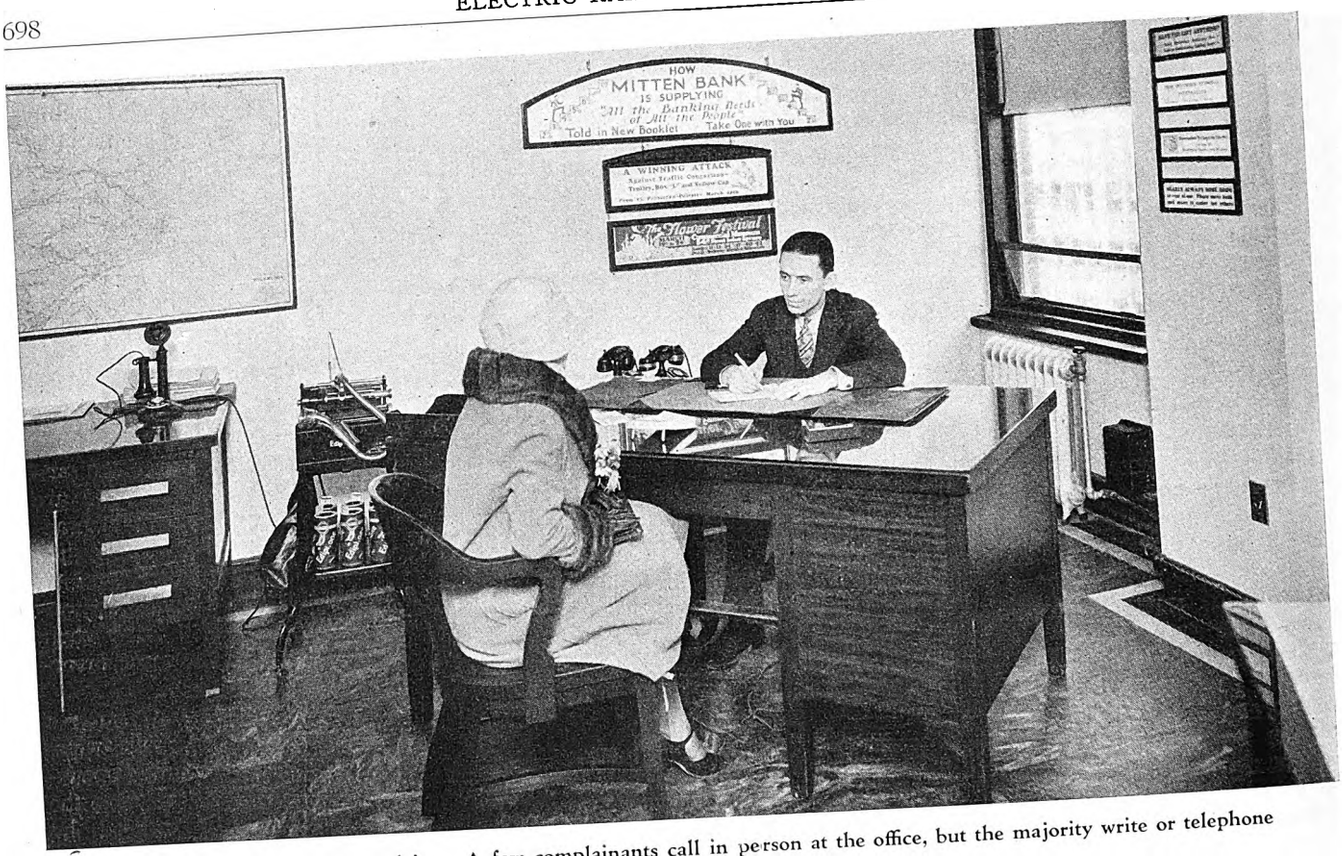

Taking the details of a complaint. A few complainants call in person at the office, but the majority write or telephone

Not the least important duty of the members of the P.R.T. public relations department is to place themselves upon a basis of reasonable understanding with leaders in the various communities encompassed by the metropolitan area of Philadelphia. When there seems some likelihood that a misunderstanding concerning the prospective activities of the company may arise in a particular section, extraordinary pains are taken to reach the important organizations in that community and to win their support of the move.

Contracts with Civic and Community Organizations Are Carefully Maintained

Whenever an opportunity presents itself to provide a speaker for a luncheon club or some other organization which has a real interest in transit matters, that opportunity is eagerly seized upon by the public relations department. Its own members, and others of the official family of the company, have heretofore done most of the speaking in public, but efforts are now under way to develop a speakers' bureau that can function in a more comprehensive fashion. The membership of this bureau will be recruited from both sides of the employee-employer family, individuals who have a natural aptitude for speaking and who would find real pleasure in carrying the viewpoint of the company to the man in the street.

Another important contact is the community newspaper, the weekly publication devoted to the interests of a particular section. More than 40 of these papers are published within the Philadelphia area and their influence is constantly on the increase. They fill a need which of necessity the great city daily newspaper must ignore. As a consequence, their friendly co-operation with the transit organization is much to be desired.

Whenever a general advertising campaign has been under way, the advertising department has made it a policy to place generous displays in all of these publications which are accredited news organs. Needless to say, the small weekly publications are more appreciative of such co-operation than are the metropolitan dailies. The many small voices speaking in fairness occasionally reach more ears and carry more weight than the one stentorian voice crying anathemas.

How Complaints Are Handled

People who have a bone to pick with the company do that picking in three ways; they call in person at the public relations offices, they telephone or they write. By far the greatest number adopt the latter method. Complaints cover every imaginable type of grievance, real or fancied, and every one is given the most exacting attention.

Occasionally the cynical opinion is expressed by some member of the public that it is of little use to make complaints to the company since these documents are probably consigned to the wastebasket. Actually, however, the most meticulous care is observed in examining the merits of each case, with a view to settling it in a manner that will be satisfactory to the complainant and of value to the transit organization.

When a complaint letter arrives at the public relations office it is immediately acknowledged, the complainant being assured that immediate and effective steps will be taken to remedy service conditions, to discipline erring trainmen, or to meet the situation outlined in the letter, provided that the complaint seems reasonable and justified. However unreasonable it may be, it detracts not a bit from the courtesy of the reply.

It is interesting to note that a certain number of almost professional "kickers" are always in evidence. Month after month complaints roll in from these grumblers, most of them inconsequential and frequently unjustified, yet never does the tact and diplomacy of the

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complaint handlers fail them. One of the prime requisites for the man who is to conduct public relations work successfully is the "patience of Job."

After the complaints, oral or written, have been acknowledged they are referred to the operating departments and such disciplinary or remedial action is taken as is justified. A report is then made to the public relations department, so that each complainant may be notified as to what action has been taken or is being planned. If it is not found possible to follow his suggestions the company's position is carefully explained, so there may be no reasonable ground for the feeling that the company is insincere in its attitude.

Only in the event of disciplinary action against employees is an exception made in giving the full details to the complainant. Then the customer is assured that appropriate steps have been taken to prevent a recurrence of the conditions with which he or she found fault. The trainman may actually be put on the extra list, or even discharged, but it is believed that no good comes from giving these details to the public.

A Research Laboratory for Improving Service and Good Will

Important among the several functions of the public relations group is that of securing data on possible ways of adding to the efficiency and attractiveness of the service. This, in turn, will have its effect in improving the good will existing between the company and the public.

Periodic canvasses are made of the large industries in and about Philadelphia to determine whether or not the transportation needs of the employees are being adequately met. The stockholders of the transit system are asked from time to time to suggest ways and means in which the service and good will of the company may be improved. Close contact is maintained with the public and parochial schools of the city, for the transportation of school children is a most important element of the company's service and it is essential to know how this responsibility is being discharged.

Detailed records are kept of all types of complaints and commendations received, so that a monthly chart may be prepared. A check of these monthly charts over a period of years shows an encouraging downward trend in the volume of complaints received involving discourtesy, inadequate service, passing up passengers—in fact, all along the line.

Service Bureaus Make Friends for the Company

Such functions as the lost and found department and the telephone information service are integral parts of the public relations set-up. They are essentially there to render the extra degree of accommodation, the unexpected bits of service, which go so far in making friends for the entire organization.

The lost and found department is centrally located in the Mitten Building, accessible to the greatest number of people. It represents every branch of the P.R.T. service and lost articles are forwarded there with unusual speed and surprising frequency.

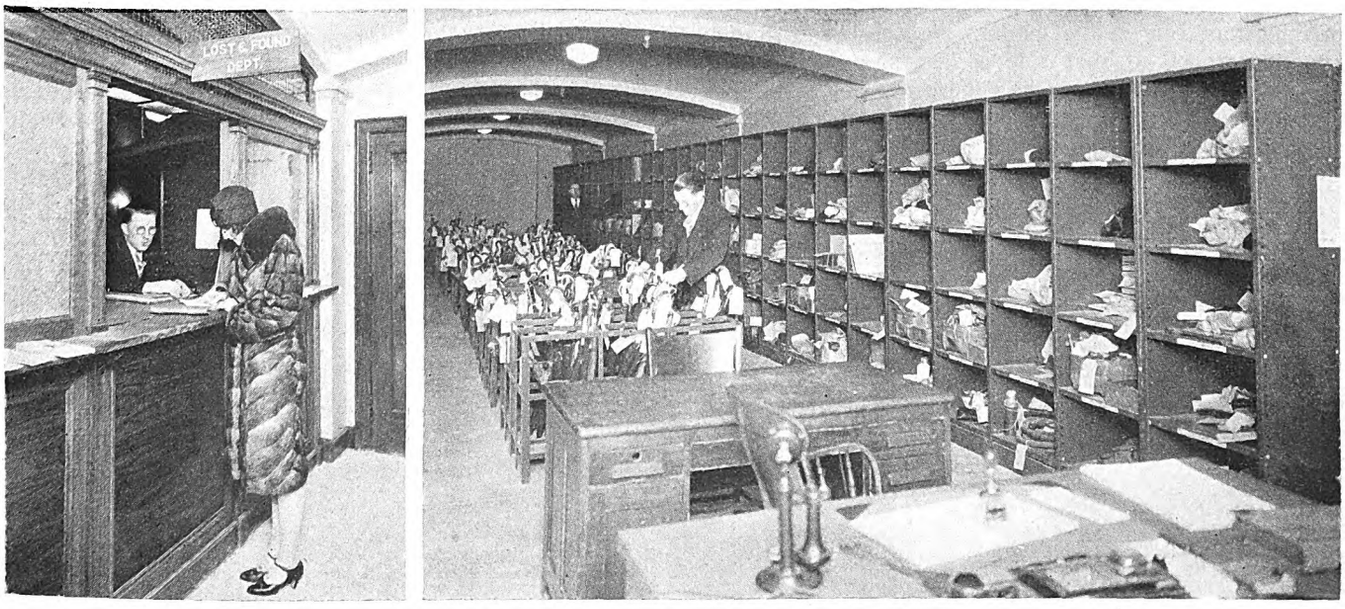
The telephone information service renders a 24-hour per day assistance to the individual who wishes to know how to get from where he is to where he wants to go. Questions are not confined to transportation; far from it. The information men are expected to know when Sunday school begins in the "so-and-so" church, when Colonel Lindbergh is expected to arrive, or where the best place is to get a bargain in used cars. It requires an inspired memory and a fertile mind, does the information desk.

Whenever a large convention arrives its directors may avail themselves, if they so desire, of the services of a trained information man to assist the delegates about the city and to provide them with whatever information on historical or industrial Philadelphia they may desire.

In addition to these various direct services, the company takes pains to give printed notice of impending service changes, temporary or permanent reroutings, etc., prior to the dates when those changes are scheduled to take place. These notices take the form of car cards, pole signs, and "read-as-you-ride" folders, which are distributed in boxes provided in all cars, buses and taxicabs.

Special Campaigns To Build Good Will

Entirely aside from the normal routine of the public relations work has come, from time to time, the conducting of a special advertising and feature campaign, de-



At left—Retrieving a possession from the lost and found department, located in the basement of the Mitten Building. At right—Section of the lost and found department, showing the great number of articles returned and how they are cared for

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Militancy Made This Road Pay!

ARKANSAS has known no electric railway abandonments. And of the roads in that state none is more interesting than the one in Little Rock, where many economies have been put into effect. Economy, however desirable at times, is but a negative virtue. One of the features in the JOURNAL for May 5 will be the story of how the company turned the tide of receipts with improved service, backed by an advertising campaign.

signed to forward the worthwhile phases of community endeavor, and in so doing to establish the company ever more deeply in the hearts of the general public. Such an effort was the "Will Livelong" safety campaign of April, 1927. Such, again, was the "80 per cent" campaign carried on during the past winter season to arouse the group consciousness of the car rider to the fact that he constitutes 80 per cent of the users of street space and yet is grudgingly accorded only a very small strip of the street area. It was not a slap at the motorist, but rather an effort to picture the traffic conditions of the city just as they exist today, and to suggest ways and means of bringing about at least temporary relief.

The expenditures required by such efforts as these have proved more than justified by the definite results obtained in quieting thoughtless criticism of the company in matters beyond its power to control. By explaining the position of the transportation system frankly and openly, public approval has been won increasingly.

Most recent among the efforts of the public relations department has been the winning of the approval of the management to provide for the instruction of all new employees in salesmanship and every-day public relations philosophy. Along with this goes the reinstruction of older employees who have been repeatedly cited for discourtesy and other evidences of the wrong viewpoint in dealings with the public.

A certain amount of this instruction was given in years gone by, but no great emphasis was placed on the matter and it naturally was taken rather for granted by the new employee. Now he is destined to go through a course which will speedily disclose his fitness to represent the company in its relationship with its customers.

Thus it may be seen that the public relations man plays an important rôle in the modern transportation drama. The importance of that rôle is becoming increasingly apparent. He knows what he's there for and he'll either convert every other member of the cast to his way of thinking, or be thrown bodily out of the stage door.

Ornamental Viaduct Spans Kansas City Highway

ONE of the projects provided for in the Kansas City Public Service Company budget for 1927 was the replacement of an old wood-trestle viaduct located at the intersection of Mill Creek Boulevard and 43rd Street in Kansas City, Mo., with a new concrete-steel structure. The new viaduct provides for a single track and is approximately 310 ft. in length between the abutment pilasters. It is used by the Dodson line of the company which operates in part over the company's Country Club line and furnishes freight service between the southern limits of the city and the Westport industrial district.

The ornamental structure was designed to add to the appearance of the boulevard it spans. An arch treatment was carried out, three large spans being provided in the length. Two of these are over Mill Creek Boulevard, where the roadway is 60 ft. wide, and the third over 43rd Street. Because double-deck buses operate on the boulevard, a clearance of 13 ft. 9 in. was necessary.

Each span consists of a concrete deck on steel beams supported by steel plate girders incased in the parapet walls. The intermediate sections and approaches are concrete decks on steel I-beams, supported on bearing walls and abutments. The design provides for an 80-ton electric locomotive with a train of 80-ton gross weight gondola cars, with an allowance of 30 per cent for impact.

The trolley poles are of the hollow-spun reinforced-concrete type and will carry a lateral pull of 2,800 lb. at the trolley connections.

A temporary trestle was constructed to serve during construction. It was used not only to maintain regular service on the line, but also as a work track for handling materials.

The viaduct was designed and constructed by William G. Woolfolk & Company, Inc., engineers and constructors, Chicago, Ill.

The Mill Creek Viaduct of the Kansas City Public Service Company adds to the appearance of the boulevard it spans

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Maintenance Methods and Devices

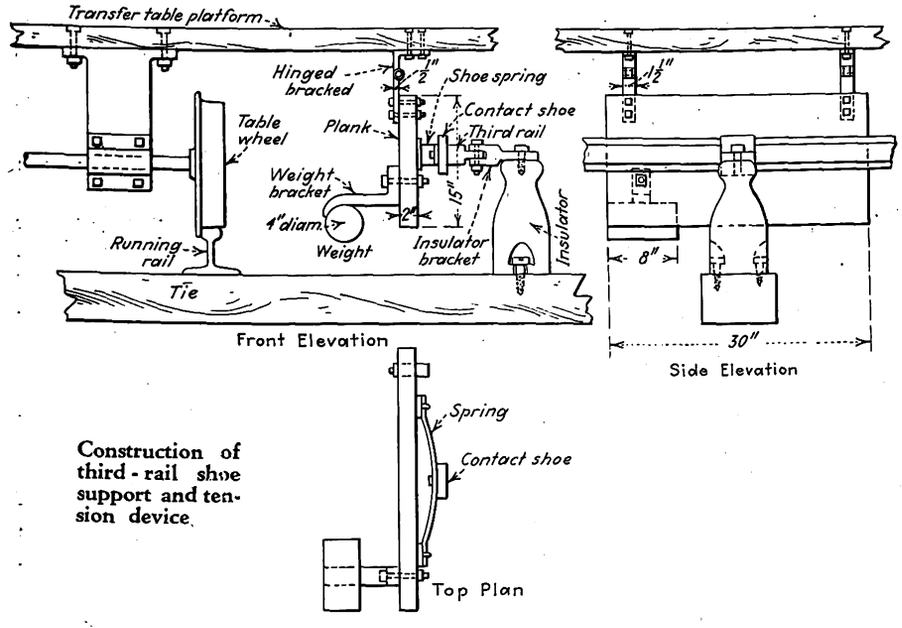
Automatic Device Maintains Third-Rail Shoe Pressure

DIFFICULTY is often experienced in maintaining a proper electrical contact between the contact shoe and the third rail of the transfer table. This was true with the transfer tables in the inspection house and shop of the New York & Harlem Railroad, New York City, until an automatic pressure regulator for the transfer table third-rail shoe was designed. This is shown in the accompanying illustration.

Previously, when the wheel flanges and journals became worn or if the running rail or third rail were in any way distorted, due to climatic changes or mechanical defects, the electrical contact was lost entirely at certain points. The shoe support was fastened to the truck framing previously and the only adjustment was that allowed by the spring compression and shimming. The device designed eliminates entirely any need for adjustment by hand, since it is taken care of automatically at all times.

Two ½x1½-in. hinged straps are fastened to the underside of the transfer table platform at the proper distance from the center of the third rail. An oak plank 2x15x30 in., well seasoned and specially treated, is bolted to these hangers. A 25-lb. counterweight of 4-in. diameter and 8 in. long is suspended from a 1½x2-in. hanger, 6 in. from the back of this plank. This weight forces the plank and contact shoe towards the third rail at all times by gravity and thereby automatically adjusts the shoe for any rail irregularities immediately. The shoe spring in use is the same as is being used on the plows for conduit rail, but the shoe is somewhat larger.

This arrangement has been in service for over a year and to date not a single failure has developed.

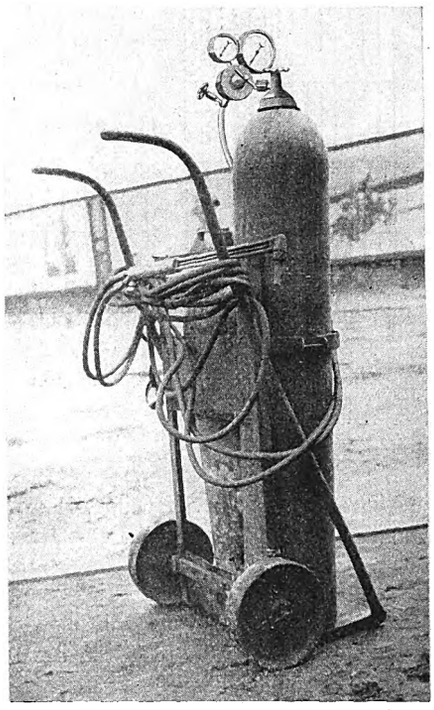


Construction of third-rail shoe support and tension device

Welded Framework Truck for Welding Outfit

DUE to the destruction by fire of some of the housing facilities at the shops of the Jamaica Central Railway, Jamaica, N. Y., it became necessary to perform a large portion of the welding work in the storage yard. The rugged welding truck illustrated was built for the transportation of the welding outfit.

The framework is welded. All of the vertical and platform framework is made of 1¼-in. angles. It is fastened to the ¾x1½-in. axle by means of a ¼x1¼-in. iron bracket shaped to fit over the axle, the ends being welded to the framework. A platform for the support of the tanks is made of 1/16-in. sheet iron, welded to the angle framework. The vertical members are strengthened by ¼x8-in. plates welded to the uprights. The handles are made from 1-in. pipe, welded to the platform and vertical frame. Iron wheels of 10-in. diameter and 2½-in. face, spaced on 24-in. centers, provide for easy movement. The over-all width of the framework is 20 in. and the handles 21 in. The platform is 14 in. long from the center of the axles to the end of the framework, and the over-all height of the framework is 38½ in. The tanks are held firmly by 1/16x1½-in. straps welded to the ¼x8-in. reinforcing plate.



Welded truck to hold oxy-acetylene welding equipment

Making Removal of Cab Heaters Easy

By Benjamin H. Hall
Shop Foreman West Penn Railways, McKeesport, Pa.

WHERE individual heaters for motormen are used on the platforms of cars it is frequently desirable to remove them quickly for repairs. Where these are fastened permanently by four machine screws removal requires considerable time. In addition to this, when another heater is reinstalled frequently the drilling for the fastening screws varies so that additional holes must be drilled and tapped.

To provide a convenient mounting

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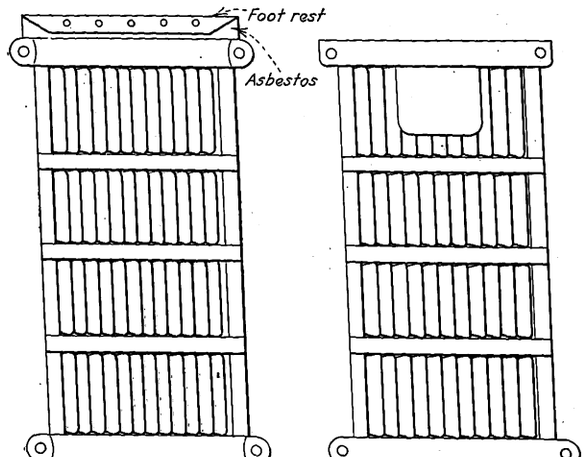


Method of installing cab heaters so that they can be removed quickly

so that heaters can be removed and installed readily the West Penn Railways uses a clamping arrangement that has proved of particular value. It can be installed cheaply, and when a heater has an open circuit it can be removed by disconnecting two small two-way connectors for the leads and then can be lifted out and a new one set in place. Heaters cannot be changed in service.

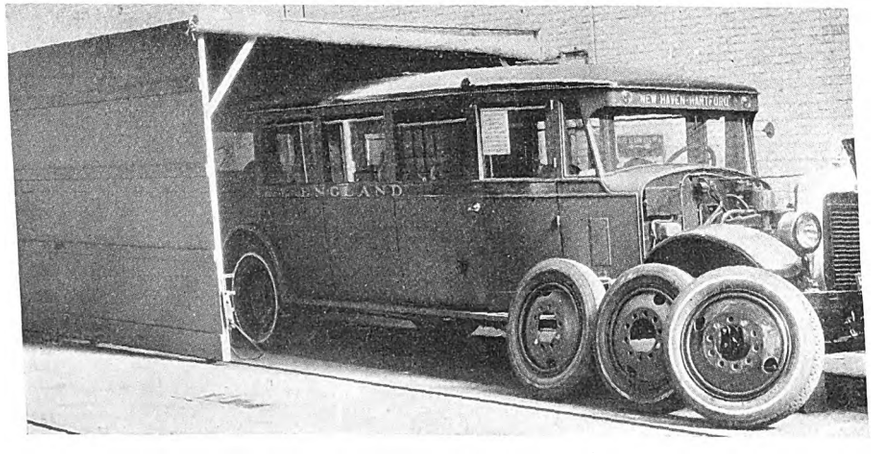
Two brackets of bar steel $\frac{1}{8}$x1 in. are fastened to the inside panel of the cab and two other brackets are fastened to the heater. The brackets on the car form a pocket into which the heater brackets fit.

Portable Dryer Reduces Bus Painting Time

BUSES can be repainted in three days with a portable, electrically-heated drying shed, designed by James E. Dooley, master mechanic at the Grand Avenue shops of the Connecticut Company, New Haven, Conn. The shed, which measures 35 x 12 ft. x 9 ft. 6 in., is made of 22-gage sheet steel with a frame of $1\frac{1}{2}$-in. angles and weighs 2,800 lb. The sides and roof are of metal but the ends are of heavy canvas to permit easy opening. The shed is mounted on ten small wheels and can be rolled into position over a bus with little effort. Heat is furnished by ordinary car heater units, two rows of coils being mounted on each side about 2 ft. above the floor. The heaters are arranged in four 500-volt d.c. circuits and require a current of 50 amp. The temperature maintained in the shed for drying varies from 110 to 120 deg. F., which dries the paint quickly without cracking or checking. A small window in the side of the shed lets in light on a hygrometer and a thermometer so that readings of the temperature and humidity can be made at regular intervals.

A bus brought in for repainting is thoroughly cleaned and dried in the shed during the morning of the first day. It then receives a coat of enamel and another drying in the shed. Late the first afternoon the bus is given a second coat of enamel and then is housed to dry overnight. The second morning it is striped and lettered, and again placed in the shed. The third morning it is varnished, completing the job. When thoroughly dry the bus is removed from the shop, all ready to be again put in service.

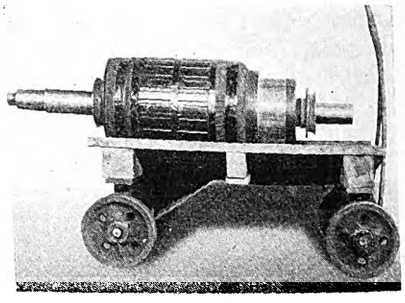
With this apparatus a bus can be painted in three days, whereas the time formerly required was six days. Since the fixed charges on a bus are the same when it is in the shop as when it is in service, this effects a substantial monetary saving. This process is used for buses of the New England Transportation Company as well as for those of the Connecticut Company.



Portable shed used in Grand Avenue shops of the Connecticut Company to speed up process of bus painting

Armatures Are Moved Easily With Hand Truck

LITTLE time is lost in transporting armatures around the shop of the Binghamton Railway, Binghamton, N. Y., since a special hand truck was designed and constructed for this work. This truck, made of wood and steel, is 14 in. high, 18 in. wide and 33 in. long. The end timbers of the platform framing are 4-in. x 4-in. oak and the center timber 2-in. x 3-in. oak, all being concave on one side to suit the diameter of the largest armature to be handled. Strips of 1-in. x $2\frac{1}{2}$-in. wood fastened to these timbers form a strong support for the armatures and the curved surface prevents the armatures from rolling during transportation. The platform is strengthened further by $\frac{1}{2}$-in. steel plates which are installed under each cross beam.



Truck used in Binghamton for moving armatures about shop

The front and rear axles are fastened to oak bolsters 3 in. thick. The rear bolster is held in place by bolts extending through the platform, end timber, reinforcing plate, bolster and axle. Additional strength is secured by two $\frac{3}{8}$-in. x 1-in. braces extending from the axle to the center platform timber. The front bolster is held in position by a $\frac{3}{4}$-in. king bolt which permits of easy rotating movement. Four 8-in. x $1\frac{3}{4}$-in. cast iron wheels and a handle made of $\frac{3}{4}$-in. round iron provide for easy movement throughout the shop.

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New Equipment Available

Electric Gluepot

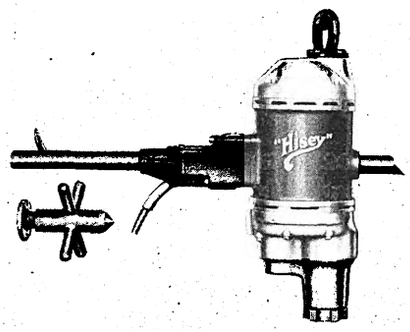
COMPACT glue-heating equipment that can be carried to the job instead of taking the work to the gluepot is announced as a new product by the Black & Decker Company, Towson, Md. With this equipment glue is maintained at a constant temperature of 150 deg. F. which is said to give the best working consistency for smooth, tight joints. The heating element is a Nichrome ribbon insulated with mica plates. The control is thermostatic. The glue container, which has a capacity of 2 qt., is cast aluminum, machined to fit a gray-iron receptacle for conserving heat.

Portable electric gluepot

The heating element is sealed tightly with asbestos to eliminate fire hazards, short circuits, etc. The sides of the pot are sloped to minimize spillage, and a heavy iron wiper across the center of the glue container prevents waste from drippage.

Universal Drill

SEVERAL improvements appear in a universal drill of 1¼-in. capacity announced by the Hisey-Wolf Machine Company, Cincinnati, Ohio. The motor is mounted in ball bearings which in turn are fitted to eliminate the slip and creeping action so detrimental to the motor and other mechanical parts. The gear on the armature shaft is removable. All gears are proportioned for maximum strength and smooth running. They are made of high-grade steel, electrically heat-treated. The compound gear shaft has a bearing at each end.



Universal drill of 1¼-in. capacity

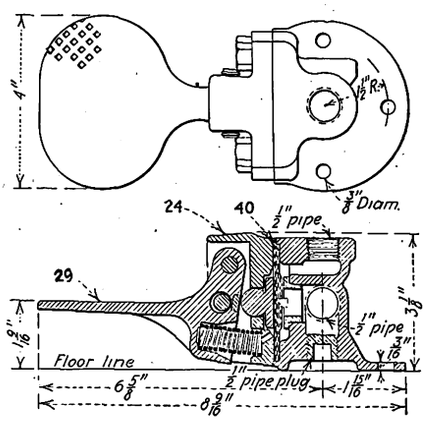
The drill spindle is fitted with a No. 3 Morse taper socket. It is of liberal dimensions, hardened and ground, and is automatically lubricated through the gear case. Brush-holders are provided with adjustable spring tension and the end handle cover is a rugged casting independent of the motor and motor bearings. This relieves them of strain and affords a convenient means of access to the carbon brushes for adjustment or renewal.

"A bird in the hand is worth two in the bush." So a car on the road is worth two in the shop.

Independent Devices for Foot and Cut-Off Valves

FORMERLY a device furnished with safety control equipment by the Safety Car Devices Company included the combined foot and cut-off valve with the twofold function of preventing automatic application of the brake when a straight air brake application of predetermined amount was made and when the operator found it necessary to release the controller handle to relieve fatigue, make change, issue transfers, etc. Two independent devices of improved form are now announced by the Safety Car Devices Company, Wilmerding, Pa., to take care of these functions. These include a diaphragm type foot valve and a diaphragm type cut-off valve.

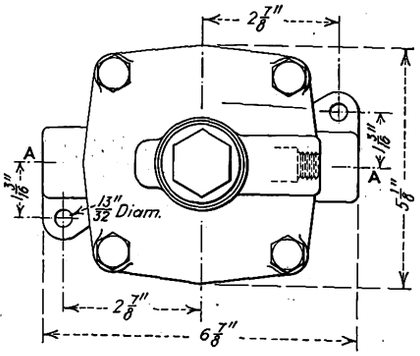
By making these devices in separate units instead of combined the equipment is simplified somewhat since only one cut-off valve is required for either single or double end equipment. The diaphragm type of construction makes the valves practically leak proof. In the foot valve illustrated

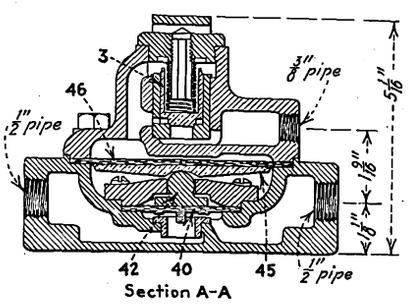


New type of foot valve

when pedal 29 is depressed the diaphragm follower 24 flexes diaphragm 40 inwardly so that the bead on the inside surface seals against the seat in the valve body, cutting off communication between the controller pilot valve and the emergency valve.

In the cut-off valve, when a predetermined straight air pipe pressure is reached, closing valve 3 lifts and allows air to flow to the top of the operating diaphragm 46. The pressure thus exerted acts through large and small followers 45 and 42 to flex the valve diaphragm 40 downward, causing the bead on its lower side to seal against the brass seat and thus automatically close communication between the controller pilot valve and the emergency valve. All diaphragms are made of Wabco material which, together with the unique structure, makes the valves tight and free from leakage.





Improved cut-off valve construction

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Association Activities

One-Man Cars in Europe*

Trials of one-man buses and cars are being made under stress of higher costs. One-man operation in Paris has been satisfactory and will be extended

By J. Champetier de Ribes
Transportation Manager of the S.T.C.R.P. (Paris Surface Railway and Bus Lines)

SINCE the war, the expense for platform labor has become an increasing proportion of operating expenses of electric railway and bus companies throughout the world. In Paris, during 1926, platform labor represented 29 per cent of the entire operating cost. Efforts to decrease it have been in various directions, such as (1) increase of schedule speed of cars and buses, (2) increase in size of vehicles, (3) operation of cars in trains, and (4) decrease of the platform labor cost by one-man operation, either by (a) the collection of fares before the passenger enters the car, or (b) by combining the duties of motorman and conductor. Of these methods, the first is becoming increasingly difficult owing to growing street congestion, and the second and third mean more stops per unit and therefore lower speed. Moveover, city regulations place a limit on the length of trains. The first alternative under (4) is used to some extent in Paris but is hardly practicable on city streets as ordinarily it means the use of prepayment areas. Hence the possibilities in reduction of labor costs lie largely in extending the one-man principle.

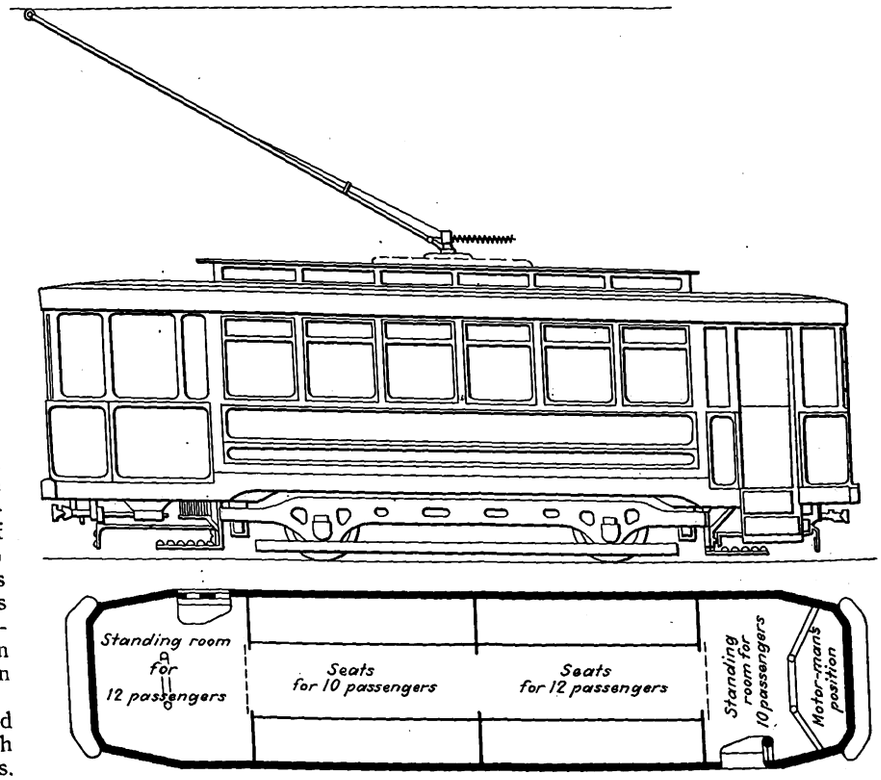
The idea is not new. It was used many years ago on a small scale with horse cars in America and also in Paris. As late as 1913 a Paris horse car line was run on this principle. The great development in one-man operation has occurred, of course, in the United States, beginning with the Birney safety car, but there have been trials of the system in Europe also. Thus, the Berlin surface lines introduced one-man cars on a small scale in 1923 on a line with light traffic. When the number of passengers increased, two-man operation was substituted.

The London United Tramways put in operation in 1922 a single-deck, single-truck car, like the Birney, with satisfactory results. Later, four double-truck cars, weighing 12 tons each, with interlocked pneumatic door control and other safety features followed. The Rooke register was used to collect fares and a change-making machine was installed. The seating capacity was 30 passengers and a schedule speed of 10 m.p.h. was attained. The motorman was paid a somewhat higher wage because of the added duties performed. These cars did not meet popular approval, but this may have been because they were single-deck and the British riding public favors double-decks.

The Basle (Switzerland) Tramways put a one-man car in operation in 1927 as a trial. It was similar to the Birney in design and had full safety equipment. The results are not available.

The Malmoë (Sweden) Tramways has one city and three suburban lines with one-man operation and despite the payment of a higher wage to the motormen, platform expenses were reduced 46 per cent. The schedule speed is 9.3 m.p.h., instead of 9.7 with two-man cars. The zone system of fares is used, the passengers paying on entering. The results have been satisfactory.

The Arnhem (Holland) Tramways put some single-truck one-man cars in operation in 1923. Each had accommodations for 18 seated passengers and 14 standing passengers. The results have been so good that all cars on the system have been changed over for one-man, including cars with a capacity for 24 seated and 25 standing passengers. The headway has been reduced. The recent adoption of the unlimited-ride weekly pass has undoubtedly helped the problem of fare collection.



Type of one man car used by the Paris surface lines

The S.T.C.R.P. has been operating for some time a one-man car of the type shown in an accompanying illustration and has recently expanded this service to fifteen cars. Only one class of passenger service is given on these cars, instead of two, the usual practice in Paris. Automatic sanding and braking are used and the doors are controlled by the operator in the usual American manner, except that they are arranged so that they can be opened from the inside by the passengers.

One-Man Cars and Buses in Paris

In 1924 the S.T.C.R.P. put 50 one-man buses in operation. They were designed primarily for express service between the center of the city and the outskirts, and each had a capacity of 25 seated passengers, but carried only one class. They were equipped for a speed of from 20 to 25 m.p.h. Entrance and exit were at the front only. Later, several 38-passenger one-man buses were built, also with entrance and exit

**Abstract of paper presented at the convention of L'Union des Voies et des Transports Automobiles (Railway and Bus Association of France), held in Marseilles, Nov. 6-8, 1927.*

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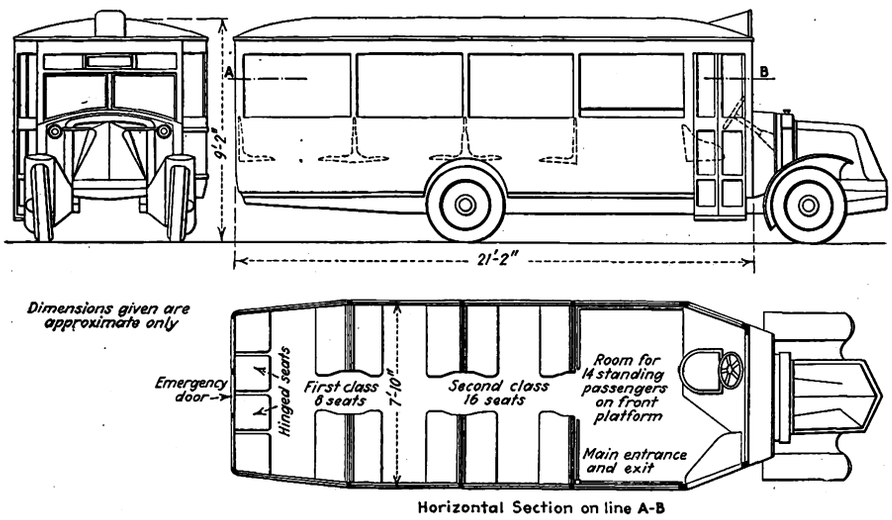

This one-man bus used in Paris accommodates 38 passengers

in front, but designed to carry two classes of passengers. The body has a length of 21 ft. 2 in. and wheelbase of 14 ft. 5 in. A line drawing is given of these buses, showing other dimensions.

There are more exact data available on the one-man bus service than on the Paris one-man trolley service.

The 50 express buses mentioned ran on five different routes, were in service only during the rush hours and made only two or three stops between terminals. The fares were somewhat higher than first-class fares on the regular buses, and no standing passengers were carried. The financial results were not satisfactory and the service was abandoned in 1925.

The objections were five in number, as follows:

(1) Running only during the rush hours, the buses were largely empty during alternate half trips. (2) The higher fare adopted because of the expensive operating conditions appeared prohibitive to many persons who otherwise would have patronized them. (3) To increase the schedule speed, each line had an average of only two loading stops, but although these stops were chosen with regard to their desirability from a traffic standpoint, it was found hardly possible to obtain sufficient passengers going from these points to fill the bus seats. (4) Because of this small patronage, the buses were run on a pretty long headway, which made the lapse of time for many passengers about the same as if they used the regular service. (5) The street congestion was such that the express buses were able to make a schedule speed of only 22 m.p.h. This was a gain of only about 40 per cent over the speed of the regular buses, which was 15.6 m.p.h.

After this express service was abandoned, the buses were transferred to lines in the suburbs, but one-man service was continued and under conditions which permitted careful study. For instance, one line was divided into three fare sections and had twelve stops, of which three were obligatory. The distances between stops varied between 800 ft. and 4,000 ft. Fare was paid as the passenger entered, but owing to the rather complicated schedule of fares the operator had to have tickets at eight different prices. Nevertheless the one-man buses made better over-all time over the route than two-man buses.

In expenses, maintenance for the one-man buses was higher, largely because they were equipped with pneumatic instead of solid tires. The total operating expenses, however, were 12 per cent less for the one-man buses, or 25.34 cents, instead of 28.67 cents, per bus-mile. Actually, these figures are not quite comparable because the two-man bus has places for 38 seated and standing passengers, whereas the one-man bus has places for only 30 passengers, of which 25 could be seated.

One-Man Vehicle the Type of the Future

The conclusions reached by the company are that the one-man vehicle is the vehicle of the future, though certain conditions must prevail. They may be summarized as follows:

(1) The system of fare collection should be so simple that fares can be paid easily and rapidly. Where a flat fare cannot be charged the rate should be such that fares can be paid with coins in common use. (2) The vehicles, whether buses or cars, ought to have ample carrying capacity. The Americans seem to be abandoning the small Birney 32-seat safety car for cars hold-

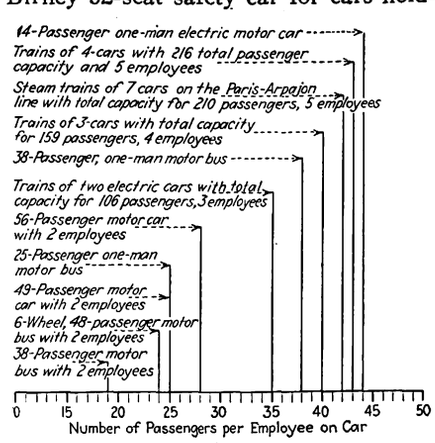

Chart showing the number of passengers per operator on various Paris vehicles

COMING MEETINGS OF *Electric Railway and Allied Associations*

May 2-5 — Southwestern Public Service Association, Dallas, Texas.

May 4 — Metropolitan Section, A.E.R.A., 33 W. 39th Street, New York, N. Y.

May 6-12—Union Internationale de Tramways, de Chemins de fer d'Interet Local et de Transports Publics Automobiles, Rome, Italy.

May 7-10—National Conference on City Planning, Dallas and Fort Worth, Texas.

May 8-11—United States Chamber of Commerce, Washington, D. C.

May 9—A.E.R.A. Executive Committee, Washington, D. C., 3 p.m.

May 9-10—Central Electric Railway Master Mechanics' Association, Lawrence Hotel, Erie, Pa.

May 9-12—American Institute of Electrical Engineers, regional meeting, Northeastern District, Hotel Taft, New Haven, Conn.

May 24—New England Street Railway Club, annual meeting, Boston, Mass.

June 4-6—Midwest Electric Railway Association, Hotel Baltimore, Kansas City, Mo.

June 4-8—National Electric Light Association, Atlantic City, N. J.

June 6-8—Canadian Electric Railway Association, annual convention and exhibit, Toronto, Canada.

June 14-15—New York Electric Railway Association, Half Moon Hotel, Coney Island, N. Y.

June 20-27 — American Railway Association, Div. 5—Mechanical, annual convention and exhibit, Atlantic City, N. J.

June 21-22 — American Railway Association, Motor Transport Division, Atlantic City, N. J.

June 21-22 — Wisconsin Utilities Association, Accounting Section, Hotel Pfister, Milwaukee, Wis.

June 28-29—Central Electric Railway Association, Cedar Point, Ohio.

July 8-12—Public Utilities Advertising Association and International Advertising Exposition, Detroit, Mich.

July 25-27—Electric Railway Association of Equipment Men, Southern Properties, Cincinnati, Ohio.

July 27-28—Central Electric Railway Accountants' Association, Detroit, Mich.

Aug. 16-17 — Wisconsin Utilities Association, Transportation Section, Sheboygan, Wis.

SEPT. 22-28, 1928

American Electric Railway Association, 47th annual convention and exhibit, Cleveland, Ohio.

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ing as many as 68 seated passengers. The trials being made in Paris with one-man cars of 44-passenger capacity should give good results. As for buses, the 38-passenger bus which has been mentioned should give better results than the 30-passenger bus.

No steps should be neglected in the education of the public to the use of these vehicles before they are actually put in service.

Equal care should be given to insuring the interest of the employee in making the experiment successful. The operator of a one-man car may properly receive a somewhat higher wage than the member of a two-man car crew.

Hotel Arrangements at Cedar Point

SPECIAL hotel rates have been granted for the summer convention of the Central Electric Railway Association, to be held at Cedar Point, Ohio, on June 28-29. At the Hotel Breakers the majority of the rooms will be available at $2 a day for one person or $1.25 each for two persons. There also are numerous rooms at the rate of $2.50 for one person or $1.75 each for two persons, and a limited number at higher prices. Rooms with bath are $4 and $4.50 for one person and $2.75 and $3.25 each for two.

At the Hotel Cedars most of the rooms are $2 for one person or $1.25 each for two, with a limited number $3 for one and $1.75 each for two persons. Rooms with bath are $3.50 for one person and $2.25 each for two persons.

At the Bon Air Annex all rooms are with bath and twin beds. A number are at $5 for one person or $3.50 each for two, while the majority are $6 for one person and $4.50 each for two persons.

All railroads grant tourist rates to Cedar Point which are considerably cheaper than the regular rates. Information regarding trains, fares and Pullman accommodations can be obtained at railroad ticket offices.

American Association News

Subjects and Meetings

DEFINITE plans for the Cleveland convention were blocked out at the meeting of the committee on meetings and subjects of the American Association held at association headquarters, New York City, on April 20. Chairman Frank R. Coates stated that he had presented the tentative program of the convention previously adopted to the executive committee and that it was approved with certain suggestions.

The general subject for the first day will be "Economics." This will include economics of public transportation and its future in cities, as well as developments going on in the transportation field. Tuesday will be left for inspection of exhibits, instead of Wednesday as in previous years. Tuesday evening, however, will be Advisory Council Night as heretofore. The subject for Wednesday's meeting will be "Modernization." On Thursday the subject will be "Viewpoint of Others on Our Industry." This is planned to include a series of addresses by men from outside the industry.

It is proposed to continue the round-table luncheon in a form similar to that used last year. It is now planned to have a total of fourteen of these groups with topics as follows: Monday—safety, fares, taxation, manufactures; Tuesday—interurbans, traffic, education, merchandising; Wednesday — financing, public relations, new cars; Thursday—freight, management, motor bus. It is planned to limit each luncheon to 50 people and if the demand is made for more seats, it will be determined later whether arrangements should be made for an additional group. These luncheons will be held at the various hotels and tickets will be sold in advance on application, similar to the method used last year.

Those present at the meeting were F. R. Coates, chairman; J. P. Barnes, H. V. Bozell, I. C. Bradlay, C. A. Brooks, H. C. Clark, G. H. Clifford, W. A. Draper, Charles Gordon, T. R. Langan representing M. B. Lambert, and W. T. Rossell, of the committee, and R. P. Stevens, president of the association; L. S. Storrs, managing director; Labert St. Clair, J. A. Miller, Jr., Leslie Vickers and J. W. Welsh, general secretary.

Traffic and Safety

SELECTION methods and the training of men were important subjects discussed at the meeting of the traffic and safety committee of the Transportation & Traffic Association, held at association headquarters on April 13. After the original assignments were reviewed by Chairman R. W. Emerson, the individual subcommittee chairmen reported on the development of their respective topics which had been assigned at a previous meeting.

Dr. C. F. Slocombe outlined his section of the report entitled "Make a Study of Men and the Causes of their Failure in Accidents." The Milwaukee psychological tests were discussed in considerable detail since one member of the committee, John A. Dewhurst, had made a special study of this particular topic. The consensus of opinion among the committee members was that more up-to-date information should be obtained. To this end the chairman will shortly appoint a committee to make a more detailed study of the recent results at Milwaukee.

"Accident Classification" was reported upon by Mr. Emerson who is working in conjunction with E. J. Murphy, statistician of the association. Mr. Emerson also reported on item No. 3, "Co-operate with the Committee of the American Engineering Standards Committee on the Study of Colors for Traffic Signals." S. E. Emmons, chairman of the subcommittee to study the question of improved schedule speeds as affected by fare collection, loading delays and traffic control systems, read an excellent report on the subject.

The committee was inclined to believe that with the subjects assigned the field was too wide to be covered by one committee's activities and that the final report would not be a thorough treatise on any one. Following a suggestion of Guy C. Hecker, the committee spent some time in discussing the advisability of concentrating on only one or two subjects for this year's report, leaving the balance of the work to be completed next year. The committee will decide this question finally at its meeting, which is planned for the first week of June. Boston has been selected upon the invitation of Edward Dana, president of the Transportation & Traffic Association.

Those present were R. W. Emerson, chairman; H. O. Allison, M. W. Cooke, S. E. Emmons, E. K. Miles, C. F. Slocombe, C. D. Smith, E. C. Spring, J. A. Dewhurst, Guy C. Hecker, and John A. Miller, Jr.

Motor Buses

REVIEW of the uniform motor bus specification code sponsored by the Society of Automotive Engineers and the National Automobile Chamber of Commerce was the principal business before special rolling stock committee No. 2—motor buses, at a meeting held at association headquarters in New York on April 16.

A number of suggestions were made relative to the code. With these suggestions, it was voted to recommend indorsement of the specifications for action by the standing committee on rolling stock.

The work of reviewing the uniform specifications code occupied the entire day. With regard to the other subjects assigned to the committee, Chairman Berry reported that it probably would not be possible to cover all of them this year, but that he and several of the other members have been working on some of these subjects and would in the near future be ready to submit material for comments and criticisms of the committee members.

The following members were present: V. W. Berry, chairman; H. C. Eddy, F. A. Klock, A. J. Scaife, H. D. Schultz, W. A. Blume, G. W. Wilson, E. H. Lamberger representing S. B. Cooper, A. Klein representing L. H. Palmer, and C. W. Stocks.

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News of the Industry

Key System Exonerated in Ferry Accident

United States steamboat inspectors have exonerated engineers of the Key System Transit Company, Oakland, Cal., of blame for the accident of Feb. 17 when the Key ferry boat *Peralta,* crowded with passengers on her way to Oakland from San Francisco, Cal., did a sudden nose dive and precipitated more than a score of persons into the bay. Five were drowned. The men exonerated are Edward Dyson, chief engineer of the *Peralta,* and Harry E. Hill, his first assistant. In announcing their decision the steamboat inspectors said that there was insufficient evidence to corroborate charges of inattention to duty and negligence which had been placed against the two men. It was found that some of the *Peralta's* passengers jumped, some were crowded and some were actually washed overboard. Causes assigned for the accident were a combination of swell from the passing Key Route ferryboat *Hayward,* the incoming tide, shallow water and the fact that the *Peralta* was down in the head.

Discontinuance of use of the ballast tanks on the *Peralta* and her sister ship, the *Yerba Buena,* is ordered and chains are to be installed on the two crafts to keep passengers far back from the bow. Both boats must proceed slowly over the shallow area in San Francisco Bay where the accident occurred, and only one day's supply of oil and water are to be carried on the boats to make them ride higher in the water.

Out to Win Coffin Award in Gary

An effort to win the Charles A. Coffin award is to be made by the Gary Railways, Gary, Ind. An announcement to this effect was made recently by president Charles W. Chase, who referred to the honorable record of the company and the splendid results of the recent rehabilitation program. All employees were solicited to get back of the movement and to help win the honor.

Ten-Cent Fare Sought in Savannah

A straight 10-cent fare for casual riders, a 5-cent fare for school children and tickets sold at the rate of six for 50 cents are being sought by the Savannah Electric & Power Company, Savannah, Ga. Savannah now has a 7-cent fare and tickets are sold at the rate of fifteen for $1 to regular commuters.

The petition of the company for an increase in fares was presented to the Georgia Public Service Commission on April 18 by Howard C. Foss, president of the company. The petition declares that the present schedule of fare rates forces the Savannah company to sustain an annual loss in its passenger department. It also states that the growing use of private automobiles has adversely affected the railway earnings.

Hearing was set for May 15 before the Public Service Commission. At that time arguments for and against the proposed increase in fare will be heard and a decision rendered.

Passes in Utah

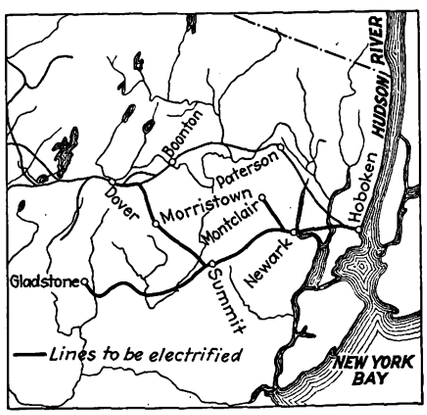
The Utah-Idaho Central Railroad has installed the weekly pass system on all of its lines operating in Ogden, Utah, except the line known as the Ogden-Huntsville line. The latter is not included, due to the long distance between points. Passes will be good for seven days and are transferable.

Ten Cents in San Jose

Experimental fares, calculated to produce sufficient revenue to net a 5 per cent return upon the property of San Jose railroads were authorized by the California Railroad Commission. The recent decision increased single local fares from 6 cents to 10 cents, with four tokens or rides for 25 cents. The same rates were also authorized for the Peninsular Railway on its San Jose local lines. These two railways applied to the commission for increased fares on the San Jose local lines, setting forth that present rates were entirely inadequate. The commission authorized the new fares as an experiment only, in the hope that the earnings of these companies would be improved to the extent that adequate service might be maintained. The new fares will be applicable on the local lines of the two companies in the City of San Jose, interurban fares not being involved in the proceeding.

Electricity for Another New York Road

Delaware, Lackawanna & Western to spend $18,000,000 on equipping suburban lines. Construction to start as soon as engineers report



District in which electrified lines will operate

BETWEEN $14,000,000 and $18,000,000 is to be spent by the Delaware, Lackawanna & Western Railroad in the electrification of the Morris & Essex line from Hoboken to Dover, the Passaic & Delaware to Gladstone and the Montclair branch, a total of 78 miles of road, or 173 miles of track, James M. Davis, president of the road, announced on April 23.

Construction work will be started just as soon as Lackawanna engineers can prepare plans and it is expected that electrification will be completed within two years. Direct current probably will be used. If it is necessary to purchase power from outside producers the cost will be $14,000,000, while if the railroad decides to construct its own generating plant and manufacture its own power the cost is estimated at $18,000,000.

This action of the managers follows the presentation of a petition of a joint committee, representing business and civic organizations of various communities in a section of northern New Jersey with a population of approximately 1,250,000 asking that the lines be electrified. The petitioners expressed their willingness to agree to an increase in commutation fares in order to secure the improved facilities.

President Davis in his statement said:

This matter of the electrification of the suburban lines of the Lackawanna has been the subject of much speculation and discussion on the part of our patrons and communities for a long time; it also has been accorded consideration by our board, but the present service is thoroughly dependable, operates with clock-like precision and the cost mounted so high that, considering the gradual loss of traffic to other forms of transportation that come and go, the increased cost of performing service and the everlasting pressure to reduce rates here and there placed us in a position where we were unable to imagine an increase in traffic or a reduction in expenses of sufficient proportions to enable the railroad to get its money back. Obviously,

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therefore, we have been rather cautious about incurring such a burdensome obligation.

The committee expressed the opinion that the importance of this project was so outstanding to their communities that those whom they represented would be willing to pay increased commutation fares in order to secure the advantages of such improvement in transportation facilities, and placed themselves on record agreeing to co-operate with the railroad in securing an increase in commutation fares. Under such circumstances our board has authorized the project.

Some conception of the far-reaching significance of the change and what is involved can be gained when one contemplates that while the construction of many of the present suburban cars is such that they can be altered to fit the new operating conditions, about 100 of these cars which are now in good condition and serviceable for a long time to come will have to be replaced with others of special design; that about 75 perfectly good locomotives which are now in splendid condition but shall have to be replaced, are not readily salable and in all probability, will be reduced to mere scrap value; also that engine houses, coal-handling plants, water stations, ash pits and other railroad paraphernalia almost without end, incident to steam operation, shall have to be dismantled.

The railroad owns both land and water rights along the Hackensack River and has ample quantities of excellent steam coal readily available to its lines. Officials of the company are carefully weighing the advantages and relative cost of purchasing electric power from outside companies as compared with the construction of a generating plant and manufacturing its own power. The construction and equipment of a power plant of capacity sufficient to meet the railroad's needs will cost about $4,250,000.

The work of construction will be handled by an electrical committee of the Lackawanna, appointed by President Davis, consisting of Vice-President and General Manager E. M. Rine, chairman; Chief Engineer G. L. Ray; Electrical Engineer H. M. Warren; General Superintendent E. B. Moffatt; Superintendent of Motive Power and Equipment C. J. Scudder, and Superintendent R. M. White, with the advice and assistance of Jackson & Moreland, well-known consulting engineers.

Construction work will be started just as soon as the Lackawanna engineers can prepare plans, and it is estimated that it will be completed within two years.

Pass Tickets for St. Louis Employees

The St. Louis Public Service Company, St. Louis, Mo., has recalled all of the old employees' badges issued by the United Railways and is now issuing to each employee a pass ticket good for 104 rides. Tickets must be presented to the conductor for punching, and when used in full additional tickets may be obtained from the various department heads. Trainmen, when using the tickets, must also present their badges.

To Make "Safe Workers"

The *Safe Worker* will be published each month, beginning in May, by the National Safety Council for distribution to employees. Stories, jokes, helpful hints, poems, a calendar and a space for a record of time will appear in every issue. The purpose is to keep safety alive in every plant year in and year out. The schedule of prices per month is as follows:

Copies	Each in cents
25 to 100	4
101 to 500	3½
501 to 1,000	3
1,001 to 3,000	2½
3,001 and over	2¼

For instance, delivery on the June issue cannot be made unless the order is received before May 20. There are no transportation charges up to 1,000 copies—larger quantities f.o.b. Chicago.

Bill to Curtail Powers of I.C.C. Over Railway Extensions

Advocating that the Interstate Commerce Commission be divested of the power to require a "certificate of public convenience and necessity" from railroads and electric railways desiring to make extensions, Representative Abernethy, Democrat of North Carolina, has asked Congress to amend the interstate commerce act. The measure is similar to one introduced in the Senate in December by Senator Simmons.

The presentation of the measure is an outgrowth of the recent refusal by the I.C.C. to grant permission to the Piedmont & Northern, an electric line, operating in the Carolinas, to extend its lines, after a hotly contested argument in which the Piedmont & Northern maintained that the I.C.C. did not have jurisdiction.

Representative Abernethy pointed out to the House that state officials, including the Governors and the railroad commissions of the two Carolinas; civic organizations and shippers had asked the I.C.C. to approve the application, while the only opposition came from competing railroads.

In referring to the I.C.C. decision, he said:

> Such power as has been exercised by six men who rendered the decision could not have been contemplated by the most ardent supporters of the interstate commerce act. No one could have dreamed that the men chosen by the President of the United States and confirmed by the Senate to carry out the mandate of Congress would ever have exercised such power as is evidenced by the decision in this case.

He declared that the Piedmont & Northern had never been treated by the I.C.C. as a railroad subject to the valuation act; that it is governed by the accounting rules laid down for electric railways; that on Oct. 12, 1920, the I.C.C. ruled that the Piedmont & Northern was not subject to the transportation act of 1920, relating to the issuance of securities, and that the Railroad Labor Board had ruled the Piedmont & Northern was an electric interurban line not operated as a part of a railroad system. He declared:

> To put this matter in plain and simple language, we find a commission here in Washington which by vote of half of its membership denied to two sovereign states the right to have constructed strictly within the borders of their states an extension of an electric railway.

Increased Rates in Joplin

A ruling of the Missouri Public Service Commission delivered April 20 grants increased rates to the Southwest Missouri Railroad in the city of Joplin. The increase is from the present fare of 5 cents for adults to 8 cents for a single adult fare, with two token fares for 15 cents. Under the ruling the company is entitled to charge the increased fare for a trial period of thirteen months.

Testimony taken in the hearings showed during the period from Sept. 15, 1926, to Aug. 31, 1927, that the company had suffered an operating loss on its Joplin lines of more than $20,000.

Rehearing Sought by City on Pacific Electric Rate

The city of Los Angeles, Cal., through Jess E. Stephens, city attorney, has petitioned for a rehearing of the California Railroad Commission's recent order fixing rates for the Pacific Electric Railway in Los Angeles and points in southern California. It is alleged that the rates fixed by the commission are discriminatory and unfair as between the patrons of interurban lines and those of the local system, for the reason that interurban fares have been reduced and increases on the local system have been granted, notwithstanding the rate of return upon the capital investment on the local system has been comparable with the same on the interurban lines.

Seventy-Cent Top Rate in Pittsburgh

A settlement of the trainmen's wage scale agreement between the Pittsburgh Railways, Pittsburgh, Pa., and the Amalgamated Association has been reached. In consequence it has been announced that, effective May 1, trainmen will receive an increase of 1½ cents an hour. This brings the maximum rate to 70 cents. On Jan. 1, 1927, an agreement was reached whereby the wage rate of trainmen was increased 1½ cents.

Trainmen have been on a maximum rate of 68½ cents an hour with a starting rate of 61½ cents. Effective May 1 for a period of two years, the time of the contract, the starting rate will be 63 cents. After the first three months the hourly rate rises and the maximum rate is reached at the end of the first year.

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Rapid Transit Before St. Louis Board

Rapid transit was brought before the St. Louis, Mo., Board of Aldermen as a paramount issue at the first meeting of the 1928-29 session of the board on April 17, when Mayor Miller and Alderman Sam Wimer both presented bills calling for the creation of a rapid transit commission. Mayor Miller's bill differs in several material points from the measure filed at the last session of the Aldermen. The chief point of difference is that the new bill provides the city shall appropriate $50,000 for use of the commission in making a transit survey, while the old measure provided among other things that the St. Louis Public Service Company should reimburse the city to the amount of $100,000 to be used in the survey.

Furthermore the new bill gives the railway only one non-voting member on the commission while the other bill provided the company should have three voting members. The new commission would have sixteen members, including representatives of the City Plan Commission and the State Public Service Commission and not more than seven private citizens. All members would serve without pay and the life of the commission would be two years. The commission would study all phases of transportation, general street and highway plans and related matters.

Mr. Wimer's measure provides for only $6,000 for clerical and incidental expenses of the commission he would create. His commission would include the Rapid Transit Committee of the aldermanic board and six citizens to be named by the Mayor.

Unanimous approval for a rapid transit system was expressed by leading business men at a recent public hearing.

Tax Relief Sought by Danville Company

The Danville Traction & Power Company, Danville, Va., is seeking an amendment to its local franchise and relief from the tax required for the use of the city streets. At present the company pays the city 1 per cent of all gross receipts up to $40,000 and one-half of 1 per cent thereafter. Waning public patronage and the heavy blow dealt the Danville company on account of curtailment of the Danville textile mills are advanced as reasons for tax relief.

Mayor Wants Fifteen-Year Boston Extension

Mayor Nichols of Boston, Mass., appeared before the House Ways and Means Committee at the State House recently and explained his bill for the continued public control of the Boston Elevated Railway. The bill provides for a fifteen-year extension of public control, the creation of a board of five public trustees, of whom three shall be appointed by the Governor of Massachusetts and two by the Mayor of Boston. The Mayor said he did not care to control the board, but felt it was a big program and the city had considerable interest in it.

Mayor Nichols explained that he had not included in the bill any provision for the purchase of the common stock of the company because, he said, he did not want to load it down with too many controversial matters. While it was Commissioner Eastman's idea that the state could buy the common stock, little by little, the Mayor felt the state was not quite ready for such action.

It is provided in the Mayor's bill that all the subway leases, the old ones as well as the new ones, should be made to expire in 1953. The old ones are dated to expire in 1936. But the Mayor would not agree to the suggestion that the subways should be operated free of rentals after the bonds had been paid. He said the rental money after that date could be applied to extension and improvement of service.

The new bill also provides that if the stockholders of the Boston Elevated do not accept this measure the secretary of the commonwealth shall give notice to terminate public management and operation of the property. The Mayor said the time had come when this matter should be settled, and now was a good time to end the controversy.

"U" Turns Prohibited in Chicago Loop

Passage on March 29 by the City Council of a new ordinance prohibiting mid-block or "U" turns in the Loop district, in the opinion of traffic officials of the Chicago police department, will give Chicago the most efficient and fastest movement of heavy street traffic in any city in the country. The new ordinance must be signed by the Mayor before it can become effective. It was bitterly opposed at the public hearing stage, by taxicab companies regarded as the gravest offenders.

Let Us Be Fair!

A FEW days ago the California State Railroad Commission granted a permit to a bus line to operate in direct competition with one of the beach lines of the Pacific Electric Railway. Without regard to the merit of this particular proposition, it should be said that the general policy enunciated in such permits amounts to subsidizing competitors of railways and that in principle it is unfair and inequitable.

The railroads are California's heaviest taxpayers. . . . On the other hand, the bus lines pay almost no taxes at all. . . . California owes a tremendous part of its development to the railroads; without them much of its area would still be ranches and desert, sparsely settled and almost unproductive. . . .

Even this does not tell the whole story. If the railroads had been treated like ordinary private businesses in the past, allowed free sway in setting their own prices for the services they render, they would have no ground for complaint if another agency succeeded in obtaining the business. But they were not given a free hand; their fares have been regulated, their earnings restricted even while their taxes rose; they have not been allowed to accumulate a fund which might now be used in protecting themselves in a competitive rate war. This is no argument against public regulation; it is an argument showing that if the state does regulate, it is in duty bound to protect. It has limited railroad earnings on the ground that railroads are a natural monopoly; the plain corollary is that this recognized monopoly should not be interfered with artificially and without compensating grants.

The *Times* holds no special brief for the railroads. It has had several hard battles with them in the past, outstanding examples being the fight for a free harbor at San Pedro and the fight for a union station at the Plaza, in both of which most of the other newspapers of the city took the railroads' side. It has consistently opposed the railroads when it believed them wrong, and just as consistently it has been for them when it believed them right.

It believes now that this whole matter of bus competition with the rail carriers needs to be taken up and settled according to the plain principles of equity and justice, and that the railroads should be given just as fair treatment as the public they serve.—Los Angeles *Times*.

Decision Against Non-Paying Extension in Cincinnati

Cincinnati's City Council voted seven to two, on April 18, against extension of the Warsaw Avenue line of the Cincinnati Street Railway to the Westwood car line, in order to serve pupils of the new Western Hills high school. Representatives of the railway said this was only the first of many similar extensions sought by residents of various sections, which, if undertaken, would tend to cripple the company. Parents of high school students in the district, on the other hand, said that without an extension their children would have no means of transportation to the school. Establishment of a bus line now is contemplated.

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Free Window Display for Market Street Railway

Car card and newspaper messages have long been accepted as good mediums for electric railway advertising but out in San Francisco, Cal., window display as a medium goes even further. It pays for itself. As a result of a display at Christmas time by the Market Street Railway several locations are now open to the company to exhibit under similar arrangements with rental free.

In December, 1927, the Market Street Railway had an attractive exhibit in readiness and no place to show it. Several realtors and building managers had stores for rent in good locations so the railway sold an enterprising real estate firm on the idea that a decorative window would win a prospective tenant more readily than an empty window in an unlighted store. Removal on notice was satisfactory to both parties.

In accordance with the plan at the Holbrook Building, 58 Sutter Street, the week before Christmas the display, neat and attractive, was opened and the company was permitted to install large flood lights, paying for the current but no rent. There were Christmas trees, red crepe paper, tinsel and the like, model of a new car and samples of some of the 750 street car parts made by the company ranging from trolley wheels to door handles all in the natural brass. Practically every part of the city and many important events of recent date were represented in pictures. People paused for as long as half an hour in an effort to identify the different scenes portrayed.

The same general idea was carried out in a later display except that the trimmings were in deep blue. When the next move is made nine smaller models portraying the development of railway transportation in San Francisco will be added. These will include an early type of horse car, known as a balloon car because of its circular body, a steam tram, the first cable car in the world and thus down to the California Comfort Car of 1925. The exhibit appears to be destined to travel through all parts of the city in choice locations.

Higher Fares on Hydro-Electric Lines

A new schedule of increased fares became effective on the lines of the Hydro-Electric Railways in Windsor, Canada, on April 15. The new schedule calls for four tickets for 25 cents, or a straight 7-cent fare instead of a straight 6-cent fare, or twenty tickets for $1. The joint transportation board, representing the several communities affected, has stipulated that the old schedule must be resumed on Oct. 31. This board, at the instance of Alderman Clyde Curry, demanded nine tickets for 50 cents.

The Hydro-Electric Power Commission, which operates the railway, has reported a $75,000 deficit, but the Mayors and Aldermen of the various municipalities claim that the increased fare should make this up by the end of October. According to newspaper comment the persistent criticism of the service in the past year, coupled with the new rate, has resulted in a demand for local control of the border lines, instead of control from Toronto.

Indiana Papers Boom Interurban

The two newspapers at Boonville, Ind., have been running a series of articles urging the people of that section to be more liberal in their patronage of the Evansville, Suburban & Newburgh Railway, which operates from Evansville to Boonville and Newburgh, Ind. They urge the business men to ship freight by the railway instead of the trucking lines that operate along the state highway between Evansville and Boonville. The Boonville Business Men's Association has repeatedly urged the merchants to patronize the railway, pointing out that the trucking companies pay no taxes in Warrick County.

The Clangor of Jacksonville's Varicolored Car

PROBABLY some time today you'll meet *it*. *It* may be placidly waiting for the "go" signal at Bay and Main Streets, or *it* may be ambling squat and heavy and contentedly on St. Johns Avenue. Sooner or later you'll cross *its* trail. *It's* a street car.

Yes, sir! A street car. But *such* a street car. Never before in Jacksonville's history and, in all probability, never before in the history of any Southern city has such a car raised its clangor.

Red and white and blue and gray and brown and green—the colors of the spectrum were overtaxed in the phantasmagoria of shadings decreed by the Jacksonville Traction Company for its vehicles henceforth.

For several days *it* has stood in the carhouse of the company, a gayly colored thing awaiting the drop of the barrier to race forth upon the streets. Unlike the company's new Murray Hill buses, *it* has no name.

It is an experimental paint job. If Jaxons see *it* and are not stricken suddenly blind the company will give it a brother in brilliance and a sister, and a papa, and a mama, and a whole flock of bedaubed uncles and aunts.

Lest Jaxons suffer from the monotony of street car colors in the future, and the company officials, directed by a sudden welling up of futuristic impulses, have no desire that they should, all *it's* relatives will wear different garbs in different ways.—*Jacksonville Journal.*

Conferences on Wages in St. Louis

A deadlock has been reached in the negotiations between officials of the St. Louis Public Service Company, St. Louis, Mo., and its 4,500 employees relative to a new wage scale and working agreement for members of the Amalgamated employed by the company.

Recent developments are the rejection by the workers of the company's counter-proposal that the carmen, maintenance workers and shops crafts accept an average reduction of 10 per cent in wages, and a recommendation to be made to the board of directors of the company that notice of termination of the existing contract be served on the union. The later action was decided upon April 24, following a conference between company officials and a committee from the union at which the decision of the workers in rejecting the company's proposal was reported to the company. The contract proposed to the union by the company was identical with the existing contract except that it called for a decrease in wages to the scale in effect before the increase in 1923. Thirty days notice for terminating the existing contract is required.

Last December after the St. Louis Public Service Company took over the properties of the United Railways the union announced it would seek a new sixteen-months agreement. Subsequently wage increases of 5 cents an hour for the 3,500 platform men and increases up to 10 cents an hour for the 1,000 maintenance men and shop workers were asked. The union has also asked that 65 per cent of all runs be made straight runs to be completed within nine hours. In addition the union wants one-man cars abolished and the period of maximum seniority reached at the end of one year instead of three years.

At present the conductors and motormen receive from 50 to 67 cents an hour, while wages of other workers range from 45 to 81 cents an hour. The increases asked by the union would total about $450,000 annually.

"Copy" Wins Prize in Augusta

A $10 gold prize was won recently by D. J. Roberts, a member of the senior class of the Academy of Richmond County, Augusta, Ga., for copy for an advertisement submitted for use in the space of the Augusta-Aiken Railway & Electric Corporation in the *Musketeer*, the school paper. The subject was "Conservation of Their Equipment." The corporation offered the prize to check student marauders who frequently damage cars.

The winning essay called attention to what the railway was doing generally toward progress and prosperity in the south, and particularly for the students, by offering of special rates to them. It urged all to protect the vehicles and to prevent anyone from damaging property of the company.

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Recent Bus Developments

Trial Franchise Suggested in Kansas City

A trial franchise to run either four or six months may be the solution to the bus problem of the Kansas City Public Service Company, according to the City Council members.

Despite the fact that the present franchise does not expire till June, a proposal of this kind will probably be made to the Council soon in order that the Council may have ample opportunity to study the proposition made in a recent report by Powell C. Groner, president of the company.

As noted in ELECTRIC RAILWAY JOURNAL for April 14, page 631, changes in routes and a 15-cent fare on downtown routes were included among Mr. Groner's proposals. He does not want the car rider penalized for bus deficits. Asked regarding the report, Mr. Groner stated:

> After a long study of the matter, we believe we have set out the bus situation in our report and we suggest in the report that the city fix a trial period for testing our findings.

New Key System Service Authorized

The Key System Transit Company has been authorized by the California Railroad Commission to operate bus service between the City Hall in Oakland to the intersection of Webster Street and Santa Clara Avenue in Alameda. Before beginning the proposed service the company will be required to submit the complete route to the commission for its approval. Permission is also granted to the company to discontinue its present railway service on Webster Street and over the Webster Street bridge in Alameda upon the installation of the proposed bus service. In its decision the commission suggested that the company should provide transportation for the needs of the fast growing city of Oakland, to the north and to the east, instead of confining the proposed service to Broadway and Washington Streets and the area between Twelfth and Fourteenth Streets.

Joint Coach Service in Los Angeles Territory

An application has been filed by the Los Angeles Railway and the Pacific Electric Railway, both of Los Angeles, Cal., with the Railroad Commission for authority to operate under the name of the Los Angeles Motor Coach Company, coach service between Fifth and Hill Streets in the city of Los Angeles to the intersection of Wilshire Boulevard and Santa Monica Boulevard in the city of Beverly Hills. It is proposed to operate this service in conjunction with a shuttle motor coach service for the transportation of passengers between Wilshire Boulevard and La Brea Avenue and the intersection of La Brea Avenue and Edgewood Avenue in the city of Los Angeles. When the proposed through service is started separate coach services now operated over these lines by both companies will be discontinued.

Proposed Purchaser Would Replace Poughkeepsie Railway

John B. Marian has announced that he is ready to purchase for cash the real estate, rolling stock and franchise of the Poughkeepsie City & Wappingers Falls Electric Railway, Poughkeepsie, N. Y. His plan is to offer to passengers a service by which, if they live off the seven established trunk lines, they would be brought to their doors for an additional 10 cents. The initial fare would be 10 cents. This presupposes substitution of buses and taxis for the railway.

Bus Control Asked by I. C. C.

Congress gets recommendation for joint United States-local regulation differing slightly from Flynn report. Reservations made by Commissioner Woodlock

FEDERAL legislation setting up a co-operative system of state and national regulation over motor bus operations on highways was recommended to Congress on April 21 by the Interstate Commerce Commission.

At the end of a prolonged investigation the commission adopted a report presented by Commissioner Esch, which declared that motor transportation had became "a well established and useful factor of the nation's transportation system" and that the development had been sufficient to require a regulatory system in the public interest.

At the same time the commission held the transportation of property by motor truck at the present time should not be made the subject of interstate regulation. The control proposed was recommended almost exclusively to passenger transport by motor bus lines.

Under the system proposed, state regulatory bodies would assume primary jurisdiction over the lines, acting in conjunction with each other through joint boards on which the Interstate Commerce Commission would be represented. In any state where state authority failed to appear, the Interstate Commerce Commission would assume power.

Railroads should be authorized to undertake motor operation, and all operators intending to undertake service should be required to obtain certificates from the regulatory authorities to the effect that public convenience and necessity required their service.

The report also suggested that joint rates between railroad and motor lines should be permitted, and that rates for highway transportation should be made subject to regulation, while free transportation by passes should be forbidden to bus lines as they are now forbidden to railroads.

The report closely follows the recommendations by the commission's Attorney-Examiner, Leo J. Flynn, in his tentative report issued several months ago. In general both the commission's recommendations and the examiner's report propose regulation similar to that incorporated in the Parker bill (H.R. 12380).

The principal point of difference between the tentative report and the commission's final one is the omission of regulation for trucks from the latter. In this connection the commission says:

> While experience may show that the interstate transportation of property by motor vehicles operating as common carriers on the public highways should be regulated, there does not appear to be at this time public need therefor.

It is recommended, however, that interstate truck operations by carriers subject to the interstate commerce act should come under the provisions of the act. This would not apply to operation through subsidiary companies.

With respect to bus regulation the commission has made a number of changes from that of its examiner. Mr. Flynn's belief that bus operation by railroads should come within the provisions of section 15a of the interstate commerce act in determining net railway operating income is not completely shared by the commission, which thinks that possibly they should be excepted. Moreover, the commission would move up the date in the grandfather clause to one year before the opening of the session at which the law is passed, instead of March 2, 1925. Operation on such date would be *prima facie* evidence only of convenience and necessity.

As indicated previously joint rates between railroads and motor carriers would be authorized, subject to the provisions of the interstate commerce act, but the commission believes that such rates should not be required. It also believes that interstate motor carriers should be required to extend their routes if necessary in addition to furnishing more service on the same route, if needed.

Commissioner Flynn's recommendation that small carriers be exempted from regulation, at the discretion of the body in charge, is abandoned in favor of counsel to the effect that broad discretion with regard to classification of companies be allowed, but no exemptions should be permitted from provi-

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sions relating to certification, liability, insurance and rates of fare.

Commissioner Thomas F. Woodlock of New York concurred in the report but made a note of his reservations in which he said:

Regulation is not in itself a good thing. The less regulation that is necessary, other things being equal, the better for the community. It is necessary in the case of public service utilities because of their semi-monopolistic nature. Transportation in general is not *per se* of such nature; transportation by railroad is. Transportation by motor bus and motor truck does not necessarily depend upon monopolistic or semi-monopolistic organization or performance.

It is manifest that at the present time these services are much more largely of a competitive than of a monopolistic nature. For that reason the need for regulation—except in so far as concerns the public safety—is not wholly clear. This being so regulation should proceed with caution and only in response to demonstrated needs.

A digest of Examiner Flynn's original report, together with the recommendations he made, was presented in ELECTRIC RAILWAY JOURNAL for Jan. 21, 1928, page 136, and the statements by witnesses at the hearing before the committee on interstate commerce on the Parker bill were noted in the issue of April 21.

Would Run Buses on New Hampshire Line

The Chester & Derry Electric Railway, Chester, N. H., has petitioned the Public Service Commission of New Hampshire for authority to substitute bus service for railway service between Chester and Derry.

Oklahoma Commission Hears Interstate Bus Petitions

Members of the Oklahoma Corporation Commission conferred recently with representatives of the Oklahoma Bus and Truck Operators' Association and decided that it would assume jurisdiction over all interstate bus operators under the police powers of the state, providing other existing laws do not confer jurisdiction. Hearings are being held on several applications before the Oklahoma Commission for certificates of convenience and necessity to operate interstate buses into and through Oklahoma.

Partial Substitution in Glens Falls

A declaration of abandonment by the Hudson Valley Railway of the South and Knight Street lines, the depot line and the belt line, all in the city of Glens Falls, was approved by the Public Service Commission on April 12. Decision was deferred on the company's petition for approval of abandonment of two other parts of its system, the Fort Edward-Thomson line and the Northumberland-Stillwater line. The railway would substitute bus service in Glens Falls.

Rail-Bus Service in Seattle Suburb

To provide improved transportation to the large suburban district of Green Lake, Wash., a combination bus and street car service will be installed as soon as new buses can be purchased and made ready for operation. The City Council utilities committee has approved a plan recommended by Superintendent of Seattle Municipal Railways, D. W. Henderson whereby a new bus line will be started, the bus operating north on West Green Lake Way and south on East Green Lake Way. Under this plan persons living east of the lake will ride the bus to Winona Avenue, on trips downtown where they will transfer to inbound Green Lake cars. On returning they will use the street cars to their destination. Persons living on the west side of the lake will use the street cars on trips downtown. On their homebound trips, they will ride the cars to Woodland Park Avenue and North 55th Street, where they will transfer to a north-bound bus.

De Luxe Suburban Transit Out of Newark

Rapid progress is being made by Public Service Co-ordinated Transport, Newark, N. J., in the development of one of the latest phases of bus transportation—suburban transit by a high type of bus, designed to give additional riding comfort. The company has put many high-speed motor coaches of the latest improved models into service. They run in and out of Newark over various routes with termini at Paterson, Hackensack, Montclair, Jersey City, Elizabeth, Plainfield, the Oranges, Maplewood and Morristown. The purchase of the bus business of the Morris County Traction Company enables Public Service to operate as far as Lake Hopatcong and to points as far north as Sussex County. No local lines are included in this service.

Buses Supply Service Over Abandoned Railway Route

Since suspension of railway service by the Centre & Clearfield Railway, Johnstown, Pa., last August the Philipsburg Motor Bus Company has been supplying service in Philipsburg and connecting Philipsburg, Grassflat and Winburne. Loss of patronage due to greater use of automobiles resulted in decreased revenues and led to the abandonment of the railway.

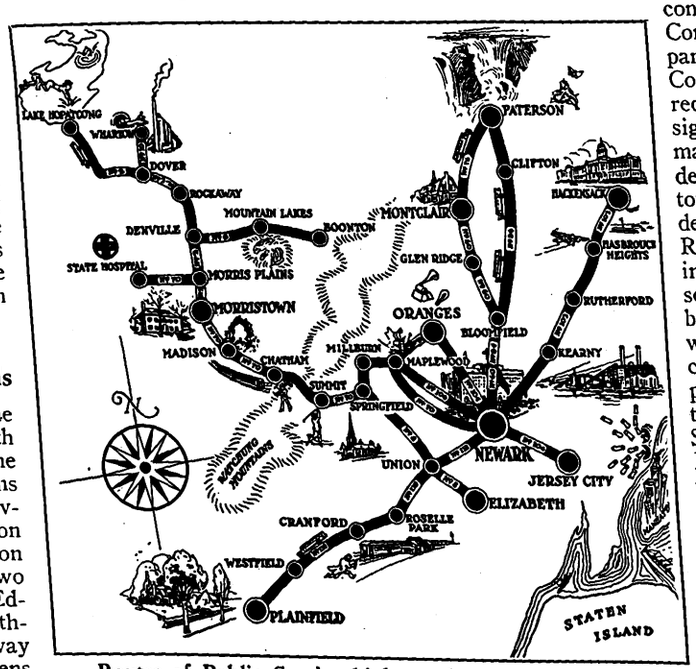
Bus Makes Good Showing in Springfield

A. D. Mackie, general manager of the Illinois Power Company, Springfield, Ill., and W. J. Hagenah, utilities expert, engaged by the company, testified before the Illinois Commerce Commission recently that buses operated in Springfield are netting sizable profits while the street cars are operating at a loss. The company has petitioned for increased railway fares in Springfield. Buses, representing a net investment of $130,826, are showing a gross income of $140,000, while electric railway traffic has fallen from 11,178,985 in 1926 to 10,616,856 in 1927. According to statements made to substantiate the contention of the company for a fare increase, a return of only 1.9 per cent is shown upon the railway investment.

Extensions Planned in Hartford

Expansion of its bus service to augment present railway service and in some instances to replace it is being considered by the Connecticut Company in Hartford, Conn., which has received a petition signed by approximately 2,500 residents, for a cross-town bus line. Alderman John B. Riddell is sponsoring this projected service and has been in conference with officials. The company is also planning a bus line to replace the Farm School railway line. It is planned to continue railway service from Hartford to Rockwell Corner via Blue Hills Avenue.

This is merely another move toward greater coordination of the services.



Routes of Public Service high-speed motor coaches into the city of Newark

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Financial and Corporate

Washington Merger Plea

Any opposition by Congress to proposed consolidation of District of Columbia properties likely to center around $50,000,000 valuation

THE merger of transportation companies of the District of Columbia, as provided in the Zihlman resolution, was explained to members of a subcommittee of the House Committee on the District of Columbia on April 20 by John W. Childress, chairman of the Public Utilities Commission.

The agreement of the companies, which was made voluntarily upon the suggestion of the commission that an effort be made to find the basis for unification, Mr. Childress said, was reached upon the understanding that the rate-making valuation for the new company would be $50,000,000.

Harrison Brand, Jr., on April 23, reiterated a previous statement that he regarded as "fair and just" the valuation of $50,000,000.

The companies receded from their original view that the valuation should be $62,500,000, Mr. Brand said, because of the delay which would result if the commission had made a detailed valuation examination of the properties of the Washington Railway & Electric Company. Mr. Brand expressed the opinion that an exhaustive inventory of the company's properties would disclose a value which would bring the total for the two companies above $50,000,000.

As the investigation progresses it is becoming evident that Congressional opposition to the unification plan will center around the $50,000,000 valuation figure approved by the commission. It developed during the examination of Colonel Brand, engineer member of the commission, by Representative Gibson of Vermont on this subject that the latter had been making a study of valuation disputes in cities which had either taken over transportation lines or arranged for service-at-cost agreements.

In his reference to the fact that no depreciation had been deducted from the valuation of the property of the Capitol Traction Company, Mr. Gibson cited the case of Detroit. He said:

When the city undertook to take over the company in this Michigan city it was found that the valuation of the properties was $31,500,000. The properties were actually taken over at a figure $9,000,000 less than this amount. In Seattle the railway lines cost the city $15,000,000 although a subsequent valuation placed this value at $8,000,000.

He also referred to methods used in Milwaukee and Grand Rapids to arrive at a valuation for operation at service-at-cost, which he said proved the need for accurate depreciation deductions. He then said:

So far as I have been able to ascertain the depreciation by any method used is far in excess of what you have allowed for the purpose of this merger. Why should the situation here be any different? Do you think that these roads are kept in any better condition?

Mr. Gibson made it plain that the paving tax is "the fixed policy of Congress, which was decided upon by 500 representatives of the people.

During this discussion reference was made to a list of cities, compiled by the A.E.R.A., that have freed the railways from paving burdens. Mr. Gibson indicated that the A.E.R.A. would naturally be biased in this matter.

Montreal's Ticket Fund Considered at Annual Meeting

At the annual meeting of shareholders of the Montreal Tramways, Montreal, Que., on March 30, Julian C. Smith, the president, touching on the matter of the unredeemed ticket account, stated that the disposition of this fund had been the object of a dispute between the city and the company for some time, and that finally an agreement had been reached whereby $500,000 was taken as sufficient to meet the company's liabilities as regards unredeemed tickets. A sum of $621,206 was transferred to earnings, and, since all of the contract requirements had been satisfied, this sum constituted divisible surplus and was divided so that the city obtained 30 per cent, the company 20 per cent, while 50 per cent was transferred to the tolls reduction fund. Mr. Smith expressed gratification over this adjustment.

Another Offer for British Columbia Electric Railway

Reports continue to increase with respect to offers for the purchase of the British Columbia Electric Railway, Vancouver, B. C. The latest bid is from the Power Corporation of Canada, through A. J. Nesbitt of the Nesbitt, Thomson Company of Montreal. This overture is on the basis of $57,500,000 for the property. The Lord Rothermere group bid £240 and £280, respectively, for the preferred ordinary and deferred ordinary shares. Nesbitt's first bid was £266 and £306, and Holt's bid £272 and £312. Mr. Nesbitt's second offer to directors of the railway read in part as follows:

We offer to purchase all preferred, preferred ordinary stock and deferred ordinary stock and shares of the company at the following prices: preferred ordinary, $1,330 per $500 nominal; deferred ordinary stock, $1,530 per $500 nominal of stock and shares, and so, in proportion, for smaller amounts on the following conditions:

We agree to buy and you agree to recommend all other preferred ordinary and deferred ordinary stock and shareholders to sell to us their stock and shares at the same price and on the same conditions. There will be no alteration of the articles of association or special rights attached to shares and stocks between April 19 and date of completion, May 31, 1928, or a later date, if mutually agreed on. This offer is conditional on the acceptance by not less than 75 per cent being lodged with us before May 10, 1928, or a mutually agreed date.

Situation in Baltimore Revealed

Annual report of United Railways shows falling off in transportation revenue. Net income $535,364 without certain allowances

A NET income of $535,364 was realized by the United Railways & Electric Company, Baltimore, Md., for the year ended Dec. 31, 1927. In the Baltimore *News* of April 11 President Emmons in a full-page message to the people states "approximately 29/30ths of the entire amount collected on the street cars of Baltimore was promptly paid out again in 1927 in wages, taxes, interests on borrowed money and cost of materials, the balance of 1/30th only remaining for stockholders and surplus."

At the annual meeting held on April 11 an amendment to the charter of the company permitting the issuance of preferred stock and the sales of convertible securities was adopted. The president said this action had no significance at the present time.

In the twenty-ninth annual report, that for the year ending Dec. 31, 1927, the earnings and expenses were as follows:

STATEMENT OF EARNINGS OF BALTIMORE COMPANY

Total operating revenues		$16,188,668
Operating expenses	$9,987,005	
Taxes assignable to railway operation	1,575,938	
		11,562,944
Operating income		$4,625,724
Non-operating income		165,656
Gross income		$4,791,380
Fixed interest on mortgage bonds and rentals		2,309,821
Remainder		$2,481,559
Other deductions from gross income:		
Interest on unsecured funded debt	$376,284	
Interest on income bonds	559,080	
Interest on unfunded debt	84,757	
Amortization of discount on funded debt	67,901	
Miscellaneous	48,737	
		1,136,760
Net income		$1,344,798

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Out of $1,344,798, $809,433 was credited to reserve for depreciation, the remainder being transferred to surplus from which dividends of $818,448 were paid. In order to do this and to cover other necessary adjustments, the company's surplus was reduced from $2,020,863 to $1,588,822.

The company filed application for an increased fare in July, 1927. The case was finally decided Feb. 10, 1928. The fare was increased to 9 cents flat, 3 for 25 cents. The company has applied to the courts for a flat 10-cent fare.

Following are the results for 1927 compared with those of 1926:

COMPARATIVE INCOME STATEMENT OF BALTIMORE COMPANY

	1927	1926
Revenue from transportation	$16,043,932	$16,571,545
Other revenue	144,736	144,163
Total operating revenues	$16,188,668	$16,715,709
Operating expenses	ϕ$9,987,005	$9,955,019
Depreciation	809,433	835,785
Operating expenses and depreciation	$10,796,439	$10,790,804
Taxes assignable to railway operations	1,575,938	1,672,316
Total operating expenses, depreciation and taxes	$12,372,377	$12,463,121

ϕIncludes increase of 2% in wages to employees.

Ratio of Operating Expenses to Operating Revenues:

	1927 Per Cent	1926 Per Cent
Operating expenses	61.69	59.55
Depreciation	5.00	5.00
Operating expenses and depreciation	66.69	64.55
Taxes assignable to railway operations	9.73	10.00
Total operating expenses, depreciation and taxes	76.42	74.55

It is estimated by the company that there are approximately 18,000 to 20,000 owners of its bonds, the largest bond issue, representing about three-eighths of its total issues, being held by about 5,000 owners. All the banking capital of Baltimore, the report says, added together, does not equal today the market value of the company's outstanding securities, even at depreciated values.

"Failure to protect this vast investment," it is stated, "owned by so many of our people, will not only affect the community's welfare, but if the faith of these investors in the credit and stability of the company is lost, it is obvious that the company will have nowhere to turn to secure money with which to serve the public in the future. How will new cars be purchased, new rails laid, new electric stations built? Destroy credit and in a short time service dies with it."

In the report Mr. Emmons said that in 1926 there was some evidence that the use of private automobiles for transportation to and from business had reached its peak—gross receipts of the railway had started to pick up a little. In 1927, the trend had begun the other way; receipts began to fall off rapidly in the spring of 1927, and by July it had become evident that the company could no longer continue to operate with a 7½-cent fare.

The Baltimore Coach Company controlled by the company now owns 108 buses. Its total mileage during 1927 was 2,113,819 bus miles and its revenue showed an improvement. Reconstruction of track during the year covered 14½ miles. Reconstruction in the past nine years totaled 146.3 miles.

Rockford Railway Lines Pass to Chicago Interests

The Rockford Public Service Company, Rockford, Ill., and interurban properties operated by it have been sold to the Central Public Service Company, Chicago, which a few months ago acquired the Rockford Electric and Rockford Gas, Light & Coke companies. Adam Gschwindt, general manager of the latter two concerns, becomes manager of the railways also. The deal involved about $2,200,000. The price represents $1,700,000 paid eighteen months ago by T. M. Ellis, Jr., president and majority stockholder, for the lines, $316,000 spent on improvements and 10 per cent for intangibles.

The utilities involved in the sale are the Rockford city traction lines and feeder buses; Rockford, Beloit & Janesville Electric Company; Rockford & Freeport Interurban Company, the Roscoe Electric Company and the Rockford, Belvidere & Elgin interurban, owned by Mr. Ellis and B. J. Arnold of Chicago. When the railway lines went into receivership on Feb. 5, 1926, Mr. Gschwindt was named receiver and a year later Mr. Ellis bought in the properties.

Mr. Ellis retains ownership of the railway at Beloit.

Object to Suspension of Lincoln Interurban

The Omaha, Lincoln & Beatrice Railway, Lincoln, Neb., encountered stiff resistance before the State Railway Commission at the hearing on its application for permission to suspend service and take up its tracks. Patrons from the territory served claimed they had located in that section because of the car service, and business houses objected because the company held out that they would have permanent rail connection with the outside railroad world. It has been suggested that the road be leased to another operator and that service be reduced and that fares be raised.

City Attorney Peterson admitted that if the operation of the road resulted in capital losses its continuance could not be forced, but insisted that it had not been shown that the maximum fare at which persons would ride was being charged. General Manager Bramlette testified that the competition of Lincoln Traction Company buses and of privately-owned automobiles was constantly reducing the number of revenue passengers carried; that the truck had taken most of its package and carload freight movements and that it had lost its mail-carrying contract.

A total of $316,566 is now invested in the property. Total revenues last year were $42,695, while operating expenses were $56,439.

Change in Richmond Company's Capitalization

Directors of the Virginia Electric & Power Company, Richmond, Va., have been authorized to issue, in their discretion, $8,000,000 in first and refunding mortgage gold bonds. They have also been authorized to file with the State Corporation Commission an amendment to the company's charter so as to provide for an increase of $5,000,000 in 6 per cent cumulative authorized preferred stock.

It is regarded as likely that $3,000,000 in 6 per cent cumulative preferred stock will be issued this year to cover improvements and developments undertaken by the company to increase industrial power facilities in tidewater Virginia and northeastern North Carolina.

Rainier Line Puts Burden on Seattle Municipal

The problems of the Seattle & Rainier Valley Railway, Seattle, Wash., are adding to the financial difficulties that beset the city-owned railway line, Clark R. Jackson, superintendent of utilities, recently advised the City Council. He said that the Rainier Valley Company was in arrears $9,500 to the Seattle Municipal Railway for material purchased and for an amount due on a transfer exchange, with the sum increasing monthly. Moreover the arrears were increasing at the rate of $650 a month. Efforts to collect had met with explanations by the Rainier Valley officials that the company's financial condition precluded payment. The City Council appointed Councilmen Blaine and Erickson as a committee of investigation.

Loss in Fresno

The Fresno Traction Company, Fresno, Cal., reports to the Railroad Commission its 1927 operating revenue at $324,071, compared with $334,087 in 1926. Operating expenses, excluding taxes for 1927 were $313,268 and for 1926, $318,678. During 1927 tax charges were $19,729 and in 1926 $18,769. The gross corporate income representing the amount available for interest, amortization of debt discount other fixed charges, non-operating expenses, dividends and surplus was a loss in 1927 of $15,908, compared with a loss in 1926 of $10,382.

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Net Income on Interurban $253,946

Texas Electric Railway reports decrease in operating expenses in 1927. Cost of improvements higher. Service better. Recommendation for amended charter

GROSS earnings of the Texas Electric Railway, Dallas, Texas, for the year ended Dec. 31, 1927, were $1,867,063 compared with $2,038,713 for the preceding year. These earnings for the two years named were made up from the following principal items:

	1927	1926
Passenger	$1,536,342	$1,692,142
Mail	26,521	26,827
Express	249,520	258,279
Rents of tracks and terminals	25,770	32,005
Rents of buildings and other property	13,549	14,395
Miscellaneous	15,357	15,062

The net income after charges but before depreciation was $253,946 compared with $250,769 for the year 1926. These facts were contained in the annual report submitted to the stockholders.

Operating expenses for the year totaled $1,123,169 compared with $1,260,393 for 1926. Included in this decrease is an allowance of $52,500 made to the company by the Texas Power & Light Company upon power bills for the year. Included in the operating expenses for the year 1926 was a similar allowance of $15,000. Taxes assessed against the company for the year 1927 were $70,776 compared with an assessment for the previous year of $99,725. Through an act of the State Legislature, effective June 14, 1927, the tax upon the gross receipts of interurban and street railways was repealed and such companies made subject to the franchise tax imposed upon corporations, generally. This change of law effected a substantial saving according to the report of the company. The balance of the decrease was almost entirely due to a reduction in ad valorem taxes. Interest charges for the year amounted to $419,170 compared with $427,825 for the previous year.

During 1927 the Texas Electric Railway spent for maintenance of roadway and equipment $370,400 or $90,650 in excess of the mortgage requirement, which stipulates 15 per cent of its gross revenue annually for this expense. Since Jan. 1, 1917, the company has spent for maintenance purposes $4,935,544 or $903,300 in excess of what it was required to spend under the mortgage requirement.

The management has set aside with the approval of the directors, an additional sum of $100,000 from surplus into renewal and replacement reserve to be used as found necessary and advisable for further maintenance and up-building of the property. Since Jan. 1, 1917, the surplus earnings and reserves of the company have been largely invested in inprovements of and additions to the property, and since that time investments of this kind have been made in the sum of $2,040,333. Of this amount the sum of $975,401 represents a fundable investment against which new securities were issuable. Additional bonds in the amount of $500,000 have already been issued against these improvements but have not been sold. Additions, improvements, renewals and replacements were made in 1927 costing $115,881 compared with $95,477 for the previous year.

The net current indebtedness of the company on Jan. 1, 1927, excluding bonds, debentures and a real estate note but including accumulated interest upon such real estate note and including all other notes and accounts payable less current accounts receivable was $164,000. On Jan. 1, 1928, such net current indebtedness was approximately $99,000.

Without considering the floating indebtedness of approximately $99,000 with which the year 1928 was entered the company will expect obligations during the year as follows:

Operating expenses (estimated by James P. Griffin, vice-president in charge of operation). This item includes an estimated cost of express operation for the last four months of the year of $49,730.	$1,195,830
Taxes (estimated)	66,600
Interest	410,824
Sinking fund requirements	84,500
Total cash requirements for the purposes named	$1,757,754

In addition cash to the amount of approximately $110,000 will be required during the year to take care of renewals, replacements and new construction. President Jack Beall stated in the report that although receipts for the year declined and the necessity for rigid economy was urgent, substantial improvements were made upon the property resulting in much better service.

The report comments on the bus legislation of 1927 which permits the state to issue to bus lines certificates of convenience and necessity "when the agency of the state is forbidden to consider whether existing railway and in-

INCOME ACCOUNT OF THE TEXAS ELECTRIC RAILWAY FOR THE YEAR ENDED DEC. 31, 1927, AND SUMMARY OF SURPLUS ACCOUNT

Gross earnings from operations		$1,864,999
Operating expenses and taxes		*1,189,379
Net earnings from operations		$675,619
Add interest on bank balances		2,063
Total net earnings before depreciation		$677,682
Interest deductions		419,170
Surplus net income before depreciation		*$258,512

SUMMARY OF SURPLUS ACCOUNT

Balance Jan. 1, 1927, per previous certificate			$1,484,240
Add:			
Surplus net income before depreciation for the year ended Dec. 31, 1927, as above	$258,512		
Less — Provision for depreciation (retirements)	*104,566	$153,946	
Sundry direct items— Discount on Texas Traction Company bonds purchased for sinking fund		17,205	171,151
Surplus balance Dec. 31, 1927, per balance sheet			$1,655,391

*Provision for depreciation includes $4,566 bus retirement expense.

Conspectus of Indexes for April, 1928

Compiled for Publication in ELECTRIC RAILWAY JOURNAL by

ALBERT S. RICHEY

Electric Railway Engineer, Worcester, Mass.

	Latest	Month Ago	Year Ago	Since War* High	Since War* Low
Street Railway Fares* 1913 = 4.84	April 1928 **7.61**	March 1928 **7.61**	April 1927 **7.43**	March 1928 **7.61**	May 1923 **6.88**
Electric Railway Materials* 1913 = 100	April 1928 **140.0**	March 1928 **140.1**	April 1927 **148.0**	Sept. 1920 **247.5**	Feb. 1928 **139.5**
Electric Railway Wages* 1913 = 100	April 1928 **228.8**	March 1928 **228.8**	April 1927 **226.9**	Sept. 1920 **232**	March 1923 **206.8**
Am. Elec. Ry. Assn. Construction Cost (Elec. Ry.) 1913 = 100	April 1928 **201.2**	March 1928 **200.5**	April 1927 **202.6**	July 1920 **256.4**	May 1922 **167.4**
Eng. News-Record Construction Cost (General) 1913 = 100	April 1928 **206.4**	March 1928 **204.6**	April 1927 **209.0**	June 1920 **273.8**	March 1922 **162.0**
U. S. Bur. Lab. Stat. Wholesale Commodities† 1926 = 100	March 1928 **96.0**	Feb. 1928 **96.4**	March 1927 **94.5**		
Bradstreet Wholesale Commodities 1913 = 9.21	Apr. 1 1928 **13.42**	Mar. 1 1928 **13.34**	April 1 1927 **12.53**	Feb. 1 1920 **20.87**	June 1 1921 **10.62**
U. S. Bur. Lab. Stat. Retail Food 1913 = 100	March 1928 **151.4**	Feb. 1928 **151.6**	March 1927 **153.8**	July 1920 **219.2**	March 1922 **138.7**
Nat. Ind. Conf. Bd. Cost of Living 1914 = 100	March 1928 **161.1**	Feb. 1928 **161.5**	March 1927 **164.1**	July 1920 **204.5**	Aug. 1922 **154.5**
Steel Unfilled Orders (Million Tons) 1913 = 5.91	Mar. 31 1928 **4.335**	Feb. 29 1928 **4.398**	Mar. 31 1927 **3.553**	July 31 1920 **11.118**	May 31 1927 **3.051**
Bank Clearings Outside N. Y. City (Billions)	March 1928 **19.72**	Feb. 1928 **16.99**	March 1927 **19.53**	Oct. 1925 **20.47**	Feb. 1921 **10.43**
Business Failures Number	March 1928 2007	Feb. 1928 1885	March 1927 1882	Jan. 1924 2231	Aug. 1925 1353
Liabilities (Millions)	**51.54**	**50 62**	**99.26**	**122.95**	**27.22**

*The three index numbers marked with an asterisk are computed by Mr. Richey, as follows: Fares index is average street railway fare in all United States cities with a population of 50,000 or over except New York City, and weighted according to population. Street Railway Materials index is relative average price of materials (including fuel) used in street railway operation and maintenance, weighted according to average use of such materials. Wages index is relative average maximum hourly wage of motormen, conductors and operators on 136 of the largest street and interurban railways operated in the United States, weighted according to the number of such men employed on these roads.

†This index is changed to a base of "1926 = 100." That notation replaces the former basis of "1913 = 100." Inasmuch as the bureau has not calculated the index on this new base any further back than January, 1923, no figures are shown in this tabulation for the high and low points since the war. It is planned to compute the index on the new basis as far back as January, 1913. Until such time as the bureau makes public these figures for the earlier years this information will be lacking.

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terurban lines may not be sufficient to meet completely all transportation needs." Bus competition was extended on the Texas Electric Railway lines during 1927. In most, if not all instances competing bus lines are charging fares substantially less than interurban rates.

President Beall recommends in his report the amendment of the present charter so as to give the company an enlarged corporate authority. Such action will result in placing the company under jurisdiction of the Railroad Commission of Texas and probably under the jurisdiction of the Interstate Commerce Commission.

Beach Property Withdrawn from Sale by Pacific Electric

D. W. Pontius, acting for the Pacific Electric Railway, Los Angeles, Cal., has withdrawn from the market three-quarters of a mile of beach frontage at Redondo Beach, which has been proposed for subdivision. He did so at the request of the citizens' committee on parks, playgrounds and beaches of the Chamber of Commerce. Mr. Pontius was reported to have said:

The Pacific Electric Railway has always felt that this beach frontage should be publicly owned and on several occasions had expressed a willingness to sell to the city or the county at a figure below its actual market value. The present withdrawal of the property from the market, which is for a definite period of months, is a further indication of the recognition by the Pacific Electric of the public need for this beach frontage. The period for which the withdrawal is effective will allow time for the necessary action by the interested public bodies to obtain this beach for the public forever.

Discontinuance Between Warren and Sheffield

The Penn Public Service Corporation, Warren, Pa., operating the Warren & Jamestown Street Railway and the Warren Street Railway, Warren, Pa., on April 1 discontinued service on its interurban line between Warren and Sheffield, Pa., a one-way distance of about 13 miles. Workmen are engaged in removing the tracks and poles along the line.

Another Move Toward Ending Binghamton Receivership

Mortimer B. Fuller, who at the time of the appointment of receivers for the company is understood to have controlled the majority of the stock of the Binghamton Railway, Binghamton, N. Y., is said since then to have acquired additional shares and also bonds of the company, until at the present time he controls practically all outstanding capital stock and bonds. It is thought now Mr. Fuller is anxious to have the sale consummated. Once this is done, he will be in a position to develop the properties, provided he is the successful bidder for the assets of the company. As a move in the direction toward lifting the receivership William H. Hecox, William G. Phelps, Thomas J. Keenan, F. W. Ogden, W. H. Morse, A. J. Parsons and Frank L. Fuller have all resigned as directors of the company.

System at Akron Does Well

Combined results very satisfactory. Railway revenue holds up, but transportation recovery not so full as expected

BUSINESS conditions in 1927, in the territory served by the Northern Ohio Power & Light Company, Akron, Ohio, were generally favorable and were reflected in the increased sales of electricity by the company. The transportation department, however, suffered a loss in traffic due mainly to the increased use of privately owned automobiles. To meet this situation and to be relieved of heavy replacement expenditures incident to highway improvement where rail lines are located, the management has taken steps to replace certain interurban car routes with bus service and otherwise to devise ways and means of bettering the earnings of the transportation department. The income available for dividends in 1927 was $2,197,688, compared with $1,397,208 in 1926.

Only Slightly Fewer Passengers Carried

Gross earnings of the transportation department increased $20,688, or 0.36 per cent over 1926. Partial suspension of transportation service due to a strike of certain employees in May, 1926, adversely affected both passenger riding and revenue in that year and a greater recovery naturally was anticipated in 1927. That this recovery was not realized is accounted for by continued increases in the number and use of privately owned automobiles. However, economies effected in operation, particularly in the transportation department, together with the benefits derived from capital expenditures previously made, resulted, in a substantial increase in total net income for 1927.

The number of revenue passengers carried by the transportation department showed decreases on both the city and interurban systems, as compared with 1926. In the case of the city systems, the decrease was 1,044,393 passengers, or 2.13 per cent, and in the case of the interurban systems, the decrease was 501,390 passengers, or 3.48 per cent.

STATEMENT OF EARNINGS OF NORTHERN OHIO POWER & LIGHT COMPANY

	1927	1926
Gross:		
Electric	$6,815,900	$6,317,554
Transportation	5,743,975	5,723,286
Total	$12,559,876	$12,040,840
Operating expenses and taxes:		
Operating expenses	$7,774,085	$8,181,133
Taxes	890,800	802,200
Total	$8,664,885	$8,983,333
Gross income	$3,894,990	$3,057,507
Interest—net	$1,575,677	$1,527,628
Amortization of debt discount and expense	121,624	132,670
Total	$1,697,301	$1,660,299
Net income available for dividends and retirement reserve	$2,197,688	$1,397,208
Dividends on preferred stock	$512,108	$473,824
Provision for retirement reserve	700,000	400,000
Total	$1,212,108	$873,824
Balance	$985,579	$523,383
Ratio of operating expenses to gross earnings, per cent.	61.90	67.94
Ratio of operating expenses and taxes to gross earnings, per cent	68.99	74.61

REVENUE PASSENGERS CARRIED BY N.O.P. RAIL AND BUSES

Years	City Systems	Interurban Systems
1923	54,112,423	16,784,535
1924	48,563,053	14,478,984
1925	51,352,849	14,266,754
1926	48,973,671	14,398,663
1927	47,929,278	13,897,273

During the year the company handled 140,523 tons of freight, yielding a gross revenue of $611,696—approximately the same tonnage and revenue as reported for the preceding year.

The capital expenditures of the company in 1927 were $2,143,913. Of this amount, $1,372,315, or 64.01 per cent, was used in the electric department, $732,099, or 34.15 per cent, in the transportation department and the remaining $39,498, or 1.84 per cent, was used for general purposes.

The more important property additions and improvements in the transportation department during the year were as follows:

Purchase of ten 29-passenger and one 44-passenger city type buses for service in Akron and purchase of ten 29-passenger buses and fourteen 29-passenger bus bodies for use in the interurban service.

Renewal and reconstruction of track, both interurban and city, at various places on the system.

During the five-year period ended Dec. 31, 1927, the capital expenditures of the company were $12,595,297.

The safety and accident prevention department contributed very materially to safe operation during 1927. Total accidents decreased approximately 9 per cent, as compared with results reported in 1926, and the number of vehicle and car collisions was again reduced. The very effective work accomplished in the company's training school for car and bus operators is cited as one of the important factors which contributed to this record.

Wisconsin Public Service Issues Report

Gross earnings of the Wisconsin Public Service Corporation, Milwaukee, Wis., and subsidiary for the year ended Dec. 31, 1927, increased 4.97 per cent, and net earnings 2.07 per cent. According to the report of Halford Erickson, president, the transportation system in Manitowoc and between Manitowoc and Two Rivers was improved by the substitution of buses for railway service. The report referred to the intention of the company to replace the railway system in Marinette-Menominee by modern buses.

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Good Year Reported by Ogden Property

An income balance of $42,476 was transferred to profit and loss by the Utah-Idaho Central Railroad, Ogden, Utah, for its 1927 operations. The company closed the year with a total corporate surplus of $803,916, which was $68,997 more than at the close of 1926. A profit of $6,587 was realized from the 1927 operation of its bus line between Ogden, Utah, and Preston, Idaho.

Redemption of Illinois Power & Light Issue Sanctioned

Stockholders of the Illinois Power & Light Corporation, Chicago, Ill., have approved the creation of an issue of 600,000 shares of no par preferred stock entitled to cumulative dividends up to $6 annually, and have authorized an increase in the callable price of the present 6 per cent preferred to 110 from 105. The new preferred will rank equally with the 6 per cent issue excepting in the dividend terms. It is proposed to call for redemption all the outstanding 7 per cent preferred at 105 and accrued dividends, the holders to be given the opportunity to exchange their stock for the new $6 preferred on a favorable basis.

Abandonment of Indiana Line Approved

The Indiana Public Service Commission has approved an order of the Vanderburg County Probate Court in Evansville, Ind., authorizing William A. Carson, receiver of the Evansville & Ohio Valley Railway, Evansville, Ind., to abandon the Henderson division line of the road.

Short Line in Pennsylvania Abandoned

The Allen Street Railway, Nazareth, Pa., discontinued operation on Jan. 24, 1928. The line was 5 miles long, reaching the towns of Bath and Nazareth.

Personal Items

W. J. Beadle Leaves Philadelphia

W. J. Beadle, transportation and traffic consultant for Mitten Management, Inc., Philadelphia, Pa., has accepted a position with E. I. du Pont de Nemours & Company, Wilmington, Del. He will leave Mitten Management on May 1 to assume his new duties in the development department of the du Pont organization. He has been a member of the Mitten Management and Philadelphia Rapid Transit Company organizations for several years, serving first in the traffic department as an assistant to the traffic engineer; later becoming traffic engineer, and then transportation manager. In 1927 he left the operating forces of the latter company to carry on a number of transportation and traffic research problems for Mitten Management.

Before going with the Philadelphia Rapid Transit Mr. Beadle was a member of the engineering department of the National Analine Company. He was graduated from the Massachusetts Institute of Technology in 1917. During the World War he saw active service in France in the infantry.

F. M. Mills Active Railway President at 97

F. M. Mills, president of the Sioux Falls Traction System, Sioux Falls, S. D., celebrated his 97th birthday recently. Twenty-one years ago at the age of 76, Mr. Mills went to Sioux Falls and started the Sioux Falls Traction Company. Although today a large part of the work is in the hands of his son, Roger Mills, F. M. Mills still takes an active part in the road's operation. Last June Mr. Mills was given an honorary M.A. degree by his alma mater, Wabash College. In 1921 the college, conferred a B.A. degree on him.

Messrs. Anderson, Lockhart and Hackett Advanced at Providence

R. Roscoe Anderson, for many years superintendent of transportation, has been promoted to the post of general superintendent of operations of the United Electric Railways, Providence, R. I. At the same time, announcement was made by Alonzo R. Williams, general manager, of the promotion of Joseph A. Lockhart to assistant superintendent of transportation and James A. Hackett to supervisor of traffic.

General supervision of all transportation matters, with particular reference to important constructive studies of the system as a whole and the development of plans for the future needs, will be in the hands of Mr. Anderson.

All operations in the transportation department as far as the passenger service is concerned will be supervised by Mr. Lockhart.

All matters pertaining to the various carhouses on the system and all operations of the company will be under the immediate supervision of Mr. Hackett. He will represent the general manager, the general superintendent and the assistant superintendent of transportation throughout the system.

Mr. Lockhart has been with the company 23 years and has been connected with the claim department and various departments in the transportation system. Mr. Hackett has been in the employ of the company at Providence more than 30 years.

Superintendents of eight divisions which have been created have been appointed as follows: Jacob M. Rounds, Paul T. Breese, Frank H. Brown, George S. Amidon, William A. Andrews, William D. Mathewson, Edward J. Coffield and Eugene E. Hargraves.

Obituary

Elias Elkan Ries

Elias Elkan Ries, long identified with many branches of the electrical industry through his inventions, died on April 20 at his home in New York City at the age of 65. Mr. Ries is credited with having taken out more than 250 patents, mostly in the electrical field. They included equipment for telephones for alternating-current distribution, incandescent lamps and electric motors and energy distribution for electric railways. Many of his basic patents were purchased in 1903 by the Westinghouse Electric & Manufacturing Company.

Mr. Ries was born in Baden, Germany, in 1862. He moved to this country with his parents in 1865. At an early age he was connected with the Western Union Telegraph Company, the Edison Manufacturing Company and others. He studied physics at Johns Hopkins University, Baltimore, Md., and for many years was a resident of that city.

HARRY C. SANFORD, chief engineer of the Rosoff Subway Construction Company, died on April 22 in the Englewood, N. J., Hospital. Mr. Sanford had directed much of the important subway building in New York in recent years. After he was graduated from Valparaiso University in 1889 he joined John B. McDonald, the contractor for New York's first subway, and later helped him to construct the Akron & Chicago Junction Railway. He moved to Baltimore with the firm of Ryan & McDonald and participated in the construction of the tunnels of the Baltimore Belt Railway. For the Degnon Construction Company of New York City, with which he was associated for many years, he directed as chief engineer the construction of the 42nd Street Subway from Fourth Avenue to Broadway, the Steinway Tunnel under the East River and the Hudson & Manhattan tube under Sixth Avenue from Ninth Street to 33d Street. Mr. Sanford was 58 years old.

WILLIAM JEFFERSON PAYNE, railway investor and newspaper publisher, died recently at a Richmond, Va., hospital. For a number of years, and until 1914, he owned and operated the entire railway system in Newport News, Hampton and Old Point. He built the railway system in Danville. Colonel Payne was 65 years old.

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Before the war Colonel McKay was vice-president of the J. G. White Company. He is a conspicuous example of a West Point-trained army officer who has attained success not only in the engineering field but also in business life. He has proved his interest in civic matters, having served not only as former Police Commissioner of New York City but also as County Commander of the Westchester post of the American Legion.

$50,000 Chicago "L" Terminal Under Way

A $50,000 station at the Logan Square terminal of the metropolitan west side division is being constructed by the Chicago Rapid Transit Company, Chicago, Ill. The exterior of the new terminal building will be white terra cotta, with old English style mission-brick panels and will conform in general style to other new stations recently erected by the company. A. U. Gerber is the architect of the new station, which will be completed about July 1.

ROLLING STOCK

SEATTLE MUNICIPAL STREET RAILWAY, Seattle, Wash., will order 100 cars from the St. Louis Car Company. The cars will be similar to the 1300 series now being used by the St. Louis Public Service Company. The contract for them will probably be signed in June.

NORTHWESTERN PACIFIC RAILROAD, San Francisco, Cal., is preparing specifications for five new motor cars and five new trailer cars.

OHIO VALLEY BUS COMPANY, Huntington, W. Va., has ordered two 20-passenger buses from the Studebaker Corporation, South Bend, Ind.

DETROIT DEPARTMENT OF STREET RAILWAYS, Detroit, Mich., has been authorized by the Street Railway Commission to sell seventeen one-man safety cars, which have been in use seven years, at a price of $3,000 each. The purchase of a new motor coach at a cost of $4,000 was also authorized at the same time to supplement the present bus service between the downtown hotel district and the Ford Airport at Dearborn, Mich.

PUBLIC SERVICE CO-ORDINATED TRANSPORT, Newark, N. J., has accepted delivery on three Mack six-cylinder 29-passenger city type buses.

VAN SWERINGENS, identified with the New York, Chicago & St. Louis Railroad, Cleveland, Ohio, have asked for bids on 25 150-ton electric locomotives, the delivery date to be Jan. 30, 1930.

TEXAS MOTOR COACHES, Fort Worth, Texas, a Stone & Webster operation, has accepted delivery of six Mack four-cylinder Parlor Car chassis, 230-inch wheelbase, 25-passenger capacity. The bodies will be built by Lang.

ILLINOIS POWER & LIGHT CORPORATION, Peoria, Ill., has received five 30-passenger A.C.F. urban coaches.

KANSAS CITY PUBLIC SERVICE COMPANY, Kansas City, Mo., will probably purchase some new buses if the rerouting plan, submitted to the City Council, is passed. The Yellow Truck & Coach Manufacturing Company is sending a new single-deck bus to the company for trial purposes.

BOSTON ELEVATED RAILWAY, Boston, Mass., has received four A.C.F. gas-electric metropolitan coaches.

METAL, COAL AND MATERIAL PRICES

F. O. B. REFINERY	April 24, 1928
Metals—New York	
Copper, electrolytic, cents per lb.	14.00
Copper wire, cents per lb.	16.00
Lead, cents per lb.	6.10
Zinc, cents per lb.	6.15
Tin, Straits, cents per lb.	52.375
Bituminous Coal, f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	4.225
Somerset mine run, Boston, net tons	1.875
Pittsburgh mine run, Pittsburgh, net tons	1.95
Franklin, Ill., screenings, Chicago, net tons	1.825
Central, Ill., screenings, Chicago, net tons	1.675
Kansas screenings, Kansas City, net tons	2.50
Materials	
Rubber-covered wire, N. Y., No. 14, per 1,000 ft.	5.30
Weatherproof wire base, N. Y., cents per lb.	16.5125
Cement, Chicago net prices, without bags	2.05
Linseed oil (5-bbl. lots), N.Y., cents per lb.	10.20
White lead in oil (100-lb. keg), N. Y., cents per lb.	13.25
Turpentine (bbl. lots), N. Y., per gal.	$0.595

SHOPS AND BUILDINGS

SAN ANTONIO PUBLIC SERVICE COMPANY, San Antonio, Tex., will add a 40,000-hp. unit to its Comal plant.

CHICAGO, SOUTH SHORE & SOUTH BEND RAILROAD, Michigan City, Ind., is planning an addition to its new receiving and shipping station in South Bend, Ind.

TRACK AND LINE

DETROIT DEPARTMENT OF STREET RAILWAYS, Detroit, Mich., will determine the cost of purchasing from the Detroit United Railway, the private tracks on Grand River Avenue between Meyers Road and Redford, the franchise for which expired recently. The Department of Street Railways has been renting these tracks at 7½ cents per car-mile, amounting to about $75,000 per year.

CHICAGO, SOUTH SHORE & SOUTH BEND RAILROAD, Michigan City, Ind., will spend approximately $50,000 installing a high-speed passing track at Tamarack, 4 miles west of Michigan City. On the Oak Hill-Sheridan section, track relaying has been started. Ten and a half miles of 100-lb. rail is to be installed before July 1 at a cost of about $150,000.

TRADE NOTES

VERSARE CORPORATION, Albany, N. Y., has appointed R. A. Nash as special representative with headquarters in Cleveland, Ohio. Mr. Nash is a graduate mechanical engineer from Rutgers and has been for seven years superintendent of equipment for the United Traction Company, Albany, N. Y., for two years sales engineer for the Electric Service Supplies Company, Philadelphia, Pa., and for 2½ years district representative of the Yellow Truck & Coach Manufacturing Company, Chicago, Ill.

WRIGHT MANUFACTURING COMPANY, Lisbon, Ohio, has sold its business and trade name to American Chain Company, Bridgeport, Conn. H. F. Wright and W. F. Wright will continue in their respective divisions of sales and production of Wright products.

THEODORE BERAN, commercial vice-president of the General Electric Company in charge of the New York district, has submitted his application to retire from active business, effective May 1.

C. O. BARTLETT & SNOW COMPANY, Cleveland, Ohio, announces that it has appointed W. H. Norrington as its representative in New York City, and vicinity. Mr. Norrington will maintain his office at 30 Church Street.

TRICO FUSE MANUFACTURING COMPANY, Milwaukee, Wis., announces the removal of its Pittsburgh office to new and larger quarters at 405 Penn Avenue.

TIMKEN ROLLER BEARING SERVICE & SALES COMPANY, Canton, Ohio, announces the appointment of W. H. Post as manager of its Pittsburgh branch office.

MOBILE & OHIO RAILROAD has purchased three motor cars from the St. Louis Car Company and the Electro Motive Company, to replace steam equipment in the Montgomery district. The seats in the new gas-electric units face the rear, giving the passengers an unobstructed view. The cars are equipped with a new type of observation platform finished in brass, with the entire rear end of the car inclosed in glass.

ADVERTISING LITERATURE

PEREY MANUFACTURING COMPANY, New York, has issued a folder on the handling of New York City's after theater crowds with Perey turnstiles.

CROUSE-HINDS COMPANY, Syracuse, N. Y., has issued Bulletin No. 2112 on "Railway Mail Car Lighting and Fan Installations."

QUIGLEY FURNACE SPECIALTIES COMPANY, New York, N. Y., issued a new bulletin describing the Quigley bitumen gun, designed for shooting hot or cold materials as protective coatings on surfaces.

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The Rockford Plans Ahead

"Give the riding public what it demands." This seems to be the motto of the Rockford Public Service Company for the American Car Company has built seven new light weight cars for their interurban service. These cars were built to please and are the last word in speed, comfort and attractive design. The average weight is 35,750 lbs.

According to their General Superintendent, general satisfaction and increased schedule speed are being enjoyed while one of the largest contributions to improved riding quality is the Brill 177-E Truck.

The Rockford has anticipated the requirements of the public in supplying these new, modern cars. It is a wise investment.

Let us send you detailed specifications of this modern equipment.

THE J. G. BRILL COMPANY
PHILADELPHIA, PA.

AMERICAN CAR CO. ST. LOUIS MO. — G. C. KUHLMAN CAR CO. CLEVELAND, OHIO. — WASON MANF'G CO. SPRINGFIELD, MASS.

Brill Light Weight Interurban Cars

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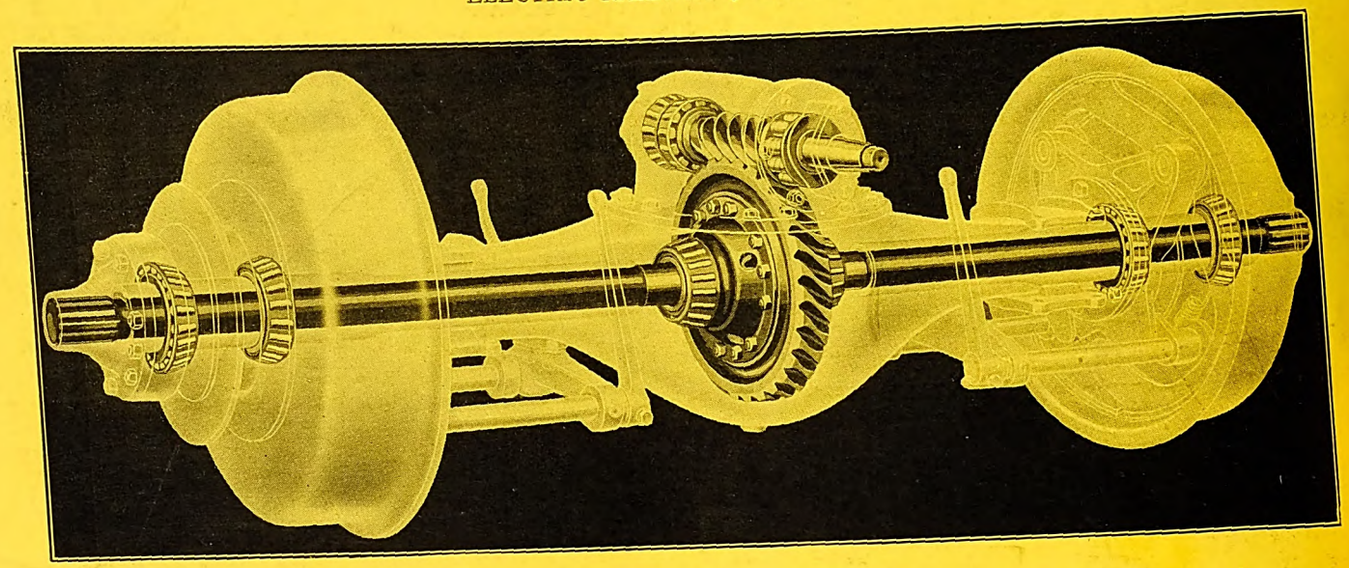

From start to stop *efficient!*

Silently, with minimum of friction and wear, a Timken Worm Drive Rear Axle sets the rear wheels in motion.

In the extremes of hauling service—mile after mile, year after year—Timken Axles are distinguished for trouble-free, low-cost performance.

It's no wonder so many experienced operators believe in Timken Worm Gearing as the ideal final drive.

THE TIMKEN-DETROIT AXLE CO., DETROIT, MICH.

TIMKEN AXLES

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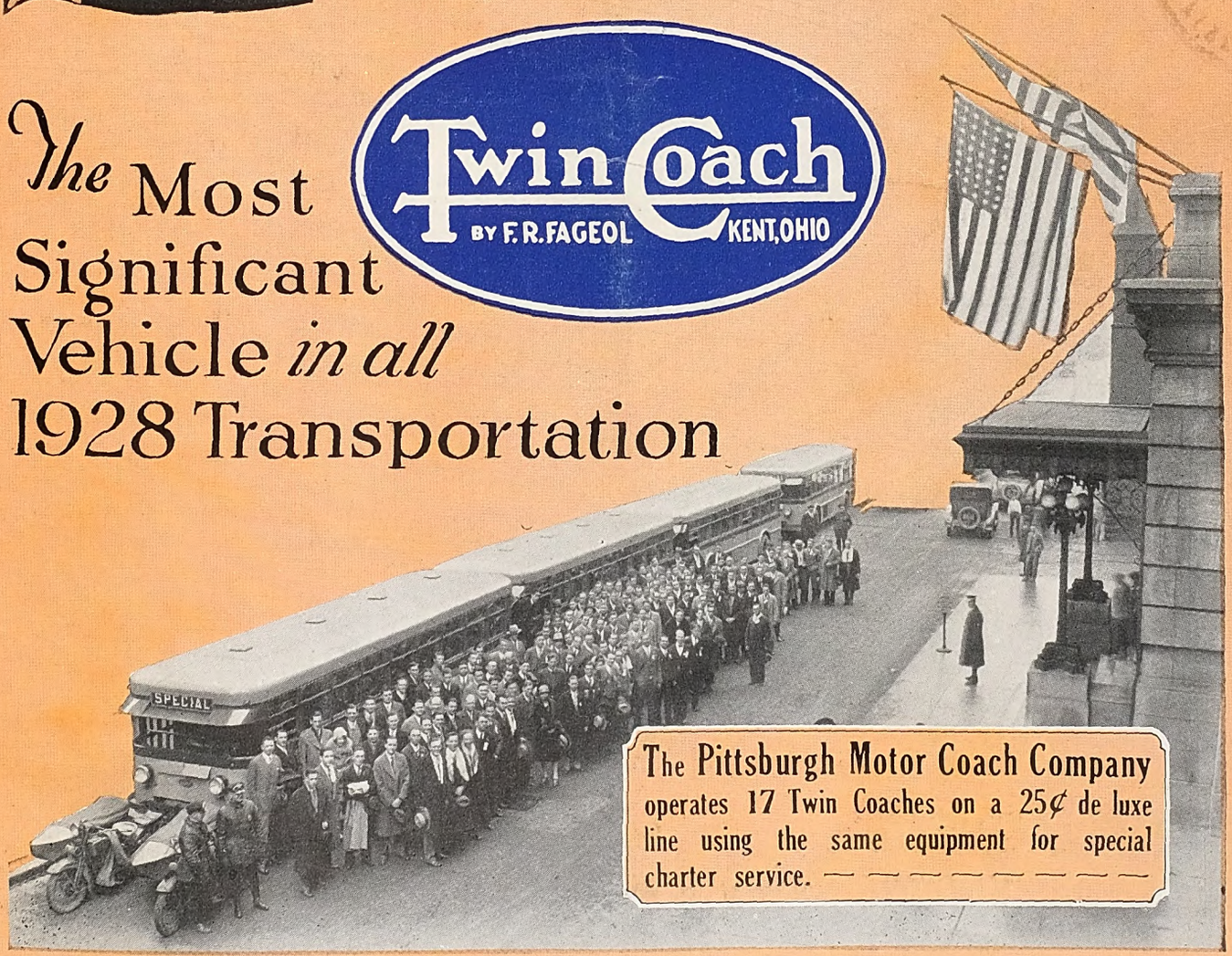
ELECTRIC RAILWAY JOURNAL

cGraw-Hill Publishing Company, Inc. MAY 5, 1928 Twenty Cents Per Copy

The Most Significant Vehicle *in all* 1928 Transportation

Twin Coach
BY F. R. FAGEOL KENT, OHIO



The Pittsburgh Motor Coach Company operates 17 Twin Coaches on a 25¢ de luxe line using the same equipment for special charter service.

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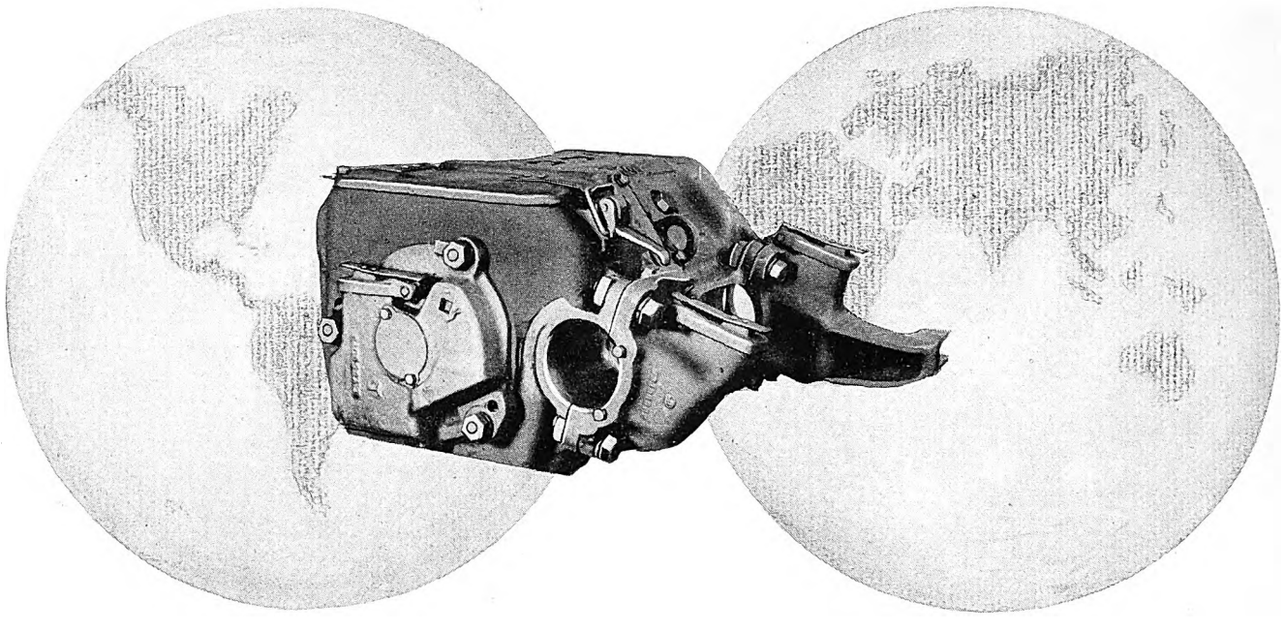
6400 Type 510 Motors ~

(35 Horsepower)



~ are useful transportation servants the world over

Where Type 510 Motors are used

United States

Alabama
Florida
Hawaii
Iowa
Illinois
Indiana
Kansas
Louisiana
Maryland
Massachusetts
Michigan
Missouri
Nebraska
New Jersey
New York
Ohio
Pennsylvania
South Carolina
Texas
Virginia
Washington
West Virginia
Wisconsin

Abroad

Canada
Costa Rica
Japan
Mexico
Newfoundland
Spain

THERE are 6400 Westinghouse Type 510, 35 horsepower motors powering more than 1600 modern electric street cars at the present time. Most of these cars are in congested city service where frequent stops and high accelerating rates are necessary

Geographically, the operation of cars equipped with this dependable motor is distributed over numerous transportation arteries in cities throughout 23 states and in 6 countries abroad. Many of its users repeatedly have ordered this motor for their new cars.

The large number in service attests to the ability of the Type 510 motor to withstand the grind of difficult city service with reliable operation, high quality of performance and the minimum cost of upkeep.

The nearest Westinghouse representative will furnish reference to railway properties using the Type 510 motor in your territory, and detailed information about its construction and performance.

Westinghouse Electric & Manufacturing Company
East Pittsburgh Pennsylvania

Sales Offices in All Principal Cities of the United States and Foreign Countries

MEMBER AMERICAN ELECTRIC RAILWAY ASSOCIATION AERA 1928

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Electric Railway Journal

McGraw-Hill Publishing Co., Inc.
JAMES H. MCGRAW, *President*

Consolidation of
Street Railway Journal and
Electric Railway Review

CHARLES GORDON
Editor

Volume 71 New York, Saturday, May 5, 1928 *Number* 18

When a Contract Is Not a Contract

PROVISION against confiscation of property without due process of law, as stated in the Constitution, has been a life saver to utility corporations in these days of advancing operating costs. For years New York City has waged the fight to prevent utilities from increasing rates to the point where they would become self-sustaining. True, the Consolidated Gas case was decided in favor of the company, but that only made the authorities more adamant in their refusal to grant relief to the transportation companies. The contracts were considered unbreakable. They had been drawn by astute corporation lawyers at a time when it was feared the city would force a reduction in rates. With the tables turned, the city has stood ready to collect its pound of flesh.

The decision of the federal statutory court, rendered May 2, if sustained by the United States Supreme Court, will change all this. It holds the 5-cent fare on the subway and elevated lines of the Interborough Rapid Transit Company to be confiscatory, and for that reason enjoins the Transit Commission from enforcing various rate limitations, restricting the fares charged on the Interborough lines to 5 cents.

The decision is of greater moment locally than outside of New York, since in nearly all other cities the fares have been readjusted along business principles. It does confirm the judgment of those who have fought for the application of the rule of reason in dealings between regulatory bodies and the utilities, and so is greatly to be welcomed. It is to be hoped that it will prevent for all time the policy of some city administrations of making an issue out of the rates charged the public for transportation, and allow development to proceed along economic rather than political lines.

That the Executive May Be a Leader

RULE books for trainmen are common. Those for other railway employees are few in number. Rule books outlining the duties of executives are rare indeed. Nevertheless, one of the latter has been developed by the Chicago, North Shore & Milwaukee Railroad as part of its service improvement program. The book is unusual, not only because very few of this type exist, but also because of its contents and the purpose for which it was intended.

Containing as it does a collection of principles to guide all the men in the company in supervisory work in their relation with subordinates, it is a means of showing them the way to respected leadership. Of course, it is evident to anyone that the mere knowledge of principles such as these will not in itself make a man become a capable executive overnight. Nothing can replace character and personality. These cannot be obtained from the study of any book of rules. Study of principles, however, should give the executive working tools, and if he will use them in a practical way he will naturally become a better leader.

The material in the rule book is merely suggestive. In executive work it is difficult if not impossible to make a hard and fast set of rules. The style used is the most effective, in that it leaves to the initiative of the individual the detail of the course he should follow in meeting any particular situation. Good judgment of course is essential in using any such code of principles.

The book was intended to foster good will and co-operation between employers and employees. Two of its five sections, headed "Building Morale" and "Relations Between Executives and Subordinates," bear this out. The method of securing the information, by informal conferences, discussions and questionnaires, also indicates that the purpose of preparing the book was to establish better relations.

Any executive who practices the principles outlined in the book is certain to command the respect and receive the co-operation of every employee and thus make himself, in the true sense of the phrase, a better leader.

The Carcass of a Former Giant

OUT of the ashes of the receivership of the once magnificent Detroit United Railway there shortly will arise a new company. Physically, it will be only a semblance of the former giant system of city, suburban and interurban railways, but it will be articulate. The city lines once included in the system are under municipal ownership, one of the interurbans formerly considered most promising has been cut off entirely as not consistent with the plan now in view, and, finally, the holders of the common stock have been wiped out entirely.

The present management had nothing to do with the situation; it was inherited. The problem before it was almost insuperable. That it has been able to work out the present plan is a matter of congratulation. But how much better it would have been if the régime that went before had had a keener appreciation of the value of good public relations and been endowed with only an iota of the vision that has characterized the rehabilitators of the system!

The management of the old Detroit United dissipated its energies in a fight with the city while it neglected the suburban and interurban lines. It lost out in the city and then found itself confronted with problems elsewhere with which it was ill equipped to deal. Its code was antiquated. If it distinguished correctly the growing pains of the colossus that is now Detroit, it was staggered by what it sensed. And, as often happens, a man who had come up from the bottom, made an immense amount of money and had succumbed to the political

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itch, turned out to be the David who slew the giant with weapons of the giant's own choosing. Meanwhile the industry as a whole watched in disgust the unequal combat and saw the gladiator ride from one political office to another, and finally into Washington, the crowning compensation of a people who could do no more for him. These were the days in which the electric railways were just beginning to awaken to the fact that industry consciousness and industry responsibility did not begin and end with an annual convention.

The handling of the old property is in strange contrast with the quite heroic battle of the representative of the road's creditors. It is a contrast not flattering to the régime which in practicing the art of public utility management regarded by some at that time as Machiavellian and the beginning and the end of all things was about as successful as was Machiavelli himself in his efforts to turn to his own account the shrewd practice which he expounded so succinctly. The charitable thing is to dismiss the matter on the ground that the executives know no better. That, however, is small compensation to an industry which now finds it difficult to explain away the physical fact of municipal ownership in one of the biggest cities in the country and still smaller compensation to security holders of one class or another who have had to bear the colossal shrinkage incident to failure and foreclosure.

Cultivating an Unworked Field

WHILE freight has been mentioned many times as a potential source of revenue for the interurban railway, it is not so often that actual results are obtainable to prove the point. The article appearing in the JOURNAL last week, however, indicates the extent to which a line can build up its freight business in a short time. When the present management took over the Chicago, South Shore & South Bend Railroad less than three years ago freight was a minor source of revenue. To remedy this situation an intelligent and constructive program was adopted. Interchange arrangements with other carriers were effected, passing tracks were lengthened, new freight houses were built and new rolling stock and locomotives were purchased.

These changes in the physical layout of the plant and in the arrangements were not in themselves enough to bring in the business. The management took the viewpoint that if the patronage of the public was to be secured, entirely new methods of doing business would have to be adopted by the freight department. Accordingly through routes were established in conjunction with other railways and tariffs were made accordingly. Attention was paid to the development of a fast overnight service, particularly between Chicago and the principal points on the line. Delayed shipments were not left to take their own course, but care was taken to trace them by wire. Personal contact between the solicitors of the road and the shippers also assisted in an understanding of the problem, so that better and quicker handling of shipments has become possible.

As a result the freight business has grown by leaps and bounds. The revenue doubled in two years, and is still on the increase. As an indication of the growth, the company originally ordered four main-line locomotives for the service. Within a year two switchers were added, and in March of this year two more main-line locomotives were placed in service, doubling the original equipment. Nor has the increase in the freight business been at the expense of passenger traffic, for that has shown an equal growth. But that is another story.

Examples such as this justify faith in the interurban railway when it is rightly placed. Not every property has equal possibilities; but there are many roads that today are not profitable which could, with the use of considerable brain power and relatively little expenditure, become sources of revenue that would make them attractive to investors as well as to the shippers in their territory.

Distribution—Industry's Greatest Problem

WASTEFULNESS in the distribution system is considered by many authorities the gravest issue now before American industry and commerce. Our production methods are without an equal. As a nation we have been eliminating waste, standardizing and simplifying manufacturing methods, and increasing production efficiency, but according to Dr. Julius Klein, director of the U. S. Bureau of Foreign and Domestic Commerce, the wastefulness of our distributing methods, viewed from any angle, looms up with compelling magnitude. In amount it is estimated at some $8,000,000,000 annually.

There is no way of checking accurately the losses involved through practices such as the careless administration of credit, careless installment selling, ignoring of good markets, overselling of poor markets, and mistakes in other distributive elements such as warehousing, delivery, advertising, clerical hire and management of traveling salesmen. When the actual returns of wholesalers and retailers are examined, it is found that their average profit in 1925, the latest year for which complete statistics are available, was 2.2 per cent of their total revenue, as compared with 5.9 per cent for manufacturers and 12.5 per cent for bankers. Next to agriculture, the wholesale and retail trade had the lowest net profit.

Recently when executives of a large number of firms were asked what efforts they were making toward remedying this condition 73 per cent replied that they were endeavoring to reduce production costs, but only 29 per cent indicated any effort to cut sales expenses. Evidently there still is much to learn if retail selling is to pay a profit.

But what should we know about distribution and how can we discover the wastes and their remedies? The problems which are uppermost in the minds of thousands of distributors, according to queries received by the Department of Commerce, seem to be primarily of two varieties: (1), where can things be sold and (2), how much should it cost to sell them? Blind marketing and the exploiting of remote territories seem to be our chief shortcomings.

To gain information on these subjects requires no elaborate research agency. The facilities of the Department of Commerce and numerous other organizations are ample to keep any far-sighted manufacturer advised as to market changes and factors which affect the demand for his product. With this information and the efforts of literally hundreds of agencies, it would seem that the actual materials for the improvement of this situation are available. The next major problem is to apply the data produced by these agencies to the actual problems of marketing. Therein lies a great field for the future improvement of distribution conditions in this nation.

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Keep Cars on the Road Where They Can Give Service

SINCE the business of electric railways is to provide transportation every effort should be directed toward keeping cars on the road. That cars are too valuable to be held in shops any longer than necessary should be the governing principle on which a modern electric railway repair shop is designed. Whether small or large the modern shop should be equipped with every practical device for making repairs quickly and returning cars to service speedily.

The better the shop and the faster it can turn out work the smaller it can be on a particular property. It should store virtually no cars, for they should be kept on the road where they can earn money. To keep an investment of $15,000 or more per car working as nearly full time as possible justifies a large investment in spare parts and shop equipment. Then, too, the number of spare cars can be reduced. If this policy makes it possible to provide a given service with fewer cars the saving both in the investment in cars and in the investment in shop buildings is obvious.

An outstanding example of what can be done in speeding truck repairs so that cars will be available for service a maximum part of the time is furnished by the truck repair methods used in the Coney Island shops of the Brooklyn Manhattan Transit Lines, which form the subject of an article in this issue. Here the time that a car is in the shop for truck repairs is only that needed to drop out the disabled truck and replace it with a repaired one. This is made possible by adequate cranes, drop-pit transfer tables and other handling equipment so arranged that no time is wasted in the transfer. Repairs to the trucks themselves are also completed more speedily, since the work can be organized as a continuous process and no time is lost waiting for trucks to be placed in the shop.

A Sword That May Cut Two Ways

ECONOMY, at best, is only a negative virtue, and unwise economies are worse than none. Especially in furnishing transportation service, an economy is of doubtful value when it increases the difficulty of using that service. For a transportation company to withhold necessary expenditures for route and destination signs is an extremely poor economy. The company has nothing to sell except transportation, and transportation always involves a destination. If it makes a mystery of the destination of its vehicles it will ultimately find that it has no buyers for its wares.

Too often the managements of electric railways regard route and destination signs merely as a source of expense. Ostensibly in the interest of economy, for example, the management of one large property recently decided to remove all route signs from the rear and from the left-hand sides of its cars. Some time earlier the same company had abandoned the use of illuminated route signs in favor of a cheaper type. Of course these changes did not make it impossible for prospective passengers to determine the destinations of cars, but they did make it considerably more difficult to do so. After so much has been said in this industry about merchandising transportation it is almost incredible that any management should show such a woeful lack of salesmanship. The worst of it is, that this particular company is one of a considerable number which still practice "economies" of this kind.

On the other hand, many railways are cheerfully assuming a greater and greater obligation of telling the public where their cars are going rather than leaving it to the passengers to find out for themselves. Large, legible, well-lighted destination signs have been placed on the front and rear of the cars and on both sides as well. Smaller signs in several places tell the destination on each particular trip. Some companies go even further and display prominently big numbers or letters to designate the route. Money expended for these signs is one of the best investments which any transportation company can make. The foolishness of buying a pig in a poke is proverbial. No sensible person would do it. No transportation company should ask people to buy rides on a vehicle when they cannot easily ascertain its destination.

Industry Results Reflected in Statistical Study

TRULY representative of the financial trend of the electric railway industry, the figures compiled annually by the Association from the operating returns of typical groups of roads for the previous year are always significant. This year they are, perhaps, especially significant since for the first time in recent years they reflect results in a period of restricted business. Interest just at this time is not so much in confirmation of the fact that the city lines are holding their own the best, but in the need for driving home the lesson of greater and greater vigilance by the interurban and suburban companies, which are the ones finding it more and more difficult to maintain themselves. From this latter group the private automobile and the intercity bus are taking a heavy toll of traffic. On the other hand, the city lines sustained a loss of only 1.26 per cent in revenue passengers in a year of subnormal industrial activity. Best of all, the city group was able to increase its net income substantially. Its operating ratio, 70.91 per cent, is still high, but the expenses have been pretty well stabilized.

It is encouraging that the study of the industry as a whole has established the fact that while buses were operated by the railways at a deficit in 1926, there was a substantial margin above expenses from this source in 1927. At first this might seem relatively unimportant since the gross of the bus lines is small compared with the gross for the whole group, but the results with buses are more significant than the stark figures would seem to indicate. They show that the industry is using the bus more intensively and more intelligently.

The greater operating efficiency shown in the statistics certainly reflects the more intensive effort being made to watch the little leaks. For one thing cars are being used to better advantage. But these are details the compiler of the figures has discussed in his own comments. Not for a moment can a single company in any one of the groups afford to let down in its efforts, but the suburban and interurban railways especially must be constantly on their guard. By and large, their case is acute, but the many instances of what individual roads in this group have been able to do should tend to spur on to greater and greater effort even the roads most sorely beset. In the past the suburban and interurban railways have had the majority of failures, but it also is in this group that instances have been furnished of the greatest hardihood and the most significant successes.

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Modernization in Little Rock Brings

Most Successful Year

Last two years show attractive earnings. One-man operation of cars has increased revenues, reduced accidents, curtailed expenses and promoted good will

"Be our guest—ride free and inspect this car," was the greeting that Little Rock citizens received from dash signs on the front end of their modernized transportation system

FURTHER confirmation of the success which is possible through modernization is furnished by the results achieved by the Little Rock railway property of the Arkansas Power & Light Company. As the capital of a state some 240 miles square in the heart of the Mississippi valley, Little Rock, with a population of slightly more than 75,000, finds it difficult to conceive of civic development without adequate mass transportation. Arkansas claims the distinction of not having had a single electric railway abandon its service with the advent of many things, including the automobile, that in recent years have caused concern to many street railway properties.

Realizing the greatest advantage of the automobile is its speed, the street car service in Little Rock has been given all the speed considered consistent with safety, as an accompanying table shows. Speed had much to do with the choice of 30 new single-truck "rail coaches" put in service early in 1926. For the same reason the company's double-truck cars were rebuilt in the same year and equipped with four motors instead of two in order to provide increased acceleration and higher speed.

In the modernization program the one-man system has been adopted 100 per cent. New cars and those rebuilt since the change to the one-man plan was decided upon include, in addition to the 30 mentioned above, an earlier purchase of eight double-truck cars. In 1926 twenty existing double-truck cars were rebuilt and in 1927, automatic rear treadle doors were added to twelve cars to fit them for one-man service.

Because of the increases that were made in service when one-man cars were introduced, the total number of trainmen employed was not radically decreased. Subsequent resignations, discharges, and transfers to other positions have reduced the number of trainmen from 185 in 1925 to 105 as of March 1 of the present year. One immediate result of the use of one-man cars was the decrease of headways made possible on two of the more heavily patronized city lines, Fair Park-East Ninth, and South Highland-East Fourteenth. The improved service, backed by an extensive advertising campaign, is credited with having turned the tide of electric railway receipts in Little Rock. The increased receipts and a notable decrease in expenses account for the favorable net earnings which have accrued during the past year.

One bus line was started by the company to extend

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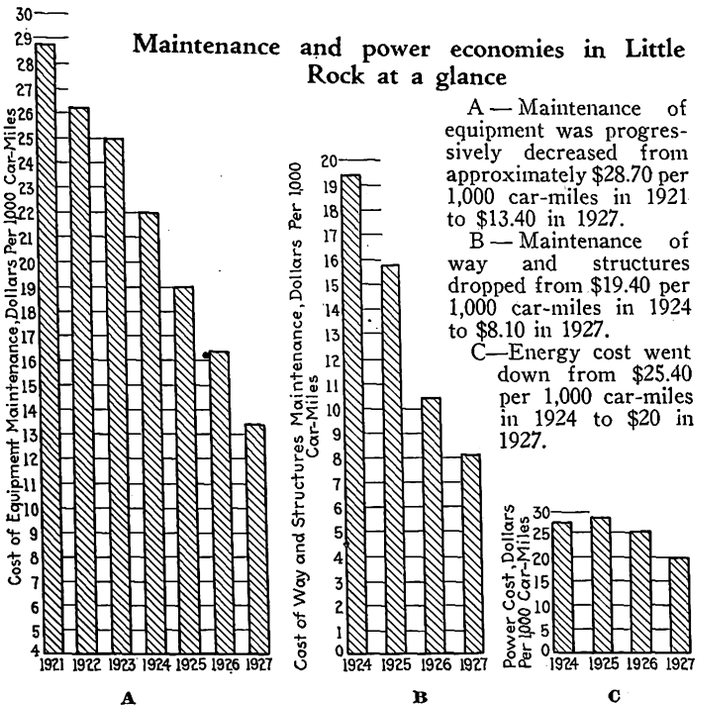
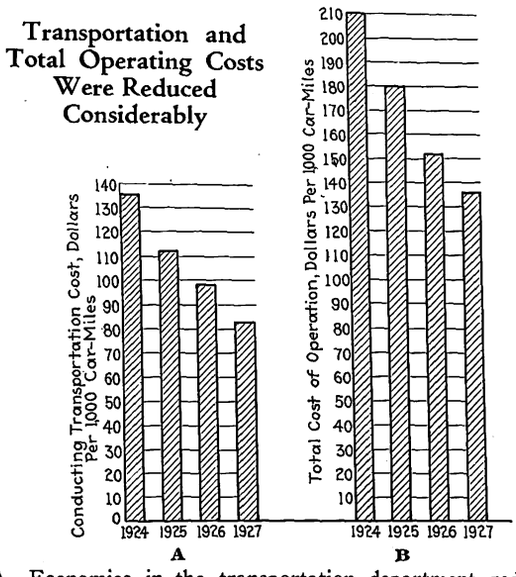




A—Economies in the transportation department reducing the cost of conducting transportation from approximately $136 per 1,000 car-miles in 1924 to $83 in 1927.

B—Total operating costs, including conducting transportation, maintenance of way and structures, maintenance of equipment, power and traffic expense, dropped from $210 per 1,000 car-miles in 1924 to $136 in 1927.

service to two sections of the city not reached by street cars. Thus people living in Pulaski Heights may now go to the west end of the city without having to travel through congested downtown traffic, which means a considerable saving of time.

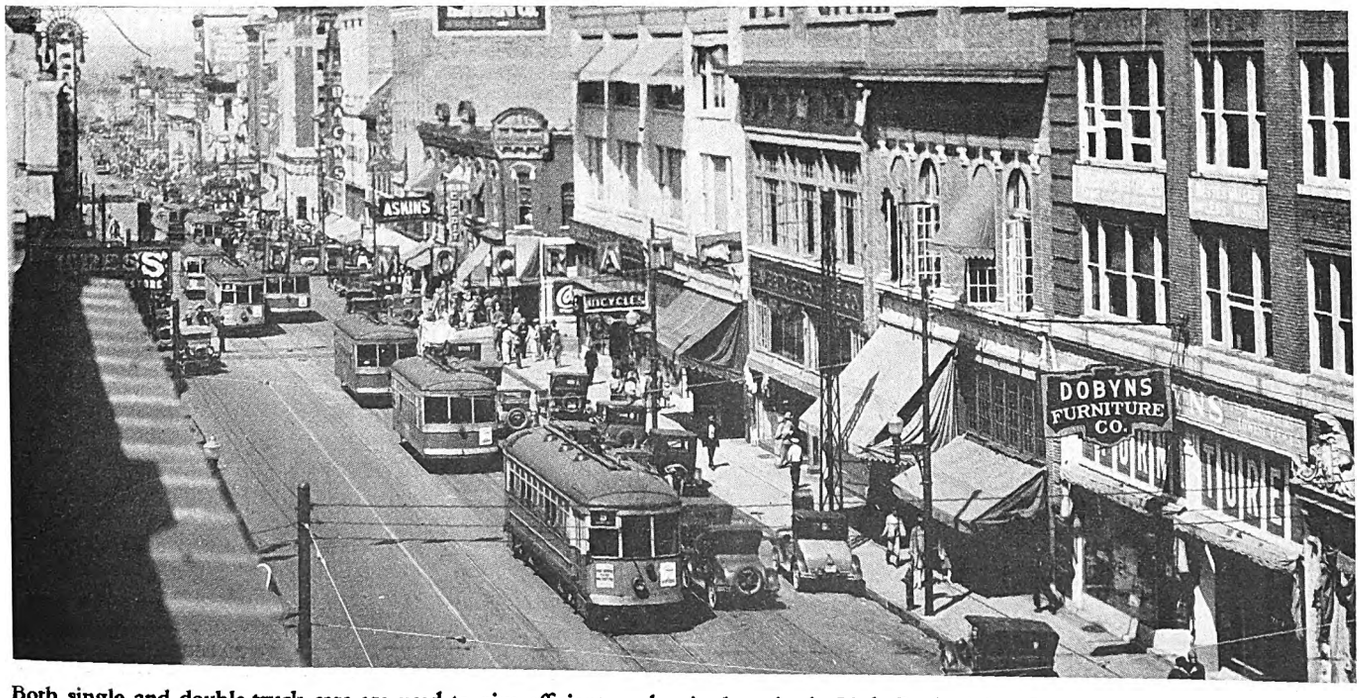
TABLE I—NUMBER OF CARS ON VARIOUS LINES BEFORE AND AFTER ONE-MAN OPERATION

Lines	Number of Cars — Rush Hours Before	Rush Hours After	Base Schedule Before	Base Schedule After
West Fifteenth—Missouri Pacific	8	9	5	5
South Main—Pulaski Heights	12	17	8	8
West Ninth—Rock Island	6	9	5	5
*Fair Park—East Ninth	12	14	6	7
*South Highland—East Fourteenth	7	12	6	6
Biddle	2	2	2	2

*Decreased headways on these lines resulting from the change to one-man cars have produced substantial increases in revenue.

During the year 1925 all the street cars, with one minor exception, were handled by two men. The exception was a line with two cars serving a small industrial section. In 1926 the company began substituting one-man cars in the place of two-man cars and by the latter part of the year the entire railway had been converted to the one-man system. With the change to one-man, the company has followed the plan adopted in many cites of having the name of the operator placed in the vestibule of the car. It is believed that the name plates have done much toward personalizing the service and creating a more friendly spirit between employees and their passengers.

Recent stringent restrictions to downtown parking in Little Rock have caused more people to appreciate the advantages of the street car service. Many persons who



Both single and double-truck cars are used to give efficient modernized service in Little Rock, Ark. One-man operation has permitted frequent headways with resulting increased revenue and reduced expense

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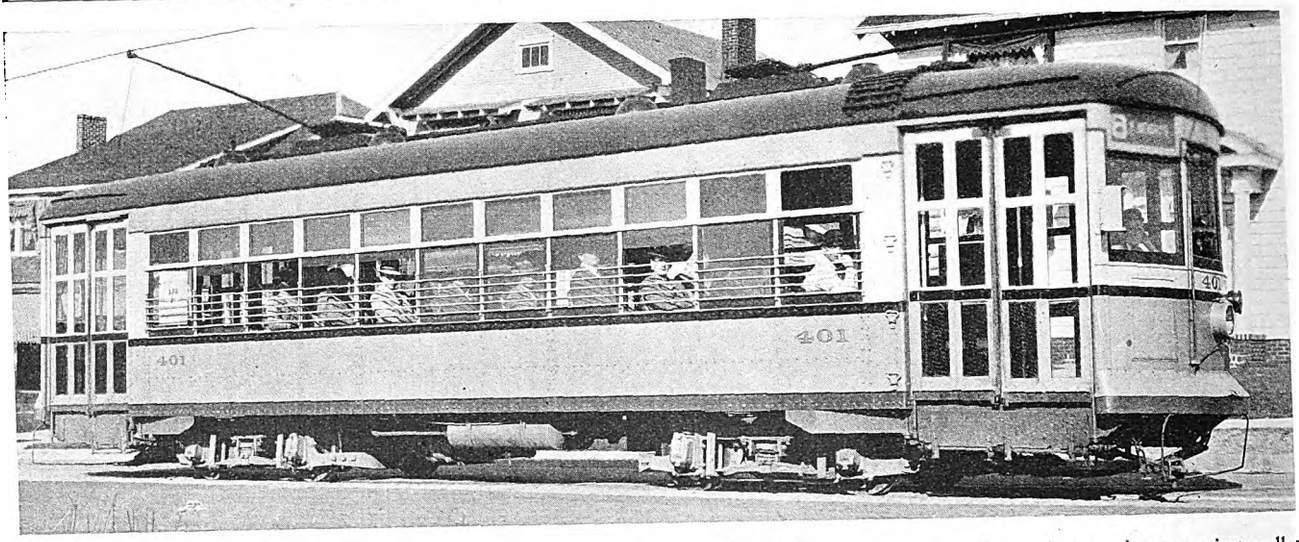


Twenty double-truck cars of this type were completely renovated and equipped for one-man operation. Automatic rear-exit treadles have since been installed on twelve of them

formerly came to work in their automobiles are now using the street cars. To park three blocks from their places of business or else move their cars every hour has come to be regarded as entirely too inconvenient. Matinee fans are also finding that the parking restrictions are a serious drawback to the use of their cars. With the street car lines passing the doors of all important places of amusement, many theater-goers are leaving their automobiles at home.

Coincident with the introduction of one-man service, street fare collectors have been stationed at three of the more important downtown corners which are transfer points. These men issue and collect transfers, sell tokens and make change prior to the arrival of the street cars. It has been found that the collector, during the few moments that he and the company's patrons have together while awaiting the arrival of a car, has an opportunity of making friends for the company and selling its service. With this in mind, particular care has been exercised in selecting these men. This idea was expanded during the holiday season by placing additional uniformed men at strategic points throughout the business section of the city to assist Christmas shoppers in boarding the street cars in the more congested districts. In addition to supplementing the regular fare collectors these men carried bundles, and even babies, from curb to car-loading zones for the street car passengers and rendered such other help as was possible.

Comfortable seats have been ranked of first importance in equipping the cars in Little Rock. Lights, heating, and ventilation are other matters to which particular attention has been given. A schedule of daily cleaning for each car was set up when the new equipment was acquired. Vacuum cleaners are used for the de luxe cars that have upholstered seats.

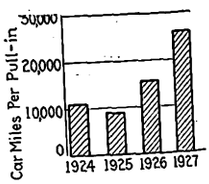
An interesting exhibit which the company arranged for selling its service was that made the week of June 1, last year, in a downtown display window that showed an attractive street scene in which a moving street car figured prominently. The detailed story of this window display appeared in the Feb. 19 issue of the JOURNAL. Thousands of people were attracted by the novelty and considerable favorable publicity was obtained.

An intensive study of car doors and steps has been made in Little Rock in conjunction with the company's safety program. The decline in platform accidents which resulted was most encouraging. Accident figures month by month are shown on an accompanying graph. The Arkansas Power & Light Company was among the first to use rear-exit treadle doors. These were especially desirable in the South because of the so-called "Jim Crow law." By using both front and rear exits, loading and unloading of passengers was expedited and unnecessary mixing of races was avoided. Before the adoption of automatic treadles the cars had front entrances and rear exits operated with pneumatic control.

Power cost for three of the principal city lines was

Car-Miles Per Pull-In More than Doubled

When the cost of equipment maintenance is substantially decreased, pull-ins are a valuable guide in checking the condition in which equipment is being kept. While maintenance cost was reduced from $28.70 per 1,000 car-miles to $13.40, the number of miles operated per pull-in increased during this period from 11,000 to more than 26,000.



Accidents Have Decreased with One-Man Operation

Although schedule speeds were substantially higher with one-man operation in 1926 and 1927 than in 1924 and 1925, when there were two men on the cars, the total number of accidents were substantially decreased and the mileage per accident was increased.

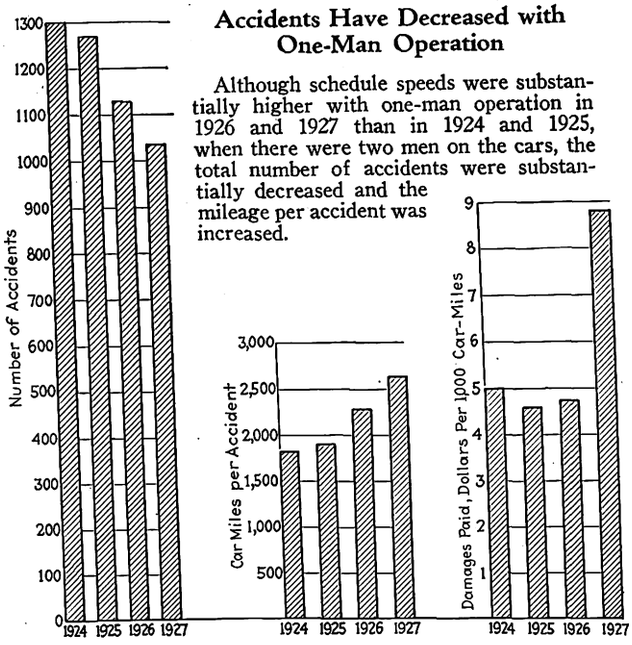


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TABLE II—COMPARATIVE RAILWAY STATISTICS BEFORE AND AFTER ONE-MAN SERVICE BEGAN

	Two-Man Service				One-Man Service	
	1922	1923	1924	1925	1926	1927
Car-miles	2,375,220	2,443,387	2,368,981	2,452,960	2,534,817	2,721,442
Car-hours	271,854	279,444	254,216	257,140	267,771	285,203
Energy consumption, kw.-hr.	8,371,308	9,125,022	9,193,230	9,195,280	8,637,526	8,500,000*
Average speed, m.p.h.	8.74	8.74	9.32	9.54	9.47	9.55

*Approximate.

decreased 30 per cent, it was estimated, by the installation three years ago of an automatic substation. This station was built at a cost of approximately $215,000, and is served by a 13,000-volt line from the company's main power plant. The station is also tied in with an inter-connected high tension distribution network of which the Arkansas Power & Light Company is a unit.

Logging Railroad Is Electrified

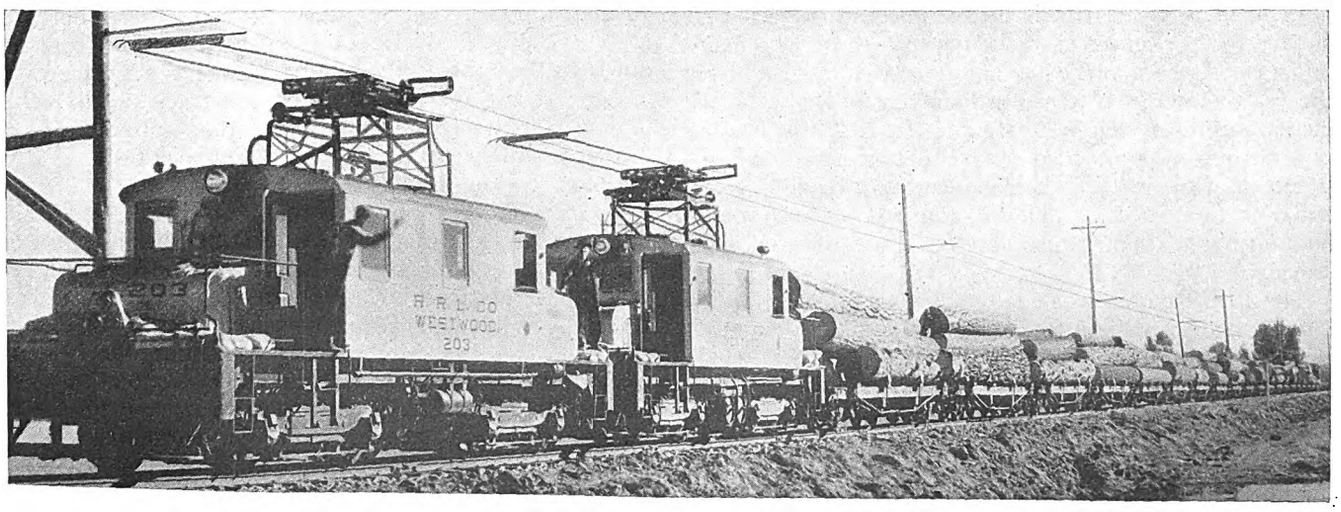
UNIQUE among the electrification programs carried on by many of the short-line railroads is that of the logging railroad of the Red River Lumber Company. The center of operations of this company is at Westwood, Cal., in the heart of the white pine forests in the northeastern part of the state. Nearly 25,000 loaded cars of logs are transported each season to the mill at Westwood from Chester, over 17 miles of standard gage road. In addition to the main line over this distance, there are also four passing tracks, totaling approximately 6,000 ft. in length. The electrification program of the company includes these passing tracks besides the main line. The change-over from steam to electric operation was completed on Sept. 15, 1927. The principal electric equipment includes two 61-ton, 1,500-volt electric locomotives, a two-unit 1,000-kw. 1,500-volt automatic substation, and overhead line material.

The two Baldwin-Westinghouse locomotives are of the steeple cab type and weigh 61 tons each. There are four driving axles, on each of which is mounted a Westinghouse type 582-FE-5 railway motor rated at 200 hp. The motors are arranged for field control and are direct geared. Although each locomotive is a complete unit, the cabs are arranged for multiple-unit operation by means of train line receptacles and jumpers and a power bus line between the two units. The two cabs working in multiple haul 20 loaded cars of logs over the 17-mile main line in approximately 75 minutes, giving a schedule speed of 13.5 m.p.h. for the entire distance. The return trip can be made with as many empty cars as desired, up to a maximum of 50, in approximately 40 minutes. When operating on short field connections with the master controller in the full parallel position, the power peak required by twenty-car trains ascending grades will be approximately 1,265 kw.

The Red River Lumber Company owns and operates power plants, both steam and hydro-electric, totaling 16,000 kva. capacity. In addition to supplying power to their own interests, power is leased to the Pacific Gas & Electric Company. The company's three-phase, 60-cycle, 33,000-volt power line passes the railroad at Almanor Junction. A 33,000-volt branch line has been run from this point to the single substation at the load center of the electrification. The substation contains two 500-kw., 750-volt, shunt-wound, synchronous converters permanently operated in series to supply 1,500 volts direct current to the trolley. With the exception of a remote starting and stopping feature, the station is fully automatic. It is designed to carry 1½ times full load for two hours and a momentary rating of 300 per cent. A selector-type train dispatching system provides the remote control feature.

Because the logging equipment necessitated a large overhead clearance the distribution system was designed with an offset trolley. The trolley wire is 19 ft. 3 in. above the track and offset 9 ft. from the track center. A modified simple catenary suspension is used. For the greater part of the distance, a 300,000 circ.mil copper feeder is utilized as a messenger wire. Two parallel contact wires of No. 0000 copper are used, each of which is supported by alternate hangers. Because of topographical conditions it was impossible to extend the trolley along one side for the full length of the line. To meet this each locomotive is equipped with a double acting side-arm collector, whose normal position is at right angles to the track. Air cylinders move the arm to the right or left as required. A third cylinder brings the collector shoe in contact with the trolley. Pressure against the wire is maintained by tension springs.

Trains of loaded cars are made up and delivered to the electrified main lines by steam and Diesel-electric locomotives. As an overhead system would interfere with the switching of logging equipment on flat cars, these locomotives also handle the trains from the transfer at the Westwood end of the electrification. Empty cars to be returned are handled in a similar manner.



The two locomotives of the Red River Lumber Company pulling a train of twenty loaded cars

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Bonuses Promote Efficiency on Denver Tramway

Trainmen with satisfactory records at end of the month receive a bonus of 2 cents per hour. Five banquets are tendered each year

YEARS ago a merit and demerit system was adopted on the Denver Tramway System. The plan of giving minus points for rule violations and giving plus points for good records has proved an effective means of securing safe and efficient operation on the system. The trainmen with good records are given a cash bonus at the end of each month and, in addition, a banquet is given at the end of each three months for the division with the best record. Also, a banquet is held each year for the trainmen who have maintained a clear record for each month during the year.

From one-half to ten minus points are assessed against a trainman for any violation of a rule. A violation deserving a greater penalty than ten points means discharge. For operating any one month without minus points, five plus points are allowed. If the trainman has less than five minus points, the difference between the number assessed and five are given as plus points. The plus points give a trainman an opportunity of reducing the number of minus points or clearing his record entirely. A permanent trainman, after serving a six months' probationary period, is given a bonus of 2 cents per hour, providing his record shows ten or less minus points at the end of the month.

An additional bonus, competitive by divisions, of which there are four, is offered in the form of a banquet to the division operating most efficiently for a three months' period. The divisions are judged by the following rating:

Item	Per Cent
Adherence to schedule	35
Reduction of accidents	20
Energy saving	20
Reduction of complaints	10
Appearance of trainmen	5
Appearance of equipment	5
Condition of division headquarters	2
Reduction of guarantee paid	2
Reduction of division expense	1
Total	100

Besides the four banquets held annually for the most efficient divisions, a fifth is held at the end of each year for the 100 per cent men of the system—those who maintain a clear record at the beginning of each month during the year. Interest in these banquets is indicated by the increase in those eligible to attend. In 1926 the 100 per cent banquet was attended by 168 out of a total of 774 trainmen, while in 1927 the banquet was attended by 257 out of a total of 776. These banquets are enjoyed by both men and management and a spirit of good will prevails.

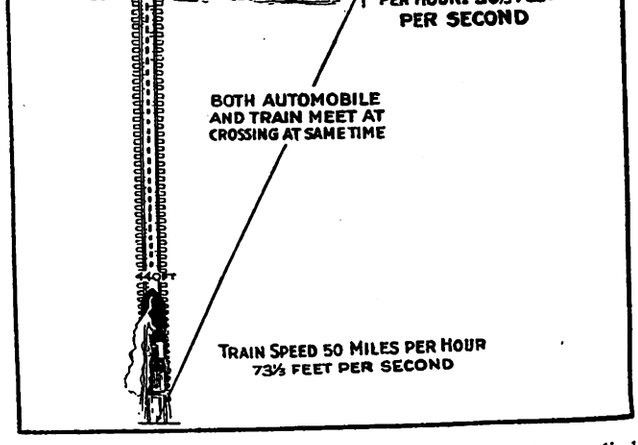
The 1927 banquet was held at the Albany Hotel, with Superintendent of Transportation J. L. Adams, as toastmaster. He introduced the officials and department heads of the company, including the president, chief surgeon, general attorney, chief engineer, auditor, purchasing agent, superintendent of power, traffic manager, claim agent, property agent and the assistant treasurer—all men with whom the trainmen do not often come in contact in the course of their work.

The outstanding number of the program was an address by President H. S. Robertson, which consisted of a review and explanation of the litigation with the city concerning fares and franchise rights. The trainmen welcomed the talk as a matter of information and appreciated the confidence reposed in them by a personal explanation of the corporation's side of the question.

A. Downing, representing the trainmen, spoke on the troubles of a trainman, or the effort required to maintain a 100 per cent record. With a liberal amount of entertainment by home talent to top off the evening, the banquet was pronounced most enjoyable.

A Deadly Geometrical Proposition

UNDER the caption "Let the Train Pass" the *Pennsylvania News*, employees' newspaper of the Eastern region of the Pennsylvania Railroad, invites the reckless driver to figure out this mathematical problem. It has



two answers, death or safety, and may well be applied to the interurban grade crossing. The drawing is credited to the Aetna Life Insurance Company.

Automatic Switch and Shift of Motormen Reverse Train in 30 Seconds

IN THE subway system at Sydney, New South Wales, Australia, an ingenious system has been adopted for turning the trains at St. James Station, where there are stub tracks and crossovers for passing trains from the down to the up-track. After a train has discharged its passengers at this station, an automatic track switch passes it to a stub track, after which another automatic track switch permits it to proceed in the opposite direction to the platform on the other track.

To economize time, motormen are changed during the process. The motorman who is to take the train on the return trip boards it at the rear platform of the last car at the platform where passengers are being discharged. While he is adjusting his equipment the motorman who has been in charge of the train runs it on to the stub track. On the return trip, the second motorman, who is then at the front end of the train, runs it to the loading platform where the first motorman leaves to cross the tracks and take another train back.

The time required in the whole operation of reversing the train is only 30 seconds.

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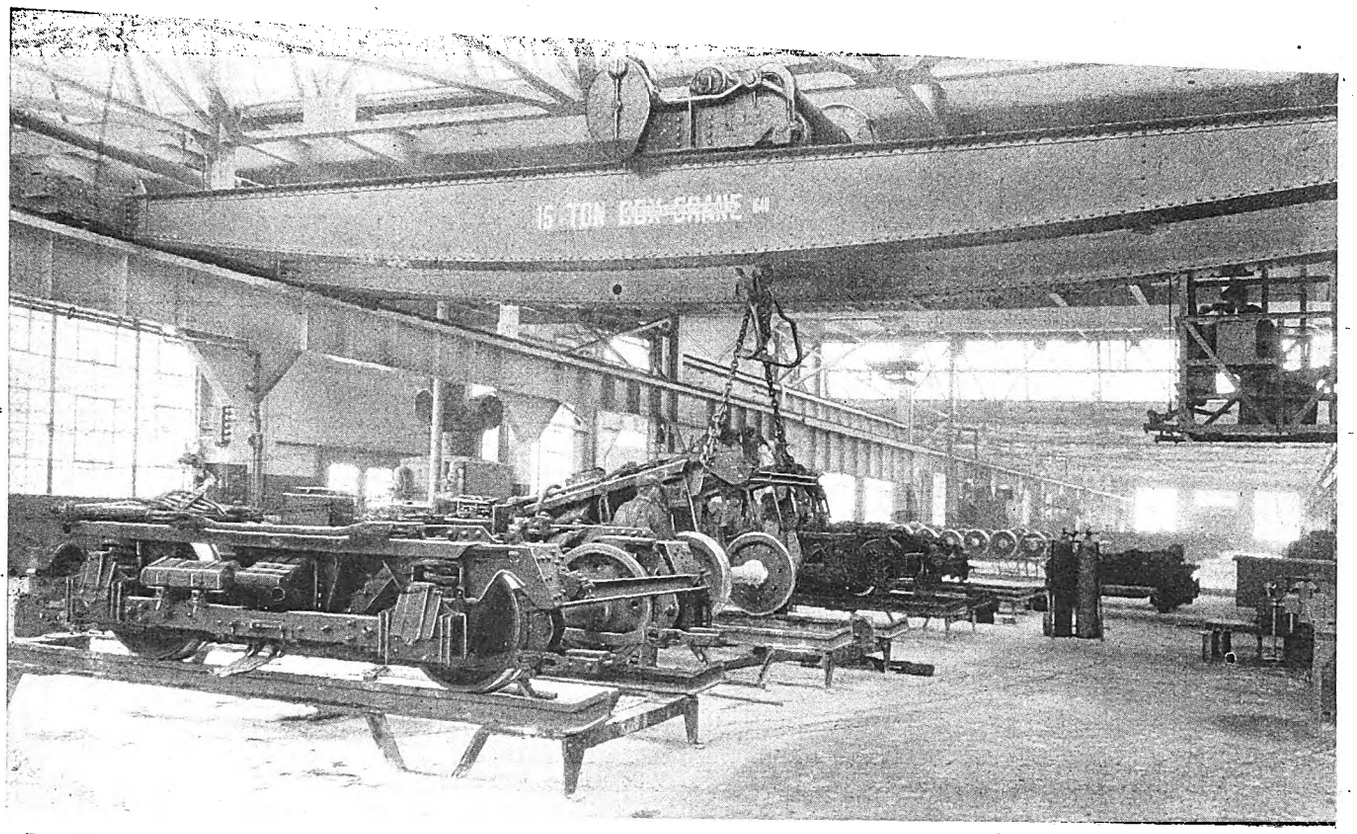

Installing a pair of wheels in a truck in the intermediate repair section of the Coney Island shops. Repair work is done with the trucks on stands, to raise them to a convenient height for the workmen

TRUCK REPAIRS Put on a High-Speed Basis

By Clarence W. Squier
Associate Editor *Electric Railway Journal*

In the intermediate truck repair section of the Brooklyn-Manhattan Transit Lines' Coney Island shops repaired trucks are substituted immediately for those removed so that cars are not withheld from service

WHEN repairs to car trucks of the Brooklyn-Manhattan Transit Lines are necessary between regular overhaulings, they are made in the intermediate truck repair section of the Coney Island shops. The methods used are quite different from those common in other railway shops in that trucks are changed from one car body to another. Cars whose trucks require repairs are not withheld from service but are brought into the shop, the defective trucks are removed and replaced by others in good condition, and the cars are then returned to service without delay.

In considering this method it might appear that a large number of spare trucks would be needed. On the contrary, as the work is carried out on the Brooklyn-Manhattan Transit Lines, only six spare trucks have been found necessary, besides those actually required for car bodies, to take care of the truck repairs for the 900 subway motor cars, 50 subway trailer cars and 121 triplex units which are operated on the system. The reason is that trucks from cars which are in the shop for general overhauling and repainting are used to carry out truck repair work. This releases enough trucks so that twenty can be placed in the repair section and worked on at one time.

The facilities and methods used make it possible to carry on the truck repair work continuously and to organize the shop forces along the most effective lines. Returning cars to service quickly or making them available for service without delay is the feature around which the plan for repair work has been built. Any additional cost for spare equipment to carry out the program will be met several times over by the added revenue from the increased service obtained from cars.

The intermediate truck repair section is 480 ft. x 80 ft. This long section has an electric drop pit transfer table,

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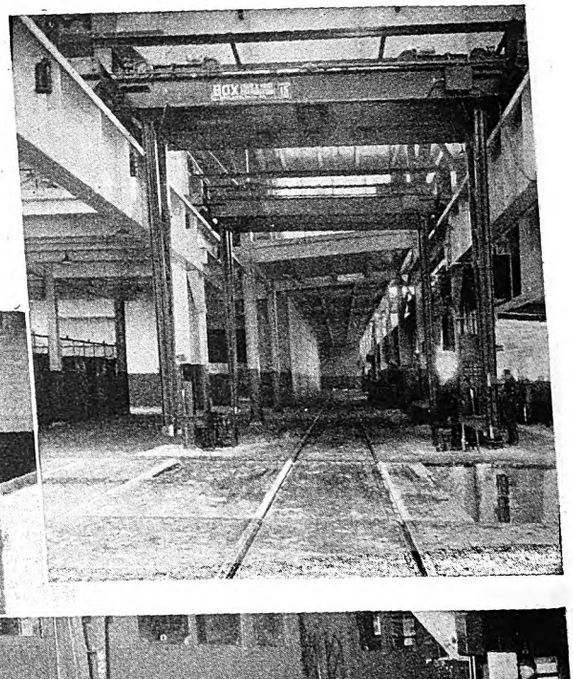
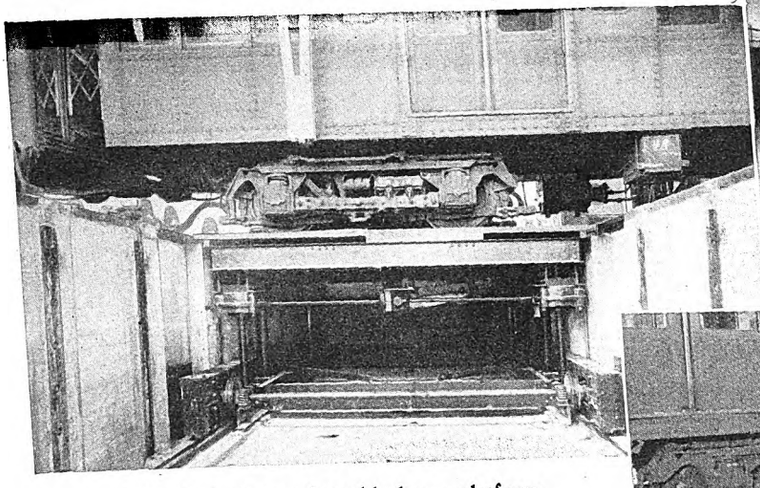
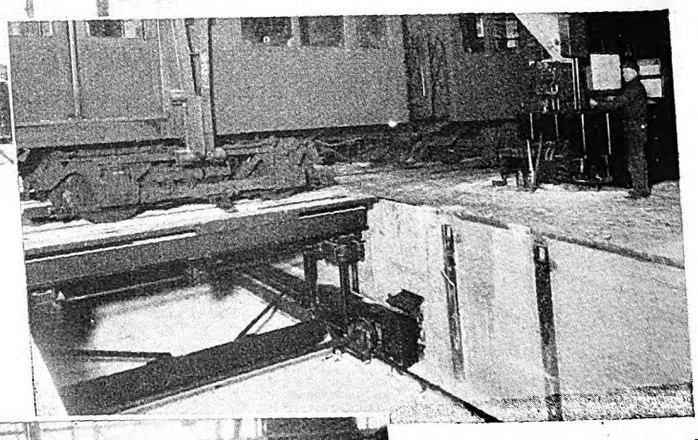
For removal of trucks, cars are brought into the repair section on a single track with a drop-pit transfer table at the center. Two overhead cranes operate in conjunction with the drop-pit transfer table for truck removal

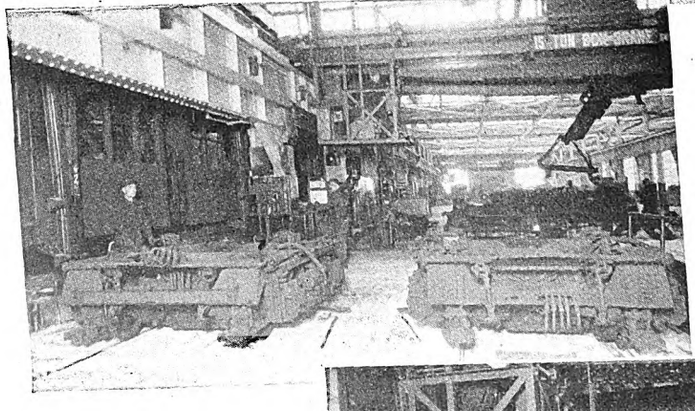




The drop-pit transfer table has a platform that raises and lowers. Longitudinal motion is provided by moving the entire table on rails at the bottom of the pit

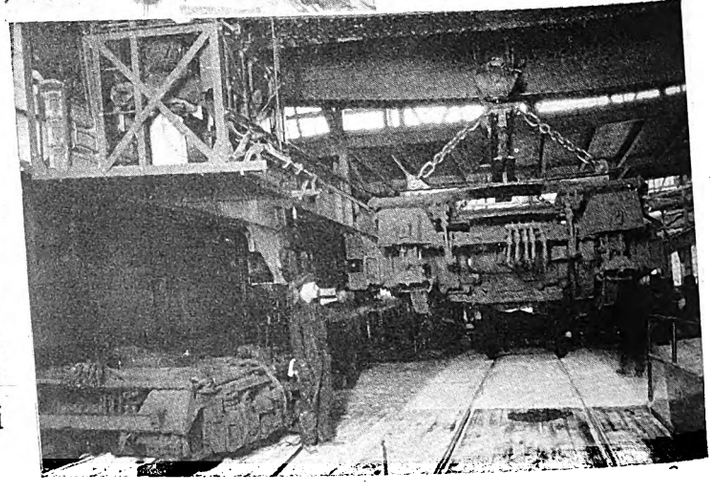


The transfer table is provided with two tracks so that one truck can be moved into position for installing at the same time that another is removed from the car



The entire operation of dropping out a truck is controlled from a station alongside the drop-pit table

Overhead traveling cranes handle trucks between the transfer table and the truck repair stand



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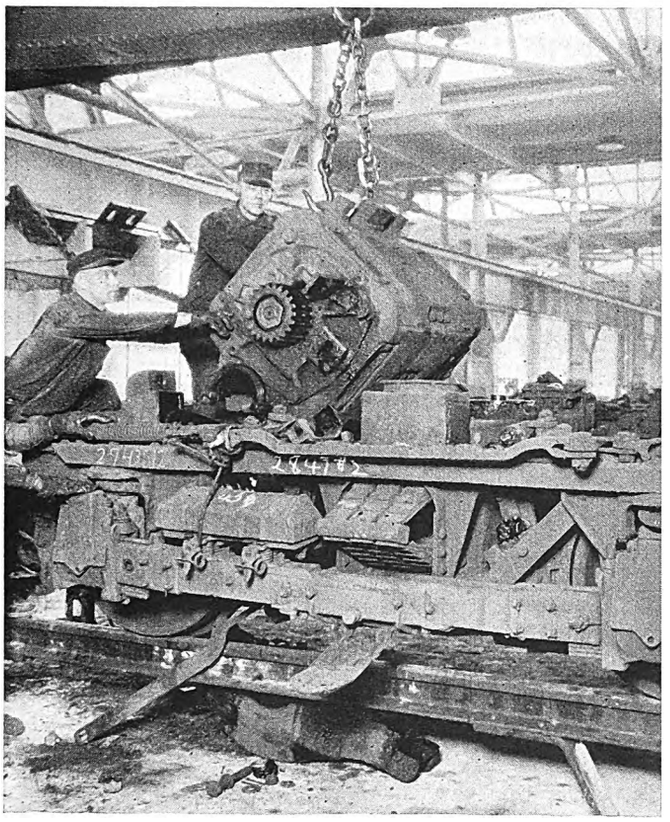


Workmen guide the motor so that the motor axle suspension seats properly as the motor is handled by an overhead crane

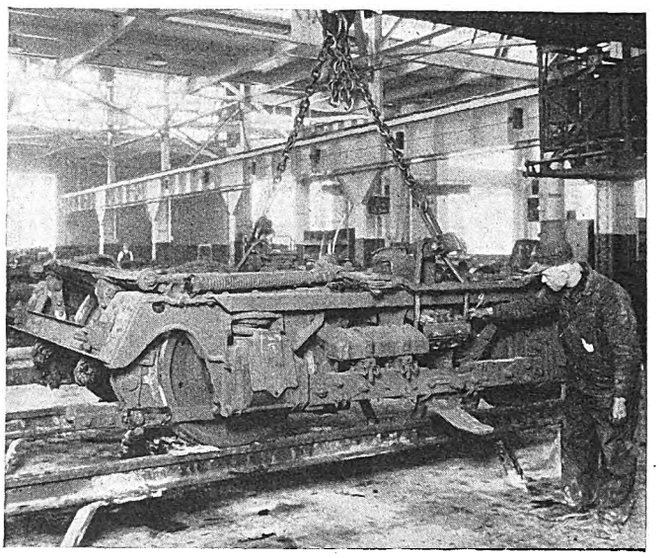
which runs across its center. All trucks enter and leave the repair department by this transfer table, being handled to and from the twenty repair stands on which the work is done by two 15-ton, overhead-traveling, cranes. Ten of the truck repair stands are placed in each of the sections on either side of the transfer table. Along the two sides of the section are numerous cabinets, material racks and bins, workmen's benches, machine tools, rivet heating furnaces and miscellaneous equipment used in the repair work.

Motor leads and brake rigging of trucks which are to be repaired are disconnected in the inspection shop, which adjoins the truck repair section, so that removal is easy. Most of the subway cars of the Brooklyn-Manhattan Transit Lines are operated in groups of three. These

Bolts are installed under journal boxes quickly by means of a lever attachment that compresses the spring between the truck frame and the top of the journal box

are handled as units, being kept together and shopped at the same time. Whenever it is necessary to remove a particular truck the three cars are brought in.

The track over which the cars come in has an electric drop-pit table, supplied by the Whiting Corporation, Harvey, Ill. This is operated in conjunction with two special overhead cranes supplied by the Box Crane & Hoist Corporation, Philadelphia, Pa. The cranes have L-shaped hooks to support the car body while a truck is removed or replaced. When removing a center truck from an articulated unit it is necessary to support the ends of two car bodies at the same time, so there are two 15-ton overhead cranes with two sets of supporting arms. The crane equipment extends over the truck removal track and is fitted with trolleys and appliances for convenient operation. The cranes are equipped for longitudinal and transverse movements but not for vertical motion as this is taken care of by the drop-pit table. The entire equip-



Stirrups fit over the ends of elliptic springs and lifting by the crane compresses them so that they fall into position readily

ment for the overhead cranes and the electric drop-pit table is controlled electrically from a station on the floor alongside the drop pit.

The electric drop-pit table is supported on four upright screws. The lower ends of these screws rest in blocks in a wheeled truck which runs on a track in the pit. Motors for the raising, lowering and transverse movements are mounted on the table, but are controlled from a stand on the floor of the overhauling shop. Locking bars take the live load while the train is moving across the table.

After the train has been placed so that the truck to be removed is in the center of the table, the table is elevated enough to give clearance for easy insertion of the body holding hooks from the crane. The locking levers are then released. There is an electrical interlock so that the table cannot be lowered until the locking bars are entirely unlocked or locked. The table is then lowered to give clearance for removal of the truck, and then, along with the truck, it is moved transversely.

As the transfer table has two surface tracks a truck in good order can be placed on one track before a train is brought in while the truck being removed will be placed on the other track. The transverse movement of the drop-pit table which takes out the defective truck then

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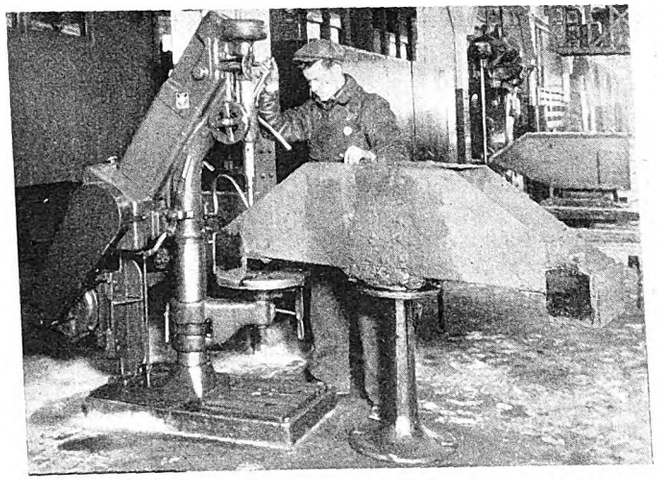


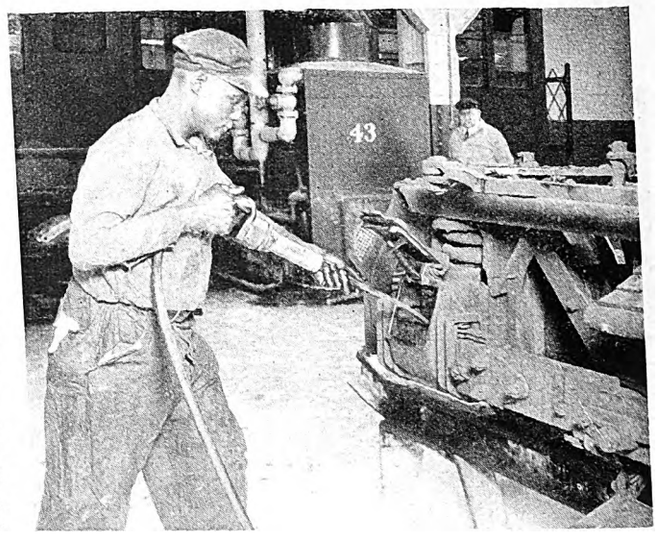
With a truck bolster on a special stand the drilling for filler blocks is done quickly

brings the second truck into position, so that the table can be raised again and the new truck placed in position under the car body. The shop section adjacent to the pit table has three short spur tracks which line up with those on the table in either of its two stationary positions. Trucks can thus be run on and off the table and left on the spur tracks until it is convenient to handle them with the traveling cranes. A truck can be dropped out of a car and a new one installed in a very short time without uncoupling cars.

Control equipment has been ordered for this section so that trucks can be moved to and from the transfer table under their own power. This equipment consists of contactors and resistors controlled from push button stations alongside the tracks. A single lead will supply power to the truck to be moved.

At present the truck repair section has a working force of 20 men during the daytime and 21 men at night and the section repairs an average of from 20 to 25 trucks per day. Running repairs are made only and no general overhauling is attempted. Some of the defects which require removal and repair of trucks are grounded or flashing of motors or armatures, burned off motor leads, grounded brush-holders, worn wheels or those with sharp flanges, worn spring-plank hangers, worn shoe head hangers, broken or worn axle bearings, loose rivets and worn pedestal liners.

A simple but effective record system is used for notifying the shop that repairs are required, for ordering in the cars, for supplying information for a permanent rec-

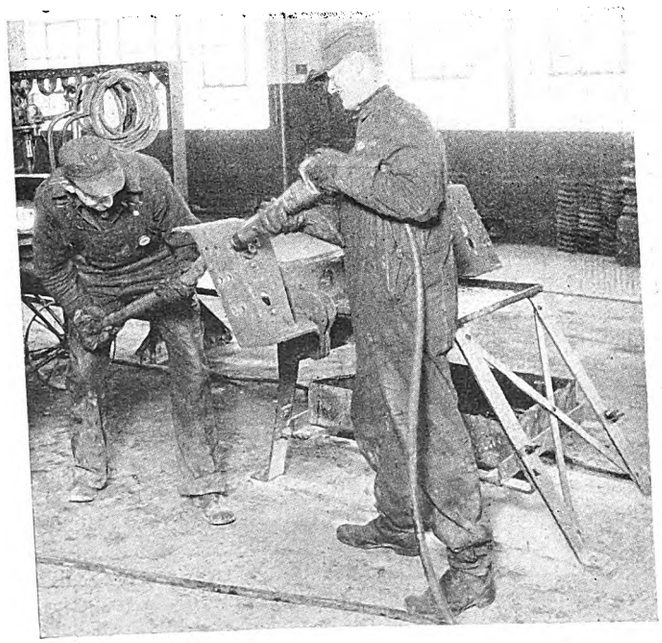


Journal boxes are packed with a pneumatic gun. This method is less fatiguing to the workmen and gives tighter packing for the waste

ord of truck or motor changes, and for showing the class of work done during each repair period. Two card record systems give immediate information as to the location of any particular truck. One of these is arranged by car numbers and the other by truck numbers. The car cards show the trucks in and out together with dates. The truck cards give the number of cars in which the trucks are installed or removed together with date. The drop table operator records the trucks as they are removed and installed. There are two sets of books so that one may be worked on in the office, while the other is in use at the transfer table. These books are arranged with columns for the number of the truck, the car from which it is removed, the time of removal, the number of the truck which is used for replacement, and the time that it goes under the car.

Attention has been given to labor saving tools so that the men may work efficiently, and so that many of the operations may be performed by a single man, where otherwise several would be needed. Many devices have also been worked out to assist in doing the work quickly and with few men. One example of such equipment is a lever device which is used to compress the coil spring underneath the truck frame and on top of the journal box while a binder bolt is put in position under the journal box. This device, shown in an accompanying illustration, has a block which rests on the truck frame. The short end of the lever has a link with a hooked end which fits into the inside of the wheel rim. A man pushing down on the extreme end of the lever can then compress the spring sufficiently so the binder bolts can be put in position.

Fixtures are used for seating the elliptic springs in position in the spring plank and also in the bolster. To



The riveting crews make up ends for truck frames and bolsters when not working on the trucks

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Rules to Guide Executive Action

Pamphlet on executive duties issued by North Shore Railroad. Somewhat similar rule books on proper treatment of customers also published for the use of ticket agents and one-man car operators

PART of the service improvement program of the Chicago, North Shore & Milwaukee Railroad has been the development of a rule book on executive standard practice, outlining the duties of the executives. The book is divided into five sections and contains a collection of principles for supervisory men to follow in their relations with subordinates. Rule books along the same lines have been prepared for the use of ticket agents and safety car operators.

The book on executive standard practice is the result of sixteen conferences conducted with the supervisory force of the company by those in charge of the company's service improvement program. The purpose of these conferences was to develop the best methods of obtaining from employees the prompt and faithful execution of all orders, and at the same time, of fostering a spirit of good-will and co-operation between employers and employees.

The conference method was used in securing this information because it seemed the least formal and most effective way of obtaining it. Stenographic notes were made at the conferences, and sufficient discussion developed on each of the various topics to give a composite idea of the opinions of those in the group interviewed on the best way of meeting various definite situations. At the close of the conferences, each person attending received a questionnaire on the subjects considered, and was asked to fill it out and return it. Later, the replies from these questionnaires were combined with the stenographic notes of the interviews to form the basis for the pamphlet on standard practice. The question and answer form was used, because it was thought to be most easily read and to be more interesting than cold statements.

The pamphlets on standard practice for ticket agents and safety car operators were developed in the same way. The conference leader used a carefully prepared outline, so that the conferences could be properly directed and controlled.

To ascertain to what extent the pamphlets are read and understood, checks are conducted from time to time. Questions based on the pamphlets are asked in printed form and three answers, one of which is correct, is furnished for each question, the employee being asked to check the answer which he thinks is correct. In this way, much time is saved. As a matter of fact, a review check for safety car operators requires only one hour and 45 minutes, whereas if the operators had simply the questions before them and had to write the answers, much longer time would be required, and the work in itself would be less interesting.

Contents for Executive Practice Pamphlet

This publication contains a collection of the principles intended to guide all the men in the company in supervisory work in their relation with subordinates. The company realizes that a mere knowledge of the principles will not in itself make a man a capable executive. To be so requires courage, intelligence and other important qualifications, such as character and personality. However, it is believed that the executive who takes up these principles one by one to study and use them in a practical way will find himself gradually becoming a better leader. It is also understood that the material is suggestive only. In executive work it is believed to be difficult if not impossible to make a set of hard and fast rules. The principles can be expressed, but good judgment in applying them is essential.

The book on executive practice is divided into five sections, called respectively, "Orders and Instructions," "Enforcing Orders—Discipline," "Getting Work Done," "Building Morale," and "Relations Between Executives and Subordinates."

The first section relates to the method of giving orders and seeing that they are carried out. As it is not, of course, the purpose of this article to reproduce the contents of the pamphlet, only one excerpt will be made. It is of the first seven questions, with their answers, which follow:

Excerpt from Standards of Executive Practice

Section 1. Orders and Instructions

1. For what seven reasons do employees fail to carry out orders properly?

(a) Failure to understand because the order was not given properly and clearly.

(b) Forgetfulness, because so many orders are issued and issued so rapidly that some are overlooked.

(c) Inattention when order was given, or carelessness in reading written orders, because of a back-history of orders being issued and not followed up to see that they were carried out.

(d) Indifference because the proper disciplinary measures were not taken when previous orders were disregarded.

(e) Under-estimating the importance of the order.

(f) New men coming in have not seen the orders.

(g) Too much or too hard work is given.

2. In what ways can an executive avoid these seven difficulties?

(a) By giving or writing orders clearly and accurately.

(b) By issuing only such orders as are necessary.

(c) By following up the orders to see that they are carried out.

(d) By calling the attention of employees to their mistakes or failure to carry out orders.

(e) By taking proper disciplinary action if orders are ignored.

(f) By explaining reasons for orders so that employees will realize their importance.

(g) By seeing that new men are advised of former instructions, and, if possible, furnished copies of standing orders.

(h) By being sure that the employee is able to carry out the order.

3. What must I do to make my orders and instructions clear?

(a) First, picture to myself the whole situation, step by step, and know exactly what I want done.

(b) Avoid using technical terms, railroad slang, or big words, unless I am sure they will be understood.

(c) Continue to explain (if oral) until I am certain that the man understands.

(d) In written instructions, avoid being concise at the expense of completeness.

(e) Use illustrations, where appropriate and necessary.

(f) Explain the reasons for giving the order, when possible.

4. How can I tell when a man understands my instructions?

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(a) I can watch his facial expression to see whether he looks blank and puzzled or intelligent. I will not depend entirely upon this method.

(b) I can ask him if he understands, but he may hesitate to confess that he does not.

(c) I can judge his understanding by the questions he asks.

(d) I can ask him to repeat the instructions. He may remember them well enough to repeat them but this does not always mean that he understands them.

(e) I can have him explain what he is going to do. This is usually better than having him repeat.

(f) I can have him show me what he is going to do. Very often it is not possible for him to do this. This works best when there is an operation which he is to repeat many times.

(g) I can ask him questions and his answers will show whether he understands. These questions should come at the problem from a different angle so that he will not know the correct answers unless he understands how to carry out the instructions.

5. What are the advantages of giving reasons for my orders and instructions?

(a) Knowing the reason makes it possible to carry out the instructions more intelligently.

(b) If the man knows the reason for doing the job, he may be able to suggest a better way of doing it. He begins to learn to think for himself.

(c) The work is more likely to be done well.

(d) If the man knows the reason he will realize the importance of the orders and be less likely to neglect them.

6. Do executives, on the whole, give reasons for their orders too often or too seldom?

Too seldom. Orders are much more likely to be explained too carelessly than too painstakingly.

7. How can I get my subordinate to ask freely about points he does not understand?

(a) Tell him, when talking with him for the first time, that no one can learn everything at once and that I expect him to have many questions; if there is anything about which he is at all doubtful I want him to come and ask me.

(b) Make it clear that no one ever learns everything about any job.

(c) When I am explaining, ask "Have I made that point clear?" instead of "Do you understand that?" He will realize that I assume it is my job to make him understand and if he does not understand it is because my explanation is not clear.

(d) Make clear to him that the person who never comes for help is the one who needs help but doesn't know it.

(e) Let my subordinates know that if I make mistakes I am willing to admit them. I can best do this by admitting error in their presence when I find I am wrong.

(f) When my subordinate comes to me for help, let him know I am glad he came and that I want him to come any time he is in doubt.

The second section outlines the correct way of maintaining a balance between strictness and leniency, of delivering reprimands, of explaining to employees how to correct mistakes, and of determining the extent of the discipline for improper work.

The third section relates to methods of laying out work for employees, the extent of the personal help which the executives should give and methods of getting work done by employees in other departments.

The fourth section contains suggestions for the ways in which an executive can earn the confidence of his subordinates and teach them to develop initiative and otherwise build up a morale. The final section is devoted to relations between the executive and his subordinates, the extent to which he should enter into their social activities, how he may settle disputes between them and similar matters.

Practice Standards for Ticket Agents and Car Operators Outlined in Similiar Pamphlets

The standards of practice for ticket agents are divided into five divisions: "Interest in the Customer," "Quality of Information," "Speech," "Politeness" and "Appearance."

The first section gives hints as to how to recognize certain types of customers, such as daily riders, occasional riders and strangers, and how to help each kind; how to assist timid or elderly patrons, foreigners, customers in a hurry and people with children; suggestions on how to talk over the telephone, methods of dealing with angry or grouchy customers, etc.

The chapter on information lists the data which the agent needs to have about the service and things outside the service, suggestions on common mistakes made by agents, either in the way of giving too much information or not making the information clear, etc.

The chapter on speech tells the kind of tone to use, the importance of speaking distinctly, the common causes for poor enunciation, suggestions on selection of words to adults, children, and persons with little education, etc.

The chapter on politeness gives not only general rules but suggestions for special instances, as how to acknowledge a customer's thanks, what to do when the agent has to leave the customer suddenly, close an interview or refuse a request, and what to do when he cannot hear what the customer says.

The final chapter discusses what is meant by neatness of person, neatness of clothing and personal habits, and ways of maintaining good appearance while at work.

The safety-car operators' book was prepared primarily for the men at Waukegan and relates almost entirely to methods for maintaining good public relations in distinction from the information on operation contained in the usual rule book. The chapter headings are the same as in the handbook compiled for station agents, namely, interest in customers, quality of information, speech, politeness, and appearance. The topics are treated differently, of course, and relate to the duties of a trainman, rather than that of a station agent.

Keeping Coal Wagons Off the Car Tracks

EFFECTIVE co-operation between the United Railways & Electric Company of Baltimore and the Pikesville, Md., Improvement Association has been shown by the efforts of the latter organization to prevent tie-ups to cars. Printed cards of the type reproduced herewith have been distributed to members of this association. Whenever one of them sees an instance where a coal wagon blocks traffic, he makes out one of these cards and sends it to the coal company responsible.

PIKESVILLE IMPROVEMENT ASSOCIATION
PIKESVILLE, MD

.....192....

Gentlemen—

Our association is appealing to coal companies to cooperate for faster trolley transportation, believing the companies will do their bit by making deliveries along arterial streets in other than the early morning and late afternoon rush hours.

Slow travel and tie-ups on the trolleys cause reduced patronage, and reduced patronage brings higher carfare to those who depend on the cars. Riders rage inwardly when a coal truck holds up a line of cars, containing perhaps several hundred people. It is a mark of a hick town.

A delivery truck of your company today held up traffic on.....St. near.....St,. at about.....o'clock. We hope this happened through an oversight on your part. In fighting tie-ups, can't we depend on your company's aid?

Yours very truly,

TRANSPORTATION COMMITTEE.

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Fighting Snow on Rapid Transit Lines

Boston Elevated employs special equipment and methods peculiar to third-rail operation and the location of the tracks

REMOVAL of snow and sleet on the rapid transit lines, though done in a different manner, is as important as on the surface lines. Many problems must be met, such as keeping the third rail free from snow and ice, sweeping the snow from the car roofs before it thaws and freezes to form icicles, removing snow from the elevated structure and maintaining schedules. To fight the snow effectively on its rapid transit lines, the Boston Elevated Railway, Boston, Mass., uses special equipment and methods.

At the beginning of a snow storm men are dispatched from the maintenance division to watch the switches at junction points, in yards and terminals, and at other locations requiring special attention. Men are assigned, also, to assist station attendants in keeping station platforms and stairways clear of snow and ice.

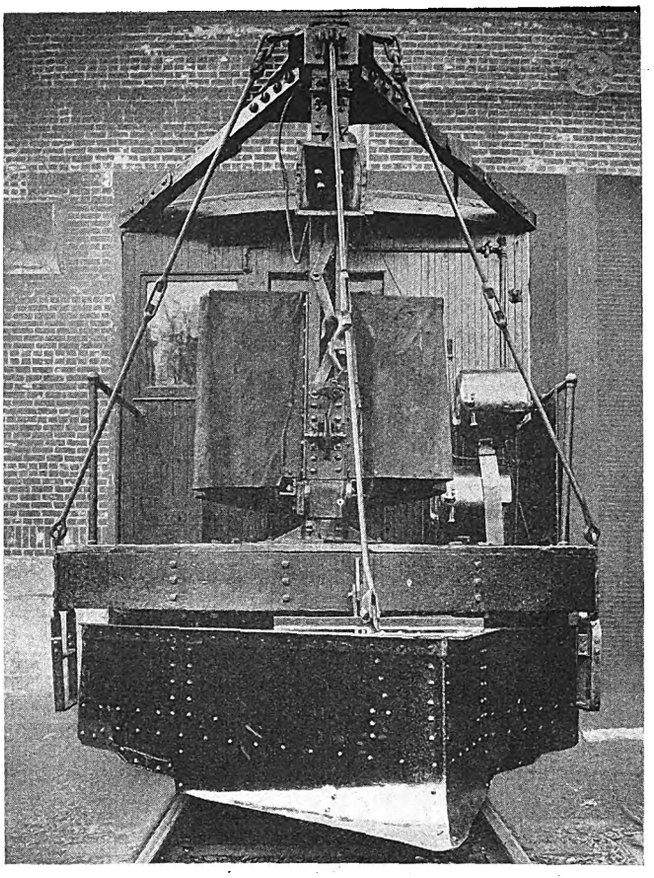
At the finish of the storm the snow is removed from yards, station roofs, subway and tunnel approaches, the East Cambridge viaduct and the Lechmere Square terminal, as well as the car roofs and the elevated structure.

Brushes Used to Clean Third Rail

The accumulation of snow on car roofs is removed to prevent the formation of dangerous icicles and interference with the action of car doors. For this purpose, small platforms are erected on either side of one of the tracks in the Sullivan Square yard and men with brooms quickly remove the snow as the trains are run by the platform.

A track car with special brush equipment is run over the line from Everett to Forest Hills to clear the elevated structure of snow. This removal eliminates the danger of icicles, which form during thawing and freezing periods, and makes the structure safe for track walkers and inspectors. Snow plows have been attached to a motor work car for plowing the Dorchester rapid transit extension when necessary.

To prevent the formation and accumulation of sleet on the third rail, each of the elevated and Cambridge-Dorchester cars is equipped with eight brushes, two attached to each third-rail shoe-beam. They are so arranged that they can be lowered to the third rail when needed. The dimensions of the brush head are $8\frac{1}{4}$x$3\frac{1}{2}$ in. It is made of hard wood and in it are set 540 flat steel bristles.

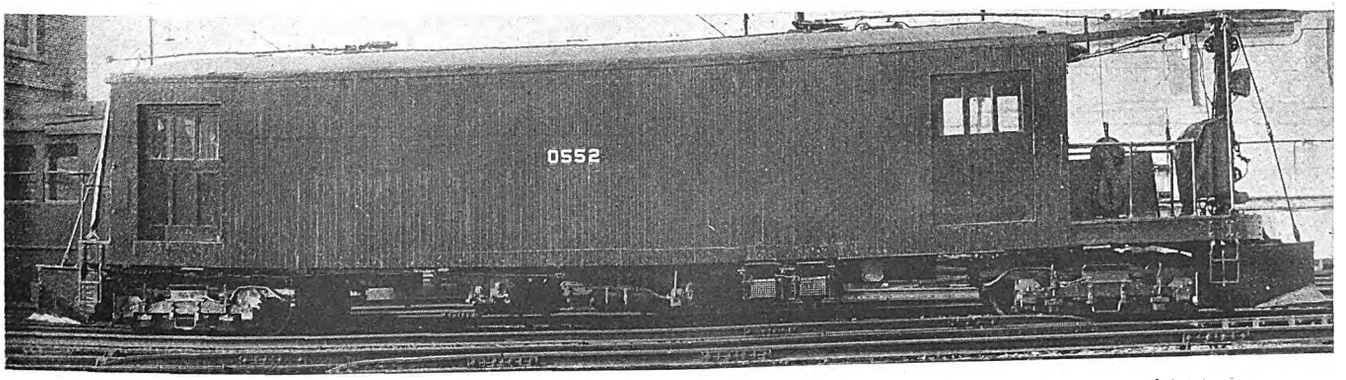


End view of the work car with snow plow used during severe storms

The bristles project $3\frac{5}{8}$ in. and are on a bevel. A spring arrangement provides about 40-lb. pressure on the brushes when they are in position. When not in use the brushes are elevated 1 in. above the third rail. The brush equipment is installed on the cars about Nov. 15 and removed about April 1.

Four flat cars on the elevated line and four flat cars on the Cambridge-Dorchester line also are equipped with these snow brushes, from five to seven brushes being provided on each shoe-beam. The flat cars are pushed ahead of the passenger cars and are used only in severe storms.

Hydro-carbon oil burners are used for removing the sleet, when the accumulation gets beyond the capacity of the brushes. Hydro-carbon oil, sometimes called "liquid fire," is approximately four times as inflammable as gasoline and when ignited gives off an intensely hot flame. It is very effective in removing sleet from third-rail or track switches. The oil containers have a capacity of



Snow plows have been attached to a motor work car for use on the Dorchester rapid transit extension

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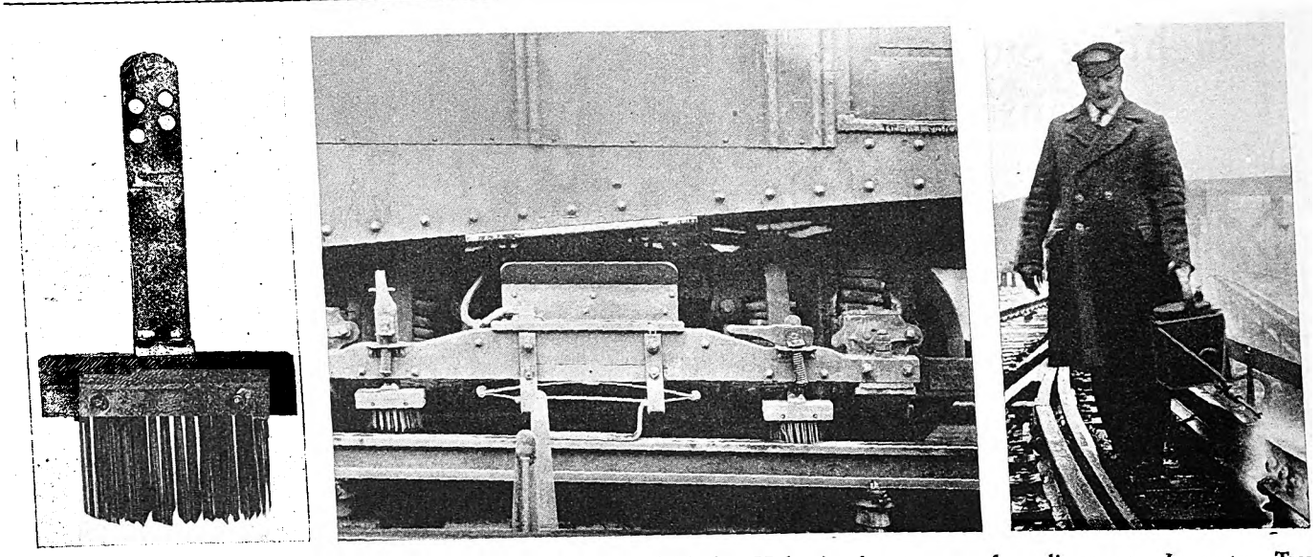


***At left*—The brush is made of flat steel bristles set in a hard wood block. Holes in the stem are for adjustment. *In center*—Two snow brushes are provided for each of the four third-rail shoe-beams of the cars. *At right*—When the snow brushes fail to remove sleet from the third rail, hydro-carbon oil burners are used**

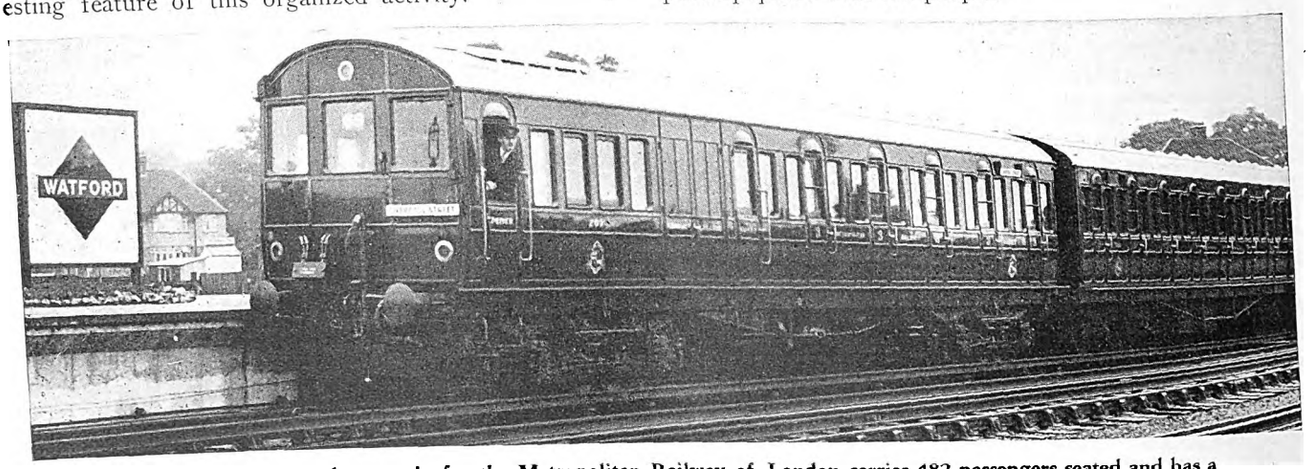
3 gal. each and are equipped with a long pipe nozzle with a suitable control valve. The burners are located at all the yards, terminals and barns. Because of the highly inflammable nature of the oil, the equipment is isolated from all buildings.

First Aid Graduates in Chicago Number 542

EMPLOYEES of the Chicago Rapid Transit Company, Chicago, Ill., and the three interurban electric railroads serving the Chicago metropolitan area, the North Shore Line, the South Shore Line and the Chicago, Aurora & Elgin Railroad, to the total of 542, completed the course in first-aid training during 1927 under the supervision of the medical department, according to figures given out recently by Dr. Hart E. Fisher, chief surgeon. Leading the list in number is the Chicago Rapid Transit Company, which during the past year graduated 202 men and 33 women employees from the first-aid course. The other employee-graduates are: North Shore Line, 104 men and 28 women; Chicago, Aurora & Elgin Railroad, 96 men and 24 women; South Shore Line, 47 men and 8 women. The increase in women graduates of the first-aid course is an interesting feature of this organized activity.

New Car for Metropolitan Railway, London

LONDON and Watford, a suburb, will be only a 30 minute run apart when the new subway cars operated by the Metropolitan Railway, London, England, are put into service. The company claims that this new train, recently exhibited, is the most powerful and expensive electric subway train in the United Kingdom. It has a maximum speed of 65 m.p.h., has motors developing 2,500 hp., has a tractive effort on starting of more than 30,000 lb. and a seven-car train can carry 482 passengers seated. One of the chief design features is that the whole control of its mechanism, heretofore placed under a motor coach, has been conveniently installed in a special compartment adjacent to the driver's cab. This will facilitate the handling of breakdowns particularly in tunnel sections where electrical fault location is very difficult, and will permit temporary failures to be instantly remedied. All of the company's rolling stock will probably be patterned by this standard because of the many improvements, including powerful braking, better lighting and more comfortable seats. The reason for holding the exhibition was for the purpose of allowing the public to inspect and criticize the new train. This new service is expected to prove popular with the people.



The new seven-car subway train for the Metropolitan Railway of London carries 482 passengers seated and has a starting effort of more than 30,000 lb.

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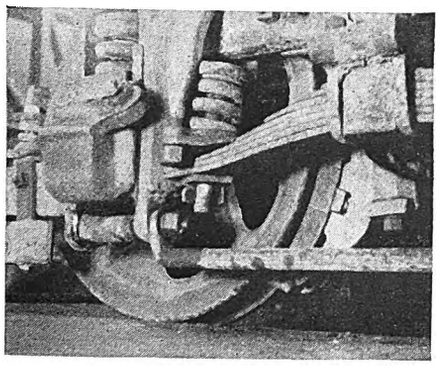
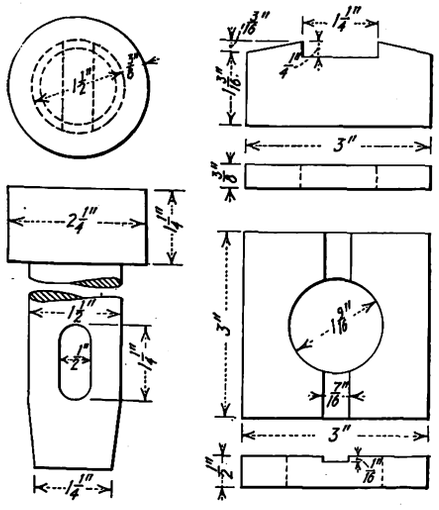
Maintenance Methods and Devices

Keyed Pin for Coil Spring Support

REMOVAL of a semi-elliptic spring from a truck was always difficult in the shop of the New York & Harlem Railroad, New York City, until a keyed taper pin was developed as shown in the cut. These springs originally were supported by a 1½-in. machine bolt. The threads of these



New keyed pin installed in truck



Details of pin, plate and key

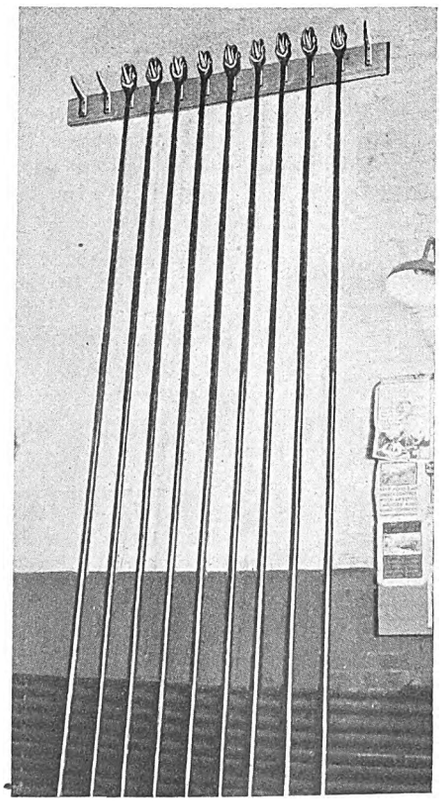
bolts became badly rusted between overhauling periods so that almost always it was found necessary to cut off the rust before the bolts could be removed. This not only wasted a great deal of time but usually resulted in the destruction of the bolt. The overhauling was retarded as a result and the material and labor expense increased considerably.

A keyed taper pin was designed and adopted to prevent this trouble. This pin is made of 1½-in. round stock and is tapered on one end to 1¼ in. A ½x1¼-in. slot is cut in this pin about 1 in. from the bottom of the tapered end for the reception of a key.

The head of the pin is formed by a ⅜x1¼-in. band welded to the top. When the pin is installed in position a ½x3x3-in. plate is slipped over the end of the pin and rests against the end of the semi-elliptic spring. A ⅜x3-in. key is then inserted in the pin slot. The top of this key fits into a 7/16-in. recess cut in the plate and the bottom, being recessed 8/16 in., drops downward in the pin slot, thereby locking it in a fixed position.

Trolley Pole Rack

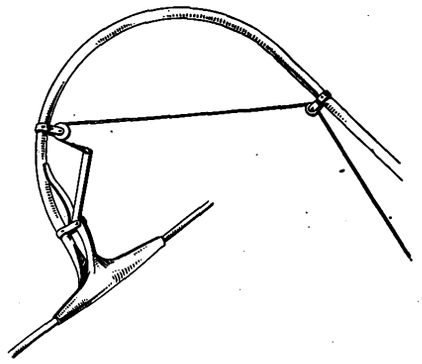
OVERHAULED trolley poles are suspended on a wall rack near the door of the overhauling shop of the Binghamton Railway, Binghamton, N. Y. The motormen, trouble men and shopmen have ready access to the rack and they know that poles ready for service will be found in this spot only. This plan has eliminated confusion and the possibility of installing a pole which has not been overhauled thoroughly. The weight of the pole is suspended on a hook made of ⅜x1-in. stock with a curvature conforming to the contour of the wheel. The twelve hooks are bolted to a 2-in. x 6-in. oak timber, lagscrewed to the brick wall. Sufficient poles are kept on the rack to meet the daily requirements.



Convenient trolley pole rack

Contact for Track Tools

CONNECTION to the trolley wire to supply electrical concrete mixers and other track machinery operated by the trolley current can be made by the ingenious device shown in the accompanying illustration. It was developed by the Paris Surface Lines and is in use on that system. Particulars of it are given in a paper read at the recent Marseilles convention of the French association by M. Gros, way engineer of the Paris company. Its purpose is to provide a method of connection that will not interfere with the use of the overhead line by passing trolley cars. In this particular it is superior to the ordinary hook "fishing pole" that has to be lifted off every time a car passes, delaying both the cars and the track work.



This trolley current collector for track machinery does not interfere with passing cars

The current collector consists of a bamboo pole, 19 ft. long, terminating in an aluminum gooseneck that carries a hinged clamp at its outer end. The two jaws of this clamp are about 10 in. long and each is semi-cylindrical, somewhat like the sides of a trolley ear, so that when closed they fit around the wire. Their ends are tapered to minimize the shock when the trolley wheel of a car passes beneath.

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The jaw of the clamp attached to the gooseneck is rigid. The other jaw is hinged and can be opened by a hemp cord long enough to reach to the foot of the bamboo pole. The clamp is normally held closed by a spring.

It was found that with the old hook connector on a fairly busy line, current could be obtained for the operation of the track machinery during only about 50 per cent of the time. With the present collector, the track machinery can obtain current for 100 per cent of the time, and passing cars are not delayed.

When your equipment is run down, refer your operating problems to maintenance physicians and surgeons.

Tie Bar Prevents Spreading of Pedestal Jaws*

By R. T. Chiles

Master Mechanic Cumberland County Power & Light Company, Portland, Me.

BREAKING of Brill 51-E-1 truck frames at the top of the pedestal next to the bolster has been overcome by the Cumberland County Power & Light Company, Portland, Me., through the installation of new pedestal tie bars. In the accompanying illustrations one shows the original arrangement and the other the improved type of tie bar. It was considered that the breakage was due to spreading of the pedestal jaws when brakes were applied. The new pedestal tie bar extends entirely across the pedestal jaws and is bolted to both ends of the front pedestal. The tie bar is made of $\frac{1}{2}$x2$\frac{1}{2}$x2$\frac{1}{2}$-in. angle. To apply it the lower end of the truck pedestals were evened up, old holes were filled in by electric arc welding and were then redrilled. This new arrangement has corrected the trouble.

**Submitted in* Electric Railway Journal *Prize Contest.*

Test Rack for Motor Coach Brakes

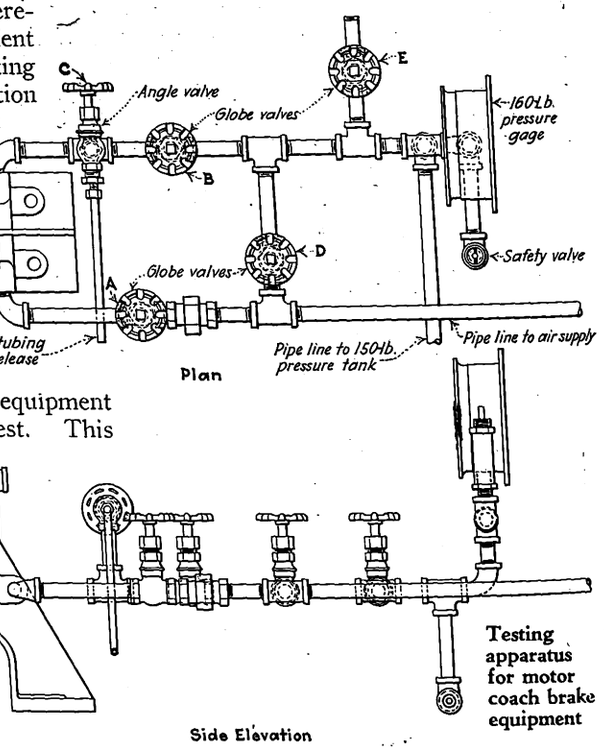
By Eugene M. Hettinger

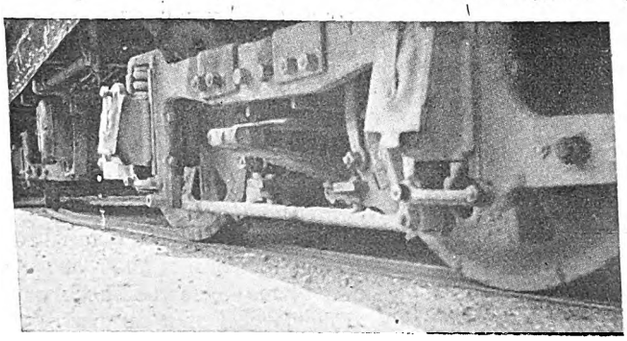
Garage Foreman Wisconsin Power & Light Company, Sheboygan, Wis.

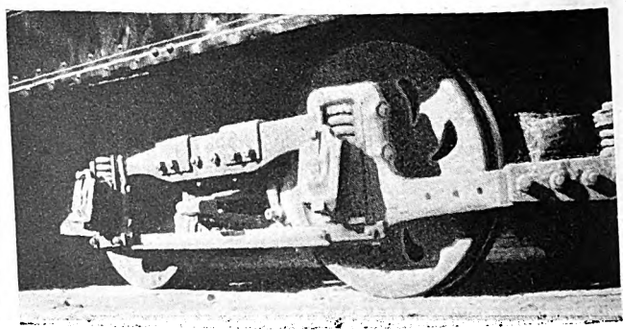
PROVISION for convenient testing of the four-wheel brake equipment of Yellow coaches was made by an assembly of pipes and valves in the garage of the Wisconsin Power & Light Company, Fond du Lac, Wis. This layout, illustrated herewith, gives a convenient means for testing regulating valves, gages, application valves and brake cylinders. Previously, to detect a failure in the motor coach air brake equipment, it was necessary to install the whole of the equipment to make a proper test. This entailed considerable work and often the equipment required removal and reinstallation several times in order to make final adjustments. The equipment as shown is bolted to a work bench and takes up a space of approximately 24x36 in.

To test a regulating valve, it is bolted to the bracket shown in the left of the diagram. By opening globe valves, *B* and *A*, air passes from the supply line through the regulating valve into the gage and then through the pipe line to the pressure tank. Air is supplied by a garage compressor pumping into a pressure tank of 10x20 in. of 150-lb. motor coach type. As the pressure rises, the cut out point for the regulating valve is indicated on the gage. Regulating valves are adjusted to cut out at 125 lb. pressure. In making this test the plug in the regulating valve bracket, which has a small opening through which the air escapes at 125 lb. pressure, is replaced with a street elbow turned to the rear of the testing apparatus. This diverts away from the operator any grease or dirt that might be blown through.

To adjust the cutting-in point of the regulating valve, globe valve *A* is closed. If it is desired to save air in the pressure tank, the valve *B* is also closed. Then by opening valve *C* the pressure escapes and the by-pass valve is set to cut in at not less than 85 lb. By closing valves *A*, *B* and *C* and opening valves *D* and *E*, necessary pressure is provided with which to test application valves and brake cylinders for leaks.







At left, truck with old type tie bar. At right, new tie bear arrangement

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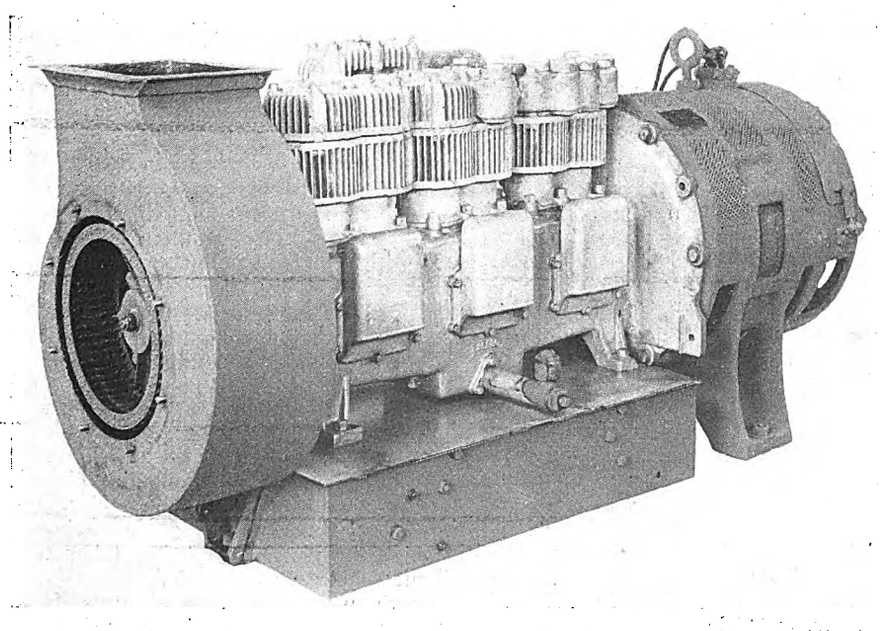
New Equipment Available

Pneuphonic, Not Pneumophonic

TWO extra letters crept into the name of the new Pneuphonic signal horn announced by the Westinghouse Air Brake Company, which was described in the April 7 issue of ELECTRIC RAILWAY JOURNAL. The proper designation for the horn is "Pneuphonic."

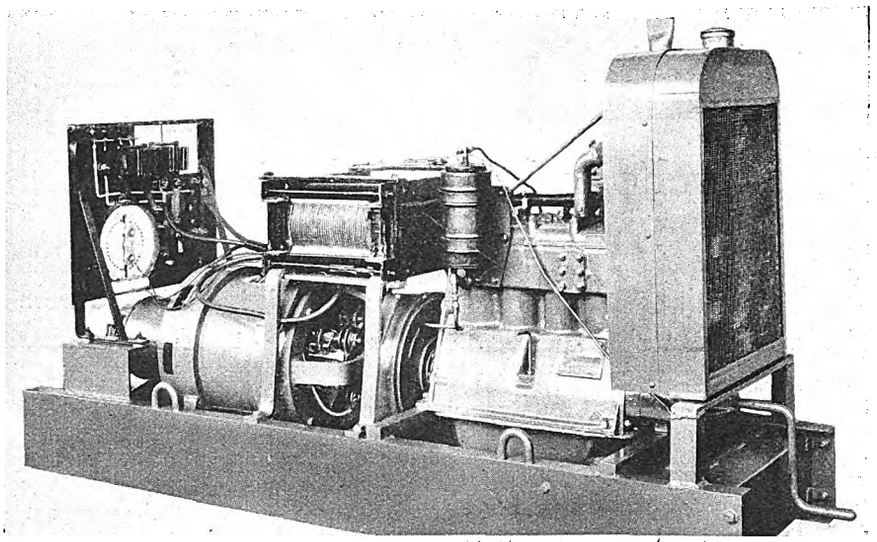
Motor-Driven Air Compressor for Electric Locomotives

HIGH speed features a motor-driven air compressor developed primarily for use on electric locomotives, announced by the Westinghouse Air Brake Company, Wilmerding, Pa. The compressor has a displacement of 150 cu.ft. per minute against 140 lb. air pressure and is driven directly by the motor at a speed of 1,500 r.p.m., the high speed being made practicable by a special type of mechanically controlled inlet valve. There are three stages of compression with a built-in intercooler for the first two stages. The cylinders are air cooled by a built-in blower attached directly to the crankshaft. The weight per cubic foot displacement and space required for installation are much less than that of low speed machines having a similar capacity.



High-speed motor-driven air compressor for electric locomotives

Gas Engine Driven Welder

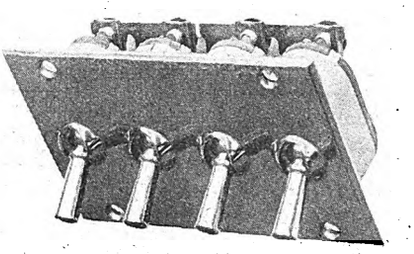


GROWING demand of welding various classes of construction work, where electric power is not readily available, has led the Lincoln Electric Company, Cleveland, Ohio, to bring out a new model of the Stable-Arc welder. The new unit has a rating of 200 amp., with a current range for welding duty, of from 50 to 300 amp. It operates at a speed of 1,500 r.p.m. The motive power is provided by a four-cylinder Continental Red Seal engine.

The welding generator and engine are mounted on a structural base welded into a solid piece of steel. This welded steel base provides a maximum stiffness and rigidity with a minimum weight. The complete unit weighs 1,580 lb. and is 76 in. long by 25 in. wide. The generator is also constructed of steel instead of cast iron. This reduces the weight and also the possibility of breakage in the field.

The complete magnetic circuit of the generator is of laminated steel, increasing the stability of the arc, which is highly desirable in welding work. A steel switchboard is also provided in place of the usual slate or composition board. This reduces the possibility of damaging the switchboard in the field.

Improved Light Switch for Buses



New toggle light switch for bus installation

SEVERE requirements of truck and bus service are met, it is claimed, by a toggle switch developed by the Cutler-Hammer Manufacturing Company, Milwaukee, Wis. This switch is for use where rough usage and constant vibration make the ordinary switch impractical. Through more rugged construction this switch eliminates the common fault of flickering of lights. The switch is obtainable in single-pole or three-way units and in any combination of these units. Three-point switches have two "on" and "off" positions, generally used for dimming. Busbars across the common terminals reduce the number of connections to a minimum.

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Association Activities

Psycho-technical Selection of Employees in Paris*

Tests for selecting motormen were begun in Paris in 1921, and were so satisfactory that they are now used for all wage earners on the Paris system

By Henri Verdollin
Assistant Engineer of Transportation of the S.T.C.R.P., Paris, France (Paris Surface Railway and Bus Lines)

NEED of care in the selection of its employees by the Paris surface railway and bus lines will be realized from the following statement: Of the total expenses of operating during 1927, 12 per cent went for material, 15.5 per cent for electrical energy and fuel, and 62 per cent for wages. Moreover, the material is used up in a short time, say within a year on the average, but every employee taken on by the company should represent an investment from the time he is engaged until he is retired, perhaps 25 years later.

In 1921, the engagement of employees for the S.T.C.R.P. was put on a scientific basis, under the direction of M. Lahy, manager of the experimental and psychological laboratory of the École Pratique des Hautes Etudes in Paris. To determine the practical value of psycho-technical examinations, 200 men—100 motormen and 100 bus drivers—whose service records were unknown to the manager of the laboratory, were subjected to the psycho-technical tests. Their ratings thus determined were compared with the records which these men had gained in actual service. The gradings as determined by test and as determined in practice corresponded 80 per cent. This caused the company to decide to install the system for all new employees and a laboratory was established in the Hainault Street depot of the company.

Tests for Motormen

An account of the tests for motormen in use in June, 1924, was given by Mr. Bacqueyrisse in a report before the International Street & Interurban Railway & Bus Association.† Mr. Bacqueyrisse stated in his association paper that his company was preparing the construction of a model car platform and bus platform in which the candidates for car or bus drivers were to be tested. These platforms have been completed. They are models of those in use on actual cars and buses but are mounted on springs so as to give their occupants during a test the same rocking motion as they would experience in actual service.

Now, when a motorman is to be examined, he takes his position on one of these platforms and faces a screen on which a moving picture is projected representing a street with all the customary incidents of a crowded thoroughfare. The motorman thus sees before him a picture of pedestrians crossing, automobiles cutting in front of the trolley car, etc. As these events happen, he is supposed to follow the same signals and visualize the same experiences as if the platform on which he is seated or standing was a car or bus in actual service. His reactions are then automatically recorded, as shown in the accompanying graph. Actual platform instruction does not begin until after an applicant has passed his psycho-technical test successfully.

The effectiveness of the psycho-technical tests in weeding out men unfitted for the work is shown by the statement that whereas, in 1923, the number of apprentices dropped, after otherwise being accepted, was 17.2 per cent, this figure has since fallen to less than 4 per cent. As the company pays applicants during the apprentice period, it makes a monetary gain in days not paid to persons who are eliminated by the laboratory before they start as apprentices. This reduction in cost represented an annual saving in 1926 of 200,000 fr. ($8,000).

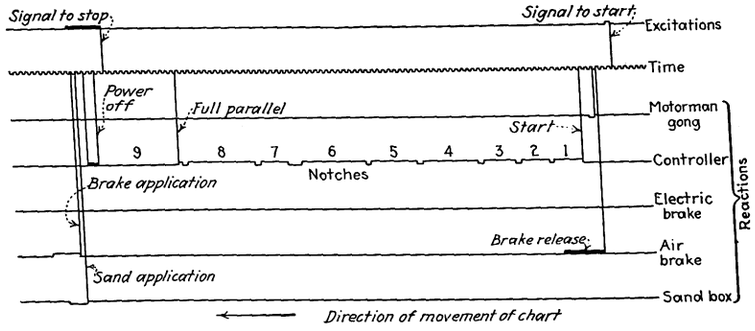
As regards accidents, there has also been a notable reduction. Comparison made of the work of 200 motormen of whom 100 were selected and 100 not selected by the psychological tests shows in favor of the former a reduction of 16.5 per cent in accidents, representing an annual saving of about 1,500,000 fr. ($60,000). These results are shown in an accompanying graph. Incidentally, it might be said that while the accidents of the company show a reduction, the figures compiled by the Paris police indicate that street accidents caused by automobiles and other vehicles on the street have had a constant increase.

Conductors and Shopmen

Statistics of the Paris company show that prior to 1926, of every 100 applicants for the position of conductor accepted by the employment agents, only 34 were in service by the end of one year. Of the other 66, 10 never reported to the training school after passing the medical examination, 12 were dropped during the period of instruction, 3 at the time of the examination, 5 during the first month of service and 36 during the following eleven months for various causes. This indicated to us that a psycho-technical examination which had done so much in weeding-out unfit candidates for the position of motorman would be equally valuable if adapted to applicants for the position of conductor. A system of such tests was then drafted. Some of these were the same as those for motormen, such as rapidity and regularity of physical reaction, fatigue resistance and memory for words. In addition, certain special intelligence tests were added, both written and practical.

The latter included a test of giving to the candidate a number of wooden plates perforated with holes of different shapes and a number of wooden plugs of different shapes. If properly selected, these plugs would exactly fit the various holes in the plates. The time taken to fill these holes was recorded.

There were also several tests for memory. In one, the subject was shown a picture containing a certain number of



Typical record made by prospective motorman

*Abstract of paper presented at the convention of the Union Des Voies Ferrées et des Transports Automobiles (Railway and Bus Association of France) held in Marseilles, Nov. 6-8, 1927.

†See Electric Railway Journal for Aug. 23, 1924, page 280. For later developments see issue for Aug. 27, 1927, page 352.

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ordinary objects. After the picture was removed, he was expected to give from memory the names of as many of the objects shown as he could. Later, he was shown successively pictures of a large number of objects, including some of those which were in the group first shown to him. He was tested on the number which he could remember in the first group.

His ability to recollect faces was tested by a series of portraits showing the head and shoulders of individuals supposed to represent passengers. He was then told which of these portraits were assumed to be of passengers who had paid their fares. Then, when the portraits were shown to him again, he was expected to tell which were in the group assumed to have paid and which were in the group which had not paid. Another test was to throw on a screen for short times pictures representing car and bus platforms, each containing a different number of passengers. The candidate was expected to estimate rapidly the number of passengers on each platform so exhibited on the screen.

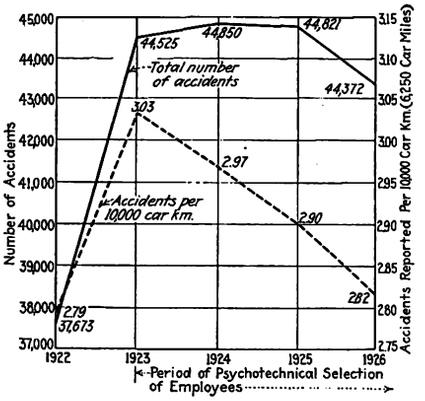
The ability of the candidate for concentrated attention was tested by means of a printed sheet, on which he was asked to cross off within a fixed time all marks having a definite form. The quickness of his reaction to sensory stimuli was tested by a vertical box containing various numbered slots inclined differently. Into these slots he was asked to slip correspondingly numbered small disks, a record being made of his errors and omissions. His ability to tell the denomination of coins by sense of touch was tested by a number of disks or chips of different sizes which were placed in the standard closed bag carried for change by Paris conductors. The candidate, after he had been blindfolded, was required to take these various sized disks out of the bag in a predetermined manner.

Of the tests mentioned for conductors, not all are being used at present. Those now employed are the regularity and rapidity of physical reaction test and the fatigue resistance test, which are individual tests, and the memory tests, the written intelligence test and the test for estimating the number of passengers on a platform, which are collective tests. The accompanying table shows the correspondence of records made in service of the first 50 conductors examined by these methods.

ANALYSIS OF 50 CANDIDATES FOR POSITION OF CONDUCTOR TESTED IN PARIS LABORATORY AND THEIR RECORDS OF SERVICE

Classification and Number in Service Record		Record in Test		Per Cent of Group	
		Good	Poor	Good	Poor
Good	24	22	2	91.7	8.3
Fair	15	9	6	60.0	40.0
Mediocre	4	0	4	0	100.0
Poor	7	1	6	14.3	85.7

As this method of examination has been in use only six months, it is not possible to give as definite figures as with the motormen, but it is believed that good results will be obtained.



Accident records in Paris show a reduction since the psycho-technical method of testing applicants for employment as motormen was adopted

The first psychological tests for shop men were made in 1926. They included tests for rapidity and regularity of physical reaction, fatigue resistance, concentration, memory, and intelligence, both written and practical, as already described. In addition several other tests were designed. Of these the principal were several tests to determine the manual dexterity of the candidate. They included the fitting of nuts to bolts, the threading of needles, the co-ordination of the movements of both hands on equipment designed for this test, the insertion by a blindfolded candidate of wooden plugs in the holes of a wooden plate, the sorting of beads of different colors, etc. In each of these tests, a record is made of the time taken by the candidate to fulfill the task.

Other tests devised were to gage the candidate's sense of proportion, his understanding of geometrical figures by asking him to complete figures partially drawn, his steadiness of hand, etc. In general, the standing obtained by candidates in these tests and that shown in their subsequent behavior as shop apprentices were quite close.

Conclusions

At the present time all applicants for employment on the S.T.C.R.P. who have passed the medical test and are otherwise acceptable, are tested at the psychotechnical laboratory. Here, all receive the written intelligence test which, after all, is considered the most important.

As a result of these tests the company is often able to reassign those accepted for employment, sending to one department a man who had originally applied for another, because the applicant himself often does not know the work for which he is best suited. As the weeding out process takes place at the beginning of employment, the company is able to devote its attention to teaching the new men the duties of the particular jobs to which they have been assigned with a fair assurance that they will be able to perform their tasks satisfactorily in the future.

L'Industrie des Voies Ferreés et des Transports Automobiles, whose January, 1928, issue contains the full paper, publishes also data of the tests of other railway companies in Europe.

COMING MEETINGS OF *Electric Railway and Allied Associations*

May 6-12—Union Internationale de Tramways, de Chemins de fer d'Interet Local et de Transports Publics Automobiles, Rome, Italy.

May 7-10—National Conference on City Planning, Dallas and Fort Worth, Texas.

May 8-11—United States Chamber of Commerce, Washington, D. C.

May 9—A.E.R.A. Executive Committee, Washington, D. C., 3 p.m.

May 9-10—Central Electric Railway Master Mechanics' Association, Lawrence Hotel, Erie, Pa.

May 9-12—American Institute of Electrical Engineers, regional meeting, Northeastern District, Hotel Taft, New Haven, Conn.

May 16-17—Central Electric Traffic Association, Tuller Hotel, Detroit, Mich.

May 24—New England Street Railway Club, annual meeting, Boston, Mass.

May 28-31—National Association Purchasing Agents, annual convention and exhibit, American Royal Building, Kansas City, Mo.

June 4-6—Midwest Electric Railway Association, Hotel Baltimore, Kansas City, Mo.

June 4-8—National Electric Light Association, Atlantic City, N. J.

June 6-8—Canadian Electric Railway Association, annual convention and exhibit, Toronto, Canada.

June 14-15—New York Electric Railway Association, Half Moon Hotel, Coney Island, N. Y.

June 20-27—American Railway Association, Div. 5—Mechanical, annual convention and exhibit, Atlantic City, N. J.

June 21-22—American Railway Association, Motor Transport Division, Atlantic City, N. J.

June 21-22—Wisconsin Utilities Association, Accounting Section, Hotel Pfister, Milwaukee, Wis.

June 28-29—Central Electric Railway Association, Cedar Point, Ohio.

July 8-12—Public Utilities Advertising Association and International Advertising Exposition, Detroit, Mich.

July 25-27—Electric Railway Association of Equipment Men, Southern Properties, Cincinnati, Ohio.

July 27-28—Central Electric Railway Accountants' Association, Detroit, Mich.

Aug. 16-17—Wisconsin Utilities Association, Transportation Section, Sheboygan, Wis.

SEPT. 22-28, 1928

American Electric Railway Association, 47th annual convention and exhibit, Cleveland, Ohio.

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C.E.R.A. Issues Year Book

MANY facts regarding the Central Electric Railway Association and the affiliated Central Traffic, Accountant and Master Mechanics' Associations are contained in the Year Book of the association just issued. The Year Book gives a revised list of member companies with their mileage, the membership of all principal committees, the annual report of the secretary, and the various amendments to the constitution which have been adopted from time to time. The principal rules of the Central Electric Traffic Association are also included.

Canadian Convention Program Announced

PLANS are virtually completed for the 24th annual convention of the Canadian Electric Railway Association, which will be held in Toronto on June 6-8 next. It is expected that there will be the largest exhibition of electric railway supplies and materials in the history of the association. Provision has been made for 23,000 sq.ft. of floor space.

Following is the program of the principal events scheduled:

WEDNESDAY, JUNE 6, 1928

Royal Coliseum, Canadian National Exhibition Grounds

9 a.m. Registration.

10 a.m. Minutes of 1927 annual meeting, president's address, treasurer's report, secretary's report.

11 a.m. Reports of committees:

(a) Rail corrugation.

(b) Motor bus and truck committee. Discussion led by J. L. Smith, superintendent motor coach department Toronto Transportation Commission.

(c) Publicity and merchandising of transportation.

(d) Safety and accident prevention.

12:30 p.m. Discussion of timely topics: "Snow Removal Practice." Discussion led by William C. Smith, superintendent of training school Montreal Tramways, and J. M. Ahearn, assistant manager and purchasing agent Ottawa Electric Railway.

1 p.m. Luncheon—Royal Coliseum.

Official welcome to Toronto by P. W. Ellis, chairman Toronto Transportation Commission.

Address—Lucius S. Storrs, managing director American Electric Railway Association.

2:30 to 5 p.m. Inspection of exhibits.

9 p.m. Supper Dance—"Crystal Ball Room," King Edward Hotel.

THURSDAY, JUNE 7, 1928

Royal Coliseum

9 a.m. Paper—"The Importance of Public Transportation in Traffic Control Regulations," by E. J. McIlraith, staff engineer Chicago Surface Lines.

11:30 a.m. Discussion of timely topics: "Mercury Arc Rectifiers and Their Advantages." Discussion led by M. L. de Angelis, assistant electrical engineer Montreal Tramways, and R. A. Brown, general manager and chief engineer Calgary Municipal Railway.

"Electric Track Switches, Their Place and Maintenance." Discussion led by L. H. McAdam, electrical department Toronto Transportation Commission, and Elmer S. Olmsted, vice-president and electrical engineer Cheatham Electric Switching Device Company.

1 p.m. Luncheon—Royal Coliseum.

2:30 to 5 p.m. Inspection of exhibits.

7:30 p.m. Cabaret Dinner, "Pompeian Room," followed by Dance in the "Crystal Ball Room," King Edward Hotel.

FRIDAY, JUNE 8, 1928

Royal Coliseum

9 a.m. C.E.R.A. Meeting Hall, Royal Coliseum.

Paper—"General Overhead Line Practice," by M. C. O'Donnell, electrical engineer Ottawa Electric Railway. Discussion led by J. F. Neild, electrical engineer Toronto Transportation Commission.

11:45 a.m. Discussion of timely topics: "Treadle Cars—Should All Passengers Leave by Rear Door?" Discussion led by J. Metcalf, assistant traffic superintendent Toronto Transportation Commission, and A. Frank Paul, assistant to general sales manager National Pneumatic Company.

"Improving Revenue by Publicity." Discussion led by George E. Waller, manager of railways Dominion Power & Transmission Company, Ltd., Hamilton, Ont., and J. Lightbody, publicity agent British Columbia Electric Railway, Ltd., Vancouver, B. C.

12:30 p.m. Election of officers and general business.

1 p.m. Luncheon—Royal Coliseum.

2:30 to 5 p.m. Inspection of exhibits.

American Welding Society Holds Spring Meeting

ESTABLISHING preliminary standards for qualifying welders and supervising their work, advancement of test programs for welding parts and structures, and the perfecting of technique featured the reports and discussions of the annual spring meeting of the American Welding Society held at the Engineering Societies Building, New York City, on April 25, 26 and 27.

At a meeting of the pressure vessel committee, it was pointed out that the support of tank manufacturers and manufacturers of electric welding equipment is needed to insure an early start on the extensive test program to be carried out jointly by the American Welding Society and the American Society of Mechanical Engineers. The tests are intended to supply data sought by the A.S.M.E. boiler code committee as a basis for proposed modifications in the code for unfired pressure vessels.

A preliminary progress report on qualifications of welders, inspection and supervision was presented by H. H. Moss and A. M. Candy. This covered the fields of structural steel and industrial piping, and was followed by prepared discussions covering structural steel, piping and pressure vessels. Merrill Turner of the Electric Rail Weld Service Corporation, Chicago, Ill., presented a paper on the building up of battered rail ends. No new data to the practice universally used by electric railways was presented.

The following officers were elected for the ensuing year: President, F. T. Llewellyn; senior vice-president, A. E. Gaynor; divisional vice-presidents, Ernest Lunn, J. W. Meadowcroft, H. P. Peabody; directors-at-large, A. M. Candy, J. H. Deppler, E. H. Ewertz, S. W. Miller. Social affairs of the meeting included a luncheon and a stag dinner.

A.E.S.C. Changes Procedure

REVISION of its rules of procedure to speed industrial standardization work on a national basis is announced by the American Engineering Standards Committee. The chief object has been to make it more flexible so that it may fit the varied conditions to be met in the wide range of industrial subjects covered by the committee's work.

Three changes are made in the procedure. Heretofore each sectional committee has acted under the administrative support and direction of one or more of the interested bodies, who are termed sponsors. A sectional committee may now operate autonomously, reporting directly to the A.E.S.C., or it may act under sponsors as before. The second change recognizes "proprietary" standards and makes possible the revision of such standards within a single organization on condition that it be shown that a standard is acceptable to the groups concerned. This method is particularly applicable to highly specialized fields in which the standard of an organization has already achieved a position of recognized eminence. The third change provides for very simple cases. The approval of standards under such cases is based upon the action of a conference followed by written acceptances of the interested groups.

Missouri Utility Association Annual Meeting

MODIFICATION of school curriculums to permit the study of public utilities was advocated by Governor Sam A. Baker of Missouri in his opening address delivered before the Missouri Association of Public Utilities at the 22d annual convention held in Jefferson City, Mo., April 26-28. Motor bus competition was discussed by Edwin S. Austin, supervisor of the motor bus division of the Missouri Public Service Commission, and application of power and light ideas to ride salesmanship was discussed by Walter Jackson, fare consultant, Mount Vernon, N. Y. Thomas J. Brown, chairman of the Missouri Public Service Commission, spoke on state regulation and the workings of the state commission in an address delivered at the annual banquet on April 27.

The following officers were elected for the coming year:

A. E. Reynolds, vice-president and general manager Springfield Traction Company, president; F. D. Beardslee, St. Louis, Mo., secretary and treasurer; T. J. Stricker, Kansas City Gas Company, first vice-president; E. D. V. Dickey, Citizens Gas Company, Hannibal, second vice-president; and Samuel W. Greenland, St. Louis Public Service Company third vice-president.

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News of the Industry

Guaranteed Return on Shaker Heights Line in Cleveland

A cost plus 10 per cent contract under which the Cleveland Railway, Cleveland, Ohio, will operate the Van Sweringens' Shaker Heights rapid transit lines was recently approved by the City Council. Although the rapid transit is operated for the most part on a private right-of-way, the downtown end of the line connects with city railway lines. The new contract is effective as of Jan. 1. It will expire on Jan. 1, 1930, by which time it is expected the Shaker rapid transit line, along with other rapid transit lines projected by the Van Sweringens, will be operating over a private right-of-way the entire length of the route into the Van Sweringens' new union terminal.

Heretofore the Cleveland Railway has been collecting a city fare for every passenger carried in rapid transit cars over city tracks. As a result the rapid transit cars for several years have been leading the Cleveland Railway system in earnings per car-mile. This was an expensive arrangement for the Van Sweringens, because it left something less than 4 cents out of each 10-cent fare to pay the cost of operating the two divisions of the Shaker line along a 7-mile private right-of-way. Under the old arrangement, there was always a deficit to be made up by the Cleveland Interurban Railway, which owns the rapid transit lines, but this was not unexpected, since the rapid transit was built for the purpose of increasing the sales of Shaker Heights property owned by the Van Sweringens. The population of Shaker Heights has increased to such an extent, however, and the line is so popular that it is expected to pay its own way under the new contract which has been negotiated.

The Cleveland Railway is expected to cite the cost plus 10 per cent agreement in its efforts to secure from the suburban communities which it serves fares sufficient to meet the cost of operation to those communities.

Transfer Privilege Broadened in St. Louis

The St. Louis Public Service Company, St. Louis, Mo., has agreed tentatively to permit passengers to transfer from street cars to all of its buses for a single fare of 7½ cents. At present 10 cents is charged on the buses, which transfer to street cars, while to obtain a transfer from a street car to a bus of the railway one must pay the conductor 3 cents above the regular car fare.

Fulfillment of the company's promise, however, is dependent upon the board's granting it permission to operate a new bus line on Meramec Avenue from Grand Boulevard to Carondelet Park. About 150 residents of the vicinity were present who appeared to be unanimously in favor of the new line. President Kinsey said the People's Motorbus Company, which is opposing the granting of the permit, has asked to be heard. The bus company, which operates over this route, will be given an opportunity to present its arguments in the case before the board passes on the application.

Economies Through Consolidation of Illinois Traction Subsidiaries

The Illinois Terminal Company has received permission from the Interstate Commerce Commission to lease and operate as a single unit the railroad properties of the St. Louis, Troy & Eastern Railroad, the St. Louis & Illinois Belt Railway, the St. Louis Electric Terminal Railway and the main division of the Illinois Traction System. It is believed, this consolidation will bring about more economic and efficient operation.

Seven-Cent Plea of I. R. T. Approved

Decision finds federal courts have jurisdiction and that company is entitled to 2-cent increase, pending master's investigation of exact amount needed. Supreme Court to hear plea

A DECISION in the Interborough Rapid Transit fare case in New York was handed down on May 2 in the Federal Statutory Court, made up of one circuit and two district judges in the Southern District of New York. The original bill was a plea for injunction restraining the three transit commissioners and the chairman of the Department of Public Service of the State of New York from enforcing various rate limitations on the Interborough Rapid Transit Company and its lessee, the Manhattan Railway, for the transportation of passengers in New York City. The case has been before the court since Feb. 14. The decision favored the contention of the company.

Fare Provision Subject to Regulatory Action

After pointing out why public service corporations subject to confiscatory limitations in their rates can appeal to the federal courts, the decision summarizes the history of rapid transit legislation in New York State as well as that relating to the appointment of public service commissions. The New York public service commission law giving authority over rates, it points out, was passed in 1907, while the final contract (No. 3) of the city with the Interborough Rapid Transit Company was not entered into until 1913. Its fare provision of "5 cents and no more" was therefore subject to regulatory revision by the commission in the manner prescribed in the public service commission law.

Numerous cases were cited on this point, particularly People vs. Nixon, 229 N. Y., 356, from which quotations were made. It was thus the duty of the Public Service Commission "to make the fare sufficient to yield reasonable compensation for the services rendered and no more." In the rapid transit act of 1912 there is no evidence that the Legislature intended to burden the city with an exorbitant fare or the company with a non-compensatory rate. In fact, Section 8 of this act provides that all terms and conditions as to rates of fare and service shall be subject to supervision by the commission.

The court also held that where a state legislature intends to transfer its power over rates to a municipality or regulatory body, the intention must be clear and unmistakable. The renunciation of a sovereign right to control rates, it says, must be unequivocal, as shown in Milwaukee Electric Railway & Light Company vs. Railroad Commission of Wisconsin (238 U.S. 174, 180). This was not the case in New York.

The court differentiated the case from some earlier ones where it was held that equity cannot relieve a company from a bad bargain. In the Columbus rate case, 249 U.S. 399, the Legislature of Ohio had not established a regulatory commission by which franchise and contract rates might be regulated upward and downward. In the Atlanta-Decatur fare case, 262 U.S. 432, the state had not exercised its police powers over the subject of rates and was not seeking to. Other cases mentioned as differing in principle from the one under consideration were Southern Utilities Company vs. Palatka, 268 U.S., 232; Henderson Water Company vs. Corporation Commission, 269 U.S. 278, City of Cleveland vs. Cleveland Railway, 194 U.S. 517, and Tampa Water Works vs. Tampa, 199 U.S. 241.

The decision had already pointed out that no provision of the law compelled a lower rate on the leased Manhattan Railway.

On the basis of the company's com-

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puted valuation of its property and the commission's figure of the value of the city-owned property used on the I.R.T. system, the rate of return in 1926 was 2.65 per cent and in 1927 was 2.52 per cent. If the return on the value as computed had been 8 per cent, (as in McCardle vs. Indianapolis Company, 272 U.S. 419; Bluefield vs. Galveston, 262 U.S. 692, etc.), the court declares that $49,280,731 would be required to make up the difference in 1925.

On the propriety of including the city-owned property to determine the necessary return, the court took the ground that the property for which the Constitution requires consideration is "that devoted to the public use." Many cases are cited where leased property was included. The court concludes this portion of its decision with the words:

> The city's property is earning the return as well as the plaintiff's and the plaintiff's leased railway. All must be considered in calculating the capital making the return and rendering the service.

BONDS TO BE FILED

The court held that it would grant an injunction allowing the company to charge a 7-cent fare until the report of a master to be appointed to take more evidence on the value of the property and the exact fare necessary to prevent confiscation. In the meantime, the company would be required to issue rebates to passengers and file a bond to repay them in excess of 5 cents collected per passenger to the extent that the court should later direct. If the city preferred, however, the court said it would grant a stay in this order if the city would file a bond to indemnify the company from further daily confiscation of its property.

PLEA FOR STAY TO BE HEARD MAY 14

Notice was served on the Interborough Rapid Transit Company on May 3 by Associate Justice Stone of the United States Supreme Court that he will at once entertain "an application for a temporary stay," if it attempts to collect a 7-cent fare on its subway and elevated lines in New York, in accordance with the authority granted by the Federal Statutory Court before the Supreme Court has had an opportunity to pass on a motion for a stay to be made in behalf of the city.

In his communication to counsel for the railway Justice Stone stated that he had been informed an application would be made to the Supreme Court in behalf of New York City for a stay, pending formal appeal to the Supreme Court. He said further that consideration of the request for a stay would be entertained by the full bench of the Supreme Court in open session on May 14.

The Mayor said that "every resource of the city, legal and financial, will be employed to retain the nickel fare." At the same time, he announced that he would be a candidate for re-election and would run on a 5-cent fare platform.

Former Mayor Hylan gave out an interview intimating that if he had been retained in office, he would have kept the 5-cent fare in force. He said he was a candidate for Mayor at the fall election.

William H. Ransom, special counsel to the Interborough points out that to earn an 8 per cent return on both the city's and company's investment in rapid transit, a 9-cent fare would probably be necessary.

In its original application to the Transit Commission the Interborough asked for permission to change its rate from "5 cents per passenger to 7 cents . . . without prejudice to its right to adjust such fares upward or downward as conditions and costs of operation may require under actual experience with such rates."

Unified Bus and Railway Service in Effect in Indianapolis

An important step in unification of the Indianapolis Street Railway and the Peoples Motor Coach Company both of Indianapolis, took place recently when transfers between buses and street cars were interchanged. Some feeder buses in the city were discontinued and through service to the business district was started. Simultaneously a new bus fare for school students became available. A strip ticket of ten fares is placed on sale each week, the average trip price being 6¼ cents. Transfers are free from bus to bus and from bus to car and the payment of 4 cents in cash, or a token having a value of 3¾ cents, known as an equalizing fare, entitles the passenger on a car to transfer to a bus.

Union Contract in St. Louis Cancelled

The St. Louis Public Service Company, St. Louis, Mo., served written notice May 3 on the Amalgamated Association that the existing contract with the union would be terminated June 2. This move followed action taken at the regular meeting of the board of directors on May 1 when a resolution was unanimously adopted to cancel the contract. The management had previously suggested a cut in wages of the 4,800 members of the union amounting to about 9 per cent. This action was in the nature of a counter proposal to the demands made on the management on March 5 for an increase in wages for motormen and conductors of 5 cents an hour and improved working conditions. These demands were rejected by the management on the ground that they would increase the company's annual payroll, if applied to all employees, $4,000,000.

Wage negotiations have not yet been broken off with the union, whose committee expects to have further conferences on the controversy. Stanley Clarke, executive vice-president of the company, reported to the directors that the union had rejected the company's demand for a wage cut, and asked for authority to terminate the contract, whereupon the directors unanimously adopted the resolution.

New Agitation Over Piedmont & Northern Connection

Business men of York, Union, Laurens, and other places along the way are uniting in a movement to induce the Piedmont & Northern Railroad to build its connecting line between North and South Carolina from Belmont, N. C., to Honea Path, S. C. This movement was started as soon as the Interstate Commerce Commission denied the application to make the connection between Gastonia, N. C., and Spartanburg, S. C. The proposed line from Belmont to Honea Path would not parallel any existing railway and would traverse a rich agricultural region. For a number of miles in York County south of Belmont the road would traverse land owned by the Duke interests, purchased in connection with the building of dams across the Catawba.

Many of the towns along the proposed route are manufacturing centers.

Extension of Franchise in Chicago

Another 30-day extension of the franchises of the Chicago Surface Lines has been approved by the City Council. The new permit became effective May 1 and allows the companies to continue operations from day to day until June 1. That a special session of the Illinois General Assembly will be called this month to consider Chicago traction legislation was again seen as a possibility by members of the City Council in a statement made recently by Governor Small. In spite of his defeat at the primaries on April 10, the Governor said that he felt that his promise to call a special session is as binding upon him as it would have been had he been renominated. Several of the Aldermen expressed the opinion that the city is no nearer an agreement with the transportation companies regarding a legislative program than it was a year ago and that in the light of this situation it would be futile to call a legislative session.

Invitation to Pass Ideas Along in Cincinnati

For the best suggestion on how a conductor can sell more rides for the company, a $10 prize is offered by the Cincinnati Street Railway, Cincinnati, Ohio. Prizes of $5 each are being offered for the three next best. Suggestions, solicited by the editor of The *News*, the official paper of the company, were required to be in the editor's hands by April 21.

One-Man Cars on Kansas Line

One-man cars are now being operated by the Kansas City Public Service Company on the Holmes-Quindaro line in Kansas City, Kan. They operate on three and eight-minute schedules and thus increase the volume of service to patrons. From 9 o'clock to 2 o'clock on the first day the new service was installed, passengers were allowed to ride free.

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Color Suggestions Total 3,451 in Jacksonville

The people of Jacksonville and Duval County have been thanked and congratulated in a recent newspaper advertisement by the Jacksonville Traction Company, Jacksonville, Fla., for the 3,451 valuable suggestions for colors for the company's cars. The company offered a first prize of $25, two second prizes of $15 each, three third prizes of $10, and 100 fourth prizes of $1 each for the best color suggestion for repainting its cars. The sketches submitted were judged according to their practical color value, artistic value and neatness. Many of the winning exhibits were on display in a window of Cohen Brothers big store. The names of the winners were published in newspaper advertisements.

Commission to Pass On One-Man Cars for Hartford

The Connecticut Company, Hartford, Conn., has taken its plea to be allowed to operate one-man cars in Hartford before the Public Utilities Commission. The original Tucker grant, over which there has been much controversy, required that the railway operate all trolleys with two-man crews. The city of Hartford has allowed about 22 per cent one-man operation and it is the plan of the Connecticut Company to increase this to 90 per cent.

A recent hearing was held at which Connecticut Company officials presented one-man car statistics to the commission. The city was not represented at the meeting. President J. K. Punderford stated that if permission were granted the company planned to rebuild its present cars as one-man models. It was brought out that revenues of the company had dropped $250,000 in one year. Figures were presented to show the steadily increased operation of one-man cars in other cities. Accidents, it was maintained, were no higher with one-man than with two-man cars. One-man cars are also more economical.

Rehearing on Los Angeles Railway Fares Denied

Finding no merit in the contention of the Los Angeles Railway, Los Angeles, Cal., that the commission had erred in denying its application for a fare increase from 5 cents to 7 cents, the Railroad Commission has denied the petition of that company for a rehearing. In its order denying the rehearing the commission emphasized that the rate base of $42,000,000 fixed for that utility in the commission's order was extremely liberal, and that the commission had carefully considered all of the evidence and claims of value which were before it in the rate hearing. In passing on this point the commission said in part:

It is significant that, on this record, a fair allowance for reproduction cost new, less depreciation, would, with fair allowance for all intangible items, amount to a sum considerably less than the figure which we have found as a rate base. The testimony as to these items discloses wide variation in the several estimates, and in our opinion, not more than $36,350,000 could fairly be said to represent the basic figure of reproduction cost new, less depreciation.

"New Business" Contest in East St. Louis

A "new business" contest in East St. Louis, Ill., has been under way since April 1 among the employees of the East St. Louis Railway and affiliated companies. The contest offers cash prizes of $100, $50 and $25 and three bonuses. According to the contest rules, employees are appointed as agents of the companies in the solicitation of chartered trips on the Blue Goose Motor Coach lines and on the street car. Traffic tip cards giving information of possible sources of new business have been distributed in connection with the contest. These cards are to be filled out by the employee and sent to the traffic solicitor, who, in turn, will follow up the tip and endeavor to secure the business. The cash commissions are paid to those employees securing business over a stipulated amount and, in addition, the total amount of business secured is placed to their credit toward the three bonuses to be awarded at the end of the contest.

$20,000,000 for Initial Reading Electrification

ELECTRIFICATION for the Reading Railroad out of Philadelphia, Pa., was foreshadowed in the purchase on April 30 by that company of a 12-acre tract at Nineteenth and Rockland Streets, Philadelphia, Pa., for the erection of an electric train storage yard. Agnew T. Dice, president, said that electrification of the line would embrace one of the most important sectors of the road, namely, from the Reading Terminal to Wayne Junction. Other improvements were predicated upon the completion of this work, and when the Chestnut Hill branch was in operation the company anticipated making extensions of electric service to Lansdale on the Bethlehem branch and from Glenside to Willow Grove. The next step would be a continuation to the New York branch, with the first projection of service being from Jenkintown to Langhorne.

The electrification program will be carried out at a cost of $20,000,000. It provides for the transformation of lines from the Reading Terminal, Philadelphia, to Chestnut Hill as the first step. Seven grade crossings in the Germantown section will be removed and seven bridges will be rebuilt under existing plans. Also a large terminal yard will be constructed at Chestnut Hill.

Improvements for Columbus Approved

The proposal of the Columbus Railway, Power & Light Company, Columbus, Ohio, to make all streets with car tracks main thoroughfares and to speed up service from 20 to 25 m.p.h., has been approved by the Columbus Traffic Commission in answer to the request of the City Council for a recommendation. Establishment of the skip-stop system was also approved. Objection to the clause making all track streets main thoroughfares, regardless of the amount of traffic on them, has been expressed by the Columbus Automobile Club, Mayor Thomas and police officials, as well as several Councilmen. A survey of the situation is to be conducted before the Council acts.

Franchise Plans in Kansas City Advanced

Formal approval was given the proposed new bus franchise plans by the board of directors of the Kansas City Public Service Company on April 26. The company will ask a new franchise of the city.

Powell C. Groner, president of the company, announced it was planned to have the ordinance ready for the next meeting of the City Council. A 15-cent fare for the downtown buses, and new routings were covered in suggestions filed with the city clerk.

The new bus ordinance will retain the Warwick bus line on Grand Avenue and will send the Armour-Paseo bus line down Baltimore Avenue. It had been announced previously that these bus lines would go into the downtown district on other streets. Officials of the company in submitting the ordinance to the City Council will suggest that the shift in bus routes be made May 31.

Nahant-Lynn Fare Increase Stands

The Public Utilities Commission has allowed the fare increase of the Nahant & Lynn Street Railway of Massachusetts and dismissed the petition of the Selectment of Nahant asking for the increase to be set aside. The fare increase goes into effect at once and provides for a 2-cent increase from 13 to 15 cents between Nahant and Lynn and also a slight increase in the price of strip tickets.

In its opinion the commission stated that for the year 1927 the operating revenue of the company did not meet the actual operating expenses by approximately $11,000 and that in 1925 and 1926 the difference was even greater. In spite of the several suggestions made the commission felt it ought not to set up judgment against the management of the company, faced as it was with an annual deficit. It was obvious that the management should take such steps as were possible to maintain its patronage and increase revenues.

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Special Services on South Shore Line

Half-hour service during week-ends between Chicago and Michigan City, and eight new trains, including several operating on extra fast time, are among the features of the new summer service schedules of the South Shore Line, which became effective April 29 on central standard time, but adapted in convenience to daylight time. Time folders were distributed detailing the changes.

Of particular interest to theater-goers along the South Shore Line is the new 10:15 p.m. South Bend limited out of Randolph Street, Chicago, 11:15 p.m., Chicago time, which is late enough to allow most theater patrons in Chicago to see the last act before leaving for their train. This train will make faster time than the usual schedule, arriving in South Bend at 12:30 a.m.

No Relief from Parking in Cleveland

The Cleveland, Ohio, City Council has definitely refused to provide relief for operation by the Cleveland Railway by prohibiting all auto parking on downtown streets. It has proposed to allow automobiles to drive through unoccupied safety zones outside the congested areas. thus increasing the probabilities of delaying and tying up railway service at intersections marked by traffic lights. The traffic ordinance is about to be revised, but in all the discussions over parking, the protests of the Cleveland Railway have gone unheeded.

Recently Colonel Joseph H. Alexander, president of the Cleveland Railway, figured that the company would be in money (and the fare that much nearer a reduction) if it paid for parking space in downtown garages for all the automobiles that can be parked on Euclid Avenue between the Public Square and East 22d Street during the ten business hours of the day, provided also that no parking was allowed between these limits. Due to fire plugs, safety zones, bus stops and regular no parking spaces, there is room for only 170 automobiles to park on Euclid between the Square and East 22d Street, he discovered. The parking limit is one hour, consequently the company would be willing to pay for the storage of 1,700 automobiles for one hour each. If this plan should be put into effect, Mr. Alexander estimated that six minutes would be cut off the schedule of each Euclid Avenue car and the money saved from accidents and delays would pay the parking costs five times over.

When one of the Councilmen proposed to take all daytime parking off the downtown streets, the protests of the merchants had the effect of killing the proposal in one day. Since then the merchants have succeeded in preventing any changes whatsoever in downtown parking regulations.

W. D. Mahon on Co-operation with the Mitten Management

IT IS a new step in the industrial undertakings of America, but I feel that we understand one another thoroughly and that the spirit of co-operation will be developed fully, fairly and honestly, and that, if that is done, it is bound to bring the results that we are striving for. It will take time and patience to work it out, but both sides thoroughly understand one another, and I have great hopes for this plan for the future. It brings, as it were, a new day to this great army of industrial workers that follow this occupation and have struggled for so many years to bring about a better and happier day, and I feel assured that, if our plans work out as we have outlined them, it is the beginning of a happier and brighter hour for the street and electric railway workers of America.—*"The Motorman, Conductor and Motor Coach Operator," official organ of the Amalgamated Association.*

Rehearing Fare Petitions in Los Angeles Denied

The California Railroad Commission has denied the petitions for re-hearing filed by the City of Los Angeles, and the Venice Branch of the Los Angeles Chamber of Commerce, in the matter of the revision of the rates of Pacific Electric Railway. In announcing its decision the commission made sweeping changes in the rate structure of that utility, with radical reductions in one-way and round-trip fares, and established a basic 5-cent zone fare, with a shortening of the zone, in the city of Los Angeles. The petition for re-hearing filed by the City of Los Angeles related to the local fares in the City of Los Angeles only. The petition filed by the Venice Chamber of Commerce Branch related to the fares between Los Angeles and Venice only.

Rates fixed by the commission are intended as experimental fares only, and the commission will hold itself open to make such revision in its order as developments, during the actual operation of the fares, may appear to warrant. In its original order the commission found the financial condition of the utility warranted action calculated to stimulate traffic and increase its earnings. Governor Young was appealed to by the City Council to take action against the new fares.

Hearings on Pass Abolition in Chicago Resumed

Public hearings on the petition of the Chicago Rapid Transit Company, Chicago, Ill., to abolish weekly passes and the three-for-a-quarter ticket rate and establish a flat 10-cent fare in the city of Chicago was continued on April 26 until May 15 by the Illinois Commerce Commission. The delay in the hearings was the second requested and obtained by the city since the petition was filed by the company last February. Patrick J. Moynihan, as acting chairman of the commission, presided over the recent hearing, taking the place of David H. Jackson, who resigned at the request of Governor Small.

When Summer Comes, Mid-West Parlor Service Will Follow

Temporary discontinuance of parlor car service between Chicago and cities in the Fox River Valley, was announced by the Chicago, Aurora & Elgin Railroad to go in effect April 1. The service, which was discontinued on account of light patronage, will probably be resumed in about two months, when the heavy summer travel begins, according to an official of the company.

Sunday Passes Popular in Gary

Sales of the 25-cent Sunday pass, recently offered to patrons of the Gary Railways, Gary, Ind., totaled 1,500 on April 15, the first day of the sale, and more than 1,700 on April 22. The pass entitles the bearer to travel anywhere on the company's system for as many trips as he likes, on the day of issue. As a result of the popularity of the new form of ticket, headway on the 27-mile Gary-Valparaiso interurban division has been increased on Sundays from every two hours each way to hourly service.

For an Institute of Traffic Research

Formation of a national institute for street and highway traffic research will be discussed at a conference in St. Louis, Mo., on May 23, sponsored by *Nation's Traffic,* devoted to street and highway traffic problems.

In this connection formation of a traffic institute to centralize all efforts in research for safety and other phases of the problem is made in the same publication by H. M. Gould. The Gould plan calls for a group of workers sponsored by every interest affected who would conduct field research under actual conditions in a large city which would permit the use of its streets as a laboratory. Reports rendered on the tests would be universally disseminated. The public would be given the necessary information through paid advertisements in the press. The plan is to "get the facts and then broadcast them."

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Recent Bus Developments

New Route in South Bend

The Chicago, South Bend & Northern Indiana Railway was granted permission on April 21 by the Indiana Public Service Commission to operate buses on a new route in the west portion of South Bend, Ind. This line will be an extension of the local railway service, connecting the Washington Avenue, Lincoln Way and Portage Avenue car lines. Transfers will be given from street cars to the bus line upon payment of an additional 2 cents, while bus passengers will pay a 10-cent fare and have free transfer privileges to the street cars.

Project in Berkeley Carries

The new 5-cent privately operated bus line project in Berkeley, Cal., was approved by a vote of 13,466 to 9,328 at the election which was held there May 1. It provided for operation of buses from the center of Berkeley to the Golden Gate Ferry Pier, local service to cost 5 cents and trans-bay service 18 cents as opposed to 7-cent local fares and 21-cent ferry fares now charged on the Key System Transit Company lines and on the Southern Pacific. Recently the Key System was authorized to substitute bus service on certain railway routes in Berkeley.

The bus proposition was presented as an ordinance ten months ago, but the Berkeley City Council refused to pass it. In a hot campaign the initiative was bitterly assailed by the two rival railroad companies. Supporters of the new bus line declared that the Key System and the Southern Pacific are rendering unsatisfactory service because of costly duplication.

Postmaster Heywood of Berkeley is the sponsor of the bus initiative. President A. O. Stewart of the Golden Gate Ferry Company said that he would be ready to run buses on the new route within 60 days after the necessary permission had been granted by the State Railroad Commission.

Would Carry Out Former Bus Railway Proposal for Buffalo

Plans for a city-wide co-ordinated bus and railway system for Buffalo, N. Y., suggested two years ago by the International Railway and the International Bus Corporation, but rejected by the City Council under the former commission form of municipal government, have been revived by the Chamber of Commerce and representative business organizations of the city in co-operation with the new Buffalo city government. Mayor Frank X. Schwab, in sending out invitations to business organizations of the city to co-operate in carrying out the proposals, said that he was anxious to have this system started as soon as possible in the interests of better transportation; that if the International wanted to establish a co-ordinated bus-trolley system and treated the city fairly he would be glad to make a recommendation to the Council. He said he was in favor of a universal transfer between trolley and bus lines and that consideration would be given to permits for operation on Bailey Avenue.

Will Substitute for Cars on San Diego Line

Permission has been granted by the California Railroad Commission to the San Diego Electric Railway to abandon service along First Street, between B and Laurel Streets in San Diego. The order calls for bus service under a 10-minute headway.

All-Bus Operation in White Plains and Harrison

The Public Service Commission on April 23 authorized the Westchester Street Transportation Company, Inc., to substitute buses for street cars on its Silver Lake Line. This substitution will be the final step in the policy of the company to substitute buses for street cars in the city of White Plains and the town of Harrison. Both the city and town have given their consent to the substitution.

Bus Business in Newport Sold

The Newport Electric Corporation, Newport, R. I., sold its bus properties to the Newport & Providence Railway on March 1, 1928.

Substitution in Massachusetts Cities

The Norton, Attleboro & Taunton Street Railway, controlled by the three Massachusetts cities named, plans to abandon service and to substitute bus transportation. Both the physical and financial condition of the company, it is said, make the move imperative. City governments of the towns involved have been asked to study the situation and provide the names of bus companies that may desire to furnish service

Five-Cent Fare on Roanoke Line Refused

The Roanoke Railway & Electric Company has refused to grant the citizens of the Williamson Road section a 5-cent bus fare. The railway buses operate from 5:45 a.m., until 10:15 p.m., but the citizens are urging that they be operated until at least 11:20 p.m.

Tulsa Gives Convention Visitors a Sight-Seeing Trip

The Oklahoma Union Railway and the Union Transportation Company, a subsidiary, have adopted the sight-seeing bus idea and give visitors to the more important conventions a two-hour trip over Tulsa in their large parlor buses. An employee of the company points out the places of interest in the city.

Commission Approves Additional Bus Routes for Public Service

Approval of municipal consents to the Public Service Co-ordinated Transport, Newark, N. J., for the operation of ten de luxe buses between Paterson and Hackensack was granted on April 21 by the Board of Public Utility Commissioners. The rates of fare for the service are:

Within Paterson, 10 cents; Paterson to East Paterson, 15 cents; Paterson to the Maywood-Hackensack line, 20 cents, and Paterson to Hackensack, 25 cents.

The board also approved municipal consents granted the company for an extension of the Elizabeth-Roselle Park route to Westfield and for the operation of fourteen buses. The extension would have four zones each at a 5-cent fare.

Additional Bus Routes Sought for Buffalo Suburban Run

Application was made on May 1 by John T. Burke, as received of the Hamburg Railway, to the New York Public Service Commission for a certificate for the operation of an additional bus route in Ridge Road to make a loop or circuit in the existing bus lines operated between Lackawanna and Blasdell, N. Y.

The Buffalo City Council has rejected the application of the receivers for permission to operate buses in Buffalo as part of the proposed Buffalo-Perrysburg bus route. The company sought permission to use certain streets in Buffalo to the Buffalo-Lackawanna city line. Opposition to the proposed bus line was voiced by representatives of the Buffalo & Lackawanna Traction Company and the Buffalo & Erie Railway. Buffalo retail interests favored the project.

Bus Preparations in Keokuk

The Keokuk Motor Coach Company, Keokuk, Iowa, has been organized to establish and operate motor coach lines in Keokuk, Iowa, to supplant the local railway service, scheduled for suspension on May 15. Five buses will be put into service at the opening of its new schedule and others will be added.

Paul O. Dittmar, representing a Chicago accounting firm; G. E. Eldridge, Reo Motor Company, Lansing, Mich.; Roy E. Green, First Trust & Saving Bank, Whiting, Ind., and Henry S. Walker, Keokuk, are the incorporators. Mr. Dittmar is president, Mr. Walker vice-president, and Mr. Green secretary.

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Financial *and* Corporate

City Companies Do Well

Despite unfavorable economic factors, statistics covering 1927 operations show traffic in large cities practically a constant. Other groups not doing so well. Results from bus operation greatly improved

FROM reports for 1927 made to the American Electric Railway Association it is apparent that the city railway systems are about holding their own but that the interurban and suburban companies are finding it more and more difficult to maintain themselves. The private automobile and the intercity bus are taking a heavy toll from the traffic of the latter groups. The results on the city lines, on the contrary, are quite encouraging. A loss of only 1.26 per cent in revenue passengers in a year of sub-normal industrial activity suggests that with the recovery of business activity the electric railways in cities may look for improvement in their business. The operating ratio of 70.91 per cent for the city lines is a healthy one. The stability of operating expenses is also a source of encouragement and the ability of this group of companies to increase its net income substantially in an unfavorable year is regarded as significant.

As Edmund J. Murphy, chief statistician of the association, writing in *Aera* for May sees it, results of operations of electric railways in 1927 indicate that by efficient management and careful economies the companies were able to offset to a large degree the effects of rather unfavorable traffic conditions. Not all of the companies, of course, were able to do this equally well. The city companies were most successful in this respect, but they make up so large a portion of the industry that their inclusion in any statement, particularly the inclusion of the companies operating in the large metropolitan cities, makes such a statement reflect principally conditions prevailing on city lines which are generally much more satisfactory than on other lines.

Net Income Conserved

In 1927 industrial conditions were uneven and in some industries there was actual depression. The resulting decrease in the number of people employed affected electric railway traffic adversely, as it always does. In spite of these conditions, however, the industry was able to conserve very nearly all of its net income. Although there was a decrease of 1.68 per cent in railway operating revenues in 1927 compared with 1926, the gross income remaining after the payment of operating expenses and taxes but before the payment of fixed charges was only 0.31 per cent less than in 1926.

The railways were aided in their efforts to offset the effects of decreasing traffic by a higher average rate of fare resulting from the numerous increases in fares granted during both 1926 and 1927. Thus, while the number of revenue passengers carried decreased 2.49 per cent the amount of passenger revenue collected from these passengers decreased only 1.94 per cent. Operating expenses decreased 1.77 per cent. This was partly due to curtailed service and partly to the lower cost of materials in 1927. The curtailment of service was, of course, a natural consequence of the decreased traffic and indicates that the managements were watching their traffic demands closely and were quick to adapt their service to the reduced riding.

There was a decrease of 1.24 per cent

Statistics Compiled by American Electric Railway Association

COMBINED OPERATIONS OF 322 COMPANIES

	1927	1926	Increase or (D) Decrease	Per Cent Increase or (D) Decrease
Railway operating revenue	$794,074,168	$804,443,915	(D) $10,369,747	(D) 1.29
Railway operating expense	584,392,950	592,911,000	(D) 8,518,050	(D) 1.44
Net operating revenue	$209,681,218	$211,532,915	(D) $1,851,697	(D) 0.88
Operating ratio (per cent)	73.59	73.70	(D) 0.11	(D) 0.15
Miles of track	32,106	32,181	(D) 75	(D) 0.23
Revenue passengers	10,505,747,511	10,720,056,130	(D) 214,308,619	(D) 2.00
Total passengers	13,363,554,346	13,633,643,345	(D) 270,088,999	(D) 1.98
Car miles (revenue)	1,890,886,569	1,902,308,748	(D) 11,422,179	(D) 0.60

COMBINED OPERATIONS OF 322 RAILWAY COMPANIES AND 153 CONTROLLED BUS UNDERTAKINGS

	1927	1926	Increase or (D) Decrease	Per Cent Increase or (D) Decrease
Operating revenue	$832,404,720	$835,453,968	(D) $3,049,248	(D) 0.36
Operating expense	619,932,322	623,935,892	(D) 4,003,570	(D) 0.64
Net operating revenue	$212,472,398	$211,518,076	$954,322	0.45
Operating ratio (per cent)	74.47	74.68	(D) 0.21	(D) 0.28
Miles of track and bus route	38,208	37,091	1,117	3.01
Revenue passengers	10,982,306,589	11,093,354,850	(D) 111,048,261	(D) 1.00
Total passengers	13,908,729,695	14,046,471,096	(D) 137,741,401	(D) 0.99
Car and bus-miles	2,032,128,843	2,016,886,829	15,242,014	0.76

Statistics Compiled by American Electric Railway Association

Part I—Combined Operating Reports of 206 Electric Railways for the Calendar Year 1927 Compared With 1926

TABLE I—COMBINED INCOME STATEMENT

	1927	1926	Increase or (D) Decrease—Total	Increase or (D) Decrease—Per Cent	Cents per Car-Mile 1927	Cents per Car-Mile 1926	Cents per Car-Mile Increase or (D) Decrease
Railway operating revenue	$596,557,500	$606,709,768	(D) $10,152,268	(D) 1.68	42.68	42.91	(D) 0.54
Railway operating expenses	439,117,138	446,989,954	(D) 7,872,816	(D) 1.77	31.41	31.61	(D) 0.63
Net operating revenue	$157,440,362	$159,719,814	(D) $2,279,452	(D) 1.43	11.27	11.30	(D) 0.27
Net revenue: Auxiliary operations	2,791,263	2,498,219	293,044	11.73	0.20	0.18	11.11
Taxes	37,408,745	38,111,905	(D) 703,160	(D) 1.85	8.79	2.70	(D) 0.74
Operating income	$122,822,880	$124,106,128	(D) $1,283,248	(D) 1.04	2.68	8.78	0.11
Non-operating income	11,009,196	10,132,196	877,000	8.65	0.79	0.71	11.27
Gross income	$133,832,076	$134,238,324	(D) $406,248	(D) 0.31	9.58	9.49	0.95
Deductions from gross income	112,089,985	111,606,083	483,902	0.43	8.02	7.89	1.65
Net income	$21,742,091	$22,632,241	(D) $890,150	(D) 3.94	1.56	1.60	(D) 2.50
Dividends	(a) $15,628,165	(b) $15,150,954	$477,211	3.14	.....	.....	.....
Operating ratio (per cent)	73.61	73.67	(D) 0.06	(D) 0.09	.....	.....	.....
Ratio: Net income to operating revenue	3.64	3.73	(D) 0.09	2.42	.....	.....	.....

(a) Reported by 46 companies (b) Reported by 44 companies.

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TABLE II—OPERATING EXPENSES BY PRIMARY ACCOUNTS

	1927	1926	Increase or (D) Decrease	Per Cent Increase or (D) Decrease	Cents per Car-Mile		
					1927	1926	Increase or (D) Decrease
Way and structures	$62,867,189	$65,180,526	(D) $2,313,337	(D) 3.55	4.50	4.61	(D) 2.39
Equipment	58,879,020	59,154,421	(D) 275,401	(D) 0.47	4.21	4.18	0.72
Power	59,541,411	61,254,557	(D) 1,713,146	(D) 2.80	4.26	4.33	(D) 1.62
Conducting transportation	189,327,879	193,855,596	(D) 4,527,717	(D) 2.34	13.55	13.70	(D) 1.09
Traffic	2,192,066	2,364,156	(D) 172,090	(D) 7.28	0.16	0.17	(D) 5.88
General and miscellaneous	64,615,962	63,860,737	755,225	(D) 1.18	4.62	4.52	2.21
Transportation for investment—Credit	—231,153	—477,483	(D) —246,330	(D) 51.59	—0.02	—0.03	(D) 33.33
Total operating expense	(a) $439,117,138	(b) $446,989,954	(D) $7,872,816	(D) 1.77	(a) 31.41	(b) 31.61	(D) 0.63

(a) Includes $1,924,764 undistributed expense. (b) Includes $1,797,444 undistributed expense.

in the number of passenger car-miles operated, compared with a decrease of 2.64 per cent in the number of passengers carried, including both revenue and transfer passengers. The difference in these figures indicates that a relatively greater amount of service in proportion to the traffic was given in 1927 than in 1926. This is borne out by the number of passengers carried per car-mile, which was 7.1 in 1927 and 7.2 in 1926. The number of passenger car-hours was reduced 2.33 per cent, a greater decrease than in the case of the car-miles operated. The average speed of the cars, therefore, was increased from 10.1 miles per hour to 10.2 miles per hour, a very substantial improvement in operating efficiency.

Because of this greater efficiency the average number of miles operated by each car was increased from 39,226 in 1926 to 39,549 in 1927. At the same time the average number of car-hours operated by each car was reduced from 3,836 in 1926 to 3,673 in 1927. All of these improvements in operating efficiency contributed materially to the reduction in operating expenses which, together with the higher fares, enabled the electric railways to make as good a showing as they have under the conditions which obtained during the year.

These are conclusions based on the

TABLE III—OPERATING STATISTICS—206 COMPANIES

	1927	1926	Increase or (D) Decrease	Per Cent Increase or (D) Decrease
Passenger car-miles	1,350,121,164	1,366,937,151	(D) 16,815,987	(D) 1.24
Total revenue car-miles	1,397,697,154	1,413,785,326	(D) 16,088,172	(D) 1.14
Revenue passengers (1)	7,710,221,883	7,906,409,142	(D) 196,187,259	(D) 2.49
Transfer passengers (2)	1,606,430,890	1,660,556,010	(D) 54,125,120	(D) 3.26
Total passengers (1)	9,376,506,790	9,630,681,258	(D) 254,174,468	(D) 2.64
Passenger revenue	$551,711,496	$562,579,731	(D) $10,868,235	(D) 1.94
Revenue car-hours (3)	119,737,456	122,630,246	(D) 2,892,790	(D) 2.36
Passenger car-hours (3)	118,455,928	121,279,429	(D) 2,823,501	(D) 2.33
Miles of single track	23,421	23,472	(D) 51	(D) 0.22
Passenger cars operated (4) (a)	31,628	32,272	(D) 644	(D) 2.00

(a) Average maximum number of passenger cars in service daily. (1) Reported by 197 companies. (2) Reported by 137 companies. (3) Reported by 183 companies. (4) Reported by 178 companies.

TABLE IV—SIGNIFICANT RATIOS DERIVED FROM THE FOREGOING TABLES—206 COMPANIES

	1927	1926	Per Cent Increase or (D) Decrease
Railway operating revenue	$596,557,500	$606,709,768	(D) 1.67
Per mile of single track	$25,471	$25,848	(D) 1.46
Gross income	$133,832,076	$134,238,324	(D) 0.30
Per mile of single track	5,714	5,719	(D) 0.09
Passenger revenue	$551,711,496	$562,579,731	(D) 1.93
Per revenue passenger	(1) 7.0c.	(1) 6.9c.	(D) 1.43
Per total passenger	(1) 5.7c.	(1) 5.7c.	
Per mile of single track	$23,556	$23,968	(D) 1.72
Per passenger car-mile	40.9c.	41.2c.	(D) 0.73
Per car operated	(3) $15,472	(3) $15,448	0.16
Per passenger car-hour	(2) $4.14	(2) $4.14	
Revenue passengers	(1) 7,710,221,883	(1) 7,906,409,142	(D) 2.48
Per mile of single track	(1) 344,391	(1) 352,461	(D) 2.29
Per passenger car-mile	(1) 5.8	(1) 5.9	(D) 1.69
Per car operated	(4) 216,038	(4) 216,830	(D) 0.37
Per passenger car-hour	(5) 60	(5) 60	
Total passengers	(1) 9,376,506,790	(1) 9,630,681,258	(D) 2.64
Per mile of single track	(1) 418,818	(1) 429,328	(D) 2.45
Per passenger car-mile	(1) 7.1	(1) 7.2	(D) 1.39
Ratio: Transfer passengers to revenue passengers (per cent)	20.8	21.0	(D) 0.95
Revenue car-miles	1,397,697,154	1,413,785,326	(D) 1.14
Per mile of single track	59,677	60,233	(D) 0.92
Per car operated	(6) 39,549	(6) 39,226	0.82
Per car-hour	(2) 10.2	(2) 10.1	0.99
Car-hours	(2) 119,737,456	(2) 122,630,246	(D) 2.36
Per car operated	(7) 3,673	(7) 3,836	(D) 4.25

(1) Reported by 197 companies. (2) Reported by 183 companies. (3) Reported by 172 companies. (4) Reported by 170 companies. (5) Reported by 179 companies. (6) Reported by 173 companies. (7) Reported by 155 companies.

Part II—City Lines—Combined Reports of 79 Companies Operating City Lines Exclusively

TABLE V—COMBINED INCOME STATEMENT

	1927	1926	Increase or (D) Decrease	Per Cent Increase or (D) Decrease
Railway operating revenue	$423,287,423	$426,891,791	(D) $3,604,368	(D) 0.84
Railway operating expense	300,181,253	305,157,248	(D) 4,975,995	(D) 1.63
Net operating revenue	$123,106,170	$121,734,543	$1,371,627	1.13
Net revenue: Auxiliary operations	763,911	571,486	192,425	33.67
Taxes	27,229,379	27,299,746	(D) 70,367	(D) 0.26
Operating income	$96,640,702	$95,006,283	$1,634,419	1.72
Non-operating income	6,741,557	6,115,574	625,983	10.24
Gross income	$103,382,259	$101,121,857	$2,260,402	2.24
Deductions from gross income	80,020,008	79,408,654	611,354	0.77
Net income	$23,362,251	$21,713,203	$1,649,048	7.59
Dividends	(a) $12,228,788	(b) $12,234,622	(D) $5,834	(D) 0.05
Operating ratio (per cent)	70.91	71.48	(D) 0.57	(D) 0.80
Ratio: Net income to operating revenue	5.52	5.09	0.43	8.45

(a) Reported by 28 companies. (b) Reported by 25 companies.

TABLE VI—OPERATING EXPENSES BY PRIMARY ACCOUNTS

	1927	1926	Increase or (D) Decrease	Per Cent Increase or (D) Decrease
Way and structures	$39,546,808	$41,599,587	(D) $2,052,779	(D) 4.94
Equipment	40,339,211	40,932,018	(D) 592,807	(D) 1.45
Power	39,324,674	40,068,001	(D) 743,327	(D) 1.86
Conducting transportation	137,796,327	140,401,944	(D) 2,605,617	(D) 1.86
Traffic	747,250	987,719	(D) 240,469	(D) 24.35
General and miscellaneous	40,727,585	39,552,665	1,174,920	2.97
Transportation for investment—Cr.	—102,365	—84,521	—17,844	21.11
Total operating expense	(a) $300,181,253	(b) $305,157,248	(D) $4,975,995	(D) 1.64

(a) Includes $1,801,763 undistributed expense. (b) Includes $1,699,835 undistributed expense.

TABLE VII—OPERATING STATISTICS

	1927	1926	Increase or (D) Decrease	Per Cent Increase or (D) Decrease
Passenger car-miles	991,363,648	997,369,635	(D) 6,005,987	(D) 0.60
Total revenue car-miles	1,000,017,800	1,007,181,217	(D) 7,163,417	(D) 0.72
Revenue passengers (1)	6,202,325,617	6,281,044,386	(D) 78,718,769	(D) 1.26
Transfer passengers (2)	1,403,379,717	1,443,535,434	(D) 40,155,717	(D) 2.79
Total passengers (1)	7,637,754,069	7,758,690,453	(D) 120,936,384	(D) 1.56
Passenger revenue	$408,712,840	$412,445,636	(D) $3,732,796	(D) 0.91
Revenue car-hours (3)	88,298,298	90,063,223	(D) 1,764,925	(D) 1.96
Passenger car-hours (3)	88,148,855	89,912,072	(D) 1,763,217	(D) 1.96
Miles of single track	9,890	9,896	(D) 6	(D) 0.07
Passenger cars operated (4) (a)	24,176	24,429	(D) 253	(D) 1.04

(a) Average maximum number of cars in service daily. (1) Reported by 77 companies. (2) Reported by 66 companies. (3) Reported by 73 companies. (4) Reported by 70 companies.

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complete reports of 206 electric railways for the calendar years 1927 and 1926. The total operating revenues of these companies was $596,557,500 in 1927 compared with $606,709,768 in 1926. These revenues represent approximately 65 per cent of the total revenues of all the electric railways in the United States.

In addition to these 206 companies reports were also received from 116 other companies. Due to the fact that they carry on a joint railway, power and light business and that it was impossible for them to segregate their taxes and fixed charges between their railway operations and these other operations, they could not be included in the tables showing a complete income statement. They are, however, included in the table of combined operations and are shown again with the operations of 153 affiliated motor bus lines included.

The companies referred to in the combined statement represent approximately 76 per cent of the entire industry. The trends shown by this larger group, however, do not differ materially from those of the group of 206 companies, indicating that the latter are fairly typical of the industry as a whole. The table of combined operations therefore, is interesting only for the magnitude of the operations shown and for the testimony it gives as to the accuracy and representativeness of the group of 206 companies. The table, including the bus operations of electric railways, is of special interest because it shows that with the results of bus operations added in the net revenue of the industry is increased. This is the first year that this has occurred and it reflects the encouraging progress being made by the electric railways in their bus operations.

While the addition of the buses in 1926 reduced the net operating revenue of the whole group, the inclusion of the

Part III—Interurban Lines—Combined Reports of 50 Companies Operating Interurban Lines Exclusively

TABLE VIII—INCOME STATEMENT

	1927	1926	Increase or (D) Decrease	Per Cent Increase or (D) Decrease
Railway operating revenue.	$19,379,502	$20,017,059	(D) $637,557	(D) 3.19
Railway operating expense.	16,710,117	16,867,780	(D) 157,663	(D) 0.94
Net operating revenue...	$2,669,385	$3,149,279	(D) $479,894	(D) 15.24
Net revenue: Auxiliary operations.....	158,634	173,479	(D) 14,845	(D) 8.56
Taxes.....	1,015,533	1,073,176	(D) 57,643	(D) 5.38
Operating income.....	$1,812,486	$2,249,582	(D) $437,096	(D) 19.44
Non-operating income....	526,734	493,157	33,577	6.81
Gross income.....	$2,339,220	$2,742,739	(D) $403,519	(D) 14.72
Deductions from gross income.....	4,033,483	4,093,382	(D) 59,899	(D) 1.47
Net income.....	*$1,694,263	*$1,350,643	(D) $343,620	.....
Dividends.....	(a) $350,951	(a) $366,290	(D) $15,339	(D) 4.19
Operating ratio (per cent)..	86.22	84.26	1.96	2.32
Ratio: Net income to operating revenue.....	.....	.....	.....	.....

*Deficit. (a) Reported by seven companies.

TABLE IX—OPERATING EXPENSES BY PRIMARY ACCOUNTS

	1927	1926	Increase or (D) Decrease	Per Cent Increase or (D) Decrease
Way and structures.	$3,208,776	$3,131,788	$76,988	2.45
Equipment.....	1,948,419	1,945,988	2,431	0.12
Power.....	2,845,843	3,030,514	(D) 184,671	(D) 6.10
Conducting transportation.....	5,203,130	5,262,344	(D) 59,214	(D) 1.13
Traffic.....	350,654	323,081	27,573	8.53
General and miscellaneous.....	3,130,719	3,158,689	(D) 27,970	(D) 0.89
Transportation for investment—Cr..	—724	—3,200	(D) —2,476	(D) 77.38
Total operating expense.....	(a) $16,710,117	(b) $16,867,780	(D) $157,663	(D) 0.94

(a) Includes $23,300 undistributed expense. (b) Includes $18,576 undistributed expense.

TABLE X—OPERATING STATISTICS

	1927	1926	Increase or (D) Decrease	Per Cent Increase or (D) Decrease
Passenger car-miles....	32,726,281	33,706,326	(D) 980,045	(D) 2.91
Total revenue car-miles	44,285,258	44,480,585	(D) 195,327	(D) 0.44
Revenue passengers (1)	34,801,282	36,819,171	(D) 2,017,889	(D) 5.49
Transfer passengers (2)	739,951	776,852	(D) 26,901	(D) 4.76
Total passengers (1)....	37,047,065	39,104,334	(D) 2,057,269	(D) 5.27
Passenger revenue.....	$10,824,181	$11,565,912	(D) $741,731	(D) 6.42
Revenue car-hours (3)..	1,554,344	1,588,246	(D) 33,902	(D) 2.14
Passenger car-hours (3)..	1,170,676	1,198,070	(D) 27,394	(D) 2.29
Miles of single track....	2,912	2,902	10	0.34
Passenger cars operated (1) (a).....	534	528	6	1.14

(a) Average maximum number of passenger cars in service daily.
(1) Reported by 46 companies.
(2) Reported by 11 companies.
(3) Reported by 39 companies.

Part IV—City and Interurban Lines—Combined Reports of 77 Companies Operating Combined City and Interurban Lines

TABLE XI—INCOME STATEMENT

	1927	1926	Increase or (D) Decrease	Per Cent Increase or (D) Decrease
Railway operating revenue.....	$153,890,575	$159,800,918	(D) $5,910,343	(D) 3.70
Railway operating expense.....	122,225,768	124,964,926	(D) 2,739,158	(D) 2.20
Net operating revenue	$31,664,807	$34,835,992	(D) $3,171,185	(D) 9.11
Net revenue: Auxiliary operations.....	1,868,718	1,753,254	115,464	6.58
Taxes.....	9,163,833	9,738,983	(D) 575,150	(D) 5.91
Operating income....	$24,369,692	$26,850,263	(D) $2,480,571	(D) 9.24
Non-operating income	3,740,905	3,523,465	217,440	6.17
Gross income.....	$28,110,597	$30,373,728	(D) $2,263,131	(D) 7.46
Deductions from gross income.....	28,036,494	28,104,047	(D) 67,553	(D) 0.25
Net income.....	$74,103	$2,269,681	(D) $2,195,578	(D) 96.74
Dividends.....	(a) $3,048,426	(b) $2,550,042	$498,384	19.54
Operating ratio, per cent	79.42	78.20	1.22	1.56
Ratio: Net income to operating revenue....	0.04	1.42	(D) 1.38	(D) 97.19

(a) Reported by 11 companies. (b) Reported by 12 companies.

TABLE XII—OPERATING EXPENSES BY PRIMARY ACCOUNTS

	1927	1926	Increase or (D) Decrease	Per Cent Increase or (D) Decrease
Way and structures....	$20,111,605	$20,449,151	(D) $337,546	(D) 1.66
Equipment.....	16,591,390	16,276,415	314,975	1.93
Power.....	17,370,894	18,156,042	(D) 785,148	(D) 4.33
Conducting transportation.....	46,328,422	48,191,308	(D) 1,862,886	(D) 3.87
Traffic.....	1,094,162	1,053,356	40,806	3.87
General and miscellaneous.....	20,757,658	21,149,383	(D) 391,725	(D) .86
Transportation for investment—Credit...	—128,064	—389,762	(D) —261,698	(D) 67.15
Total operating expense.....	(a) $122,225,768	b $124,964,926	(D) $3,739,158	(D) 2.19

(a) Includes $99,701 undistributed expense. (b) Includes $79,033 undistributed expense.

TABLE XIII—OPERATING STATISTICS

	1927	1926	Increase or (D) Decrease	Per Cent Increase or (D) Decrease
Passenger car-miles...	326,031,235	335,861,190	(D) 9,829,955	(D) 2.93
Total revenue car-miles.....	353,394,096	362,123,524	(D) 8,729,428	(D) 2.42
Revenue passengers (1)	1,473,094,984	1,588,545,585	(D) 115,450,601	(D) 7.23
Transfer passengers (2)	202,311,222	216,243,724	(D) 13,932,502	(D) 6.45
Total passengers (1)...	1,701,705,656	1,832,886,471	(D) 131,180,815	(D) 7.16
Passenger revenue....	$132,174,475	$138,568,183	(D) $6,393,708	(D) 4.62
Revenue car-hours (3)	29,884,814	30,978,777	(D) 1,093,963	(D) 3.54
Passenger car-hours (3)	29,136,397	30,169,287	(D) 1,032,890	(D) 3.43
Miles of single track...	10,619	10,674	(D) 55	(D) 0.52
Passenger cars operated (4) (a).....	6,918	7,315	(D) 397	(D) 5.43

(a) Average maximum number of passenger cars in service daily.
(1) Reported by 74 companies.
(2) Reported by 60 companies.
(3) Reported by 71 companies.
(4) Reported by 62 companies.

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bus figures in 1927 increased the net revenue of the group. In other words, the buses operated at a deficit in 1926 but at a substantial margin above operating expenses in 1927. The decrease of $1,851,697 in net operating revenue, shown in the table is changed to an increase of $954,322 in the table in which bus and railway operations are combined.

In the case of the 206 companies for which complete operating data were obtained, the net operating revenue of the whole group of 206 companies was $157,440,360 in 1927 and $159,719,814 in 1926, a decrease of $2,279,454 or 1.43 per cent, which should be compared with the decrease of $10,152,268 in operating revenues. The difference is due to a decrease of $7,872,816 in operating expenses. The operating ratio—that is, the ratio of operating expenses to operating revenues—was reduced from 73.67 per cent in 1926 to 73.61 per cent in 1927.

From auxiliary operations this group obtained a net revenue of $2,791,263 in 1927, an increase of $293,044 or 11.73 per cent over 1926. Taxes were reduced from $38,111,905 in 1926 to $37,408,745 in 1927, or 1.85 per cent, a decrease which also helped to keep the reduction in net income down to a minimum. The decrease in taxes is principally due to the reduction in gross revenues and not to any special relief from taxes.

Non-operating income, or income from investments, increased from $10,132,196 in 1926 to $11,009,196 in 1927, or 8.65 per cent. This produced a gross income before fixed charges of $133,382,076, or only 0.31 per cent less than in 1926.

Deductions from gross income were $112,089,985 in 1927. This compared with $111,606,083 in 1926, the increase being 0.43 per cent. This left a net income of $21,742,091 in 1927, which was $890,150 less than the net income in 1926, the percentage of decrease being 3.94.

Income of City Companies Increased

When the statement is broken down into groups according to the types of companies, it is seen that the city companies made a very remarkable showing. There are 79 of these companies and their net corporate income was increased from $21,713,203 in 1926 and $23,362,251 in 1927—an increase of $1,649,048, or 7.59 per cent. This is in spite of the fact that they carried 120,936,384 fewer passengers in 1927, or 1.56 per cent of the 1926 traffic. The companies operating in the large metropolitan cities, of course, contributed heavily to the production of this result. Higher fares held the decrease in passenger revenue resulting from the decreased traffic to 0.91 per cent, which operating economies and reduced costs changed into an increased net operating revenue.

The interurban lines and the companies doing a combination city and interurban service were not as successful as the city companies in contending with adverse conditions. The problems of the interurban lines are, of course, much more acute and difficult of solution than are those of the city systems.

Part V—Combined Statements of All Three Types of Companies on a Car-Mile Basis

TABLE XIV—INCOME STATEMENT OF 79 CITY COMPANIES, 50 INTERURBAN COMPANIES AND 77 COMPANIES OPERATING COMBINED CITY AND INTERURBAN LINES

	City Lines			Interurban Lines			City and Interurban Lines		
	Cents per Car-Mile		Per Cent Increase or (D) Decrease	Cents per Car-Mile		Per Cent Increase or (D) Decrease	Cents per Car-Mile		Per Cent Increase or (D) Decrease
	1927	1926		1927	1926		1927	1926	
Railway operating revenue	42.33	42.38	(D) 0.12	43.76	45.00	(D) 2.76	43.55	44.13	(D) 1.32
Railway operating expense.	30.02	30.30	(D) 0.92	37.73	37.92	(D) 0.50	34.59	34.51	0.23
Net operating revenue..	12.31	12.08	1.90	6.03	7.08	(D) 14.83	8.96	9.62	(D) 6.86
Net revenue: Auxiliary operations.....	0.08	0.06	33.33	0.35	0.39	(D) 10.26	0.53	0.48	10.42
Taxes.....	2.72	2.71	0.37	2.29	2.41	(D) 4.98	2.59	2.69	(D) 3.72
Operating income.....	9.67	9.43	2.55	4.09	5.06	(D) 19.17	6.90	7.41	(D) 6.88
Non-operating income.....	0.67	0.61	9.84	1.19	1.11	7.21	1.05	0.97	8.25
Gross income.....	10.34	10.04	2.99	5.28	6.17	(D) 4.43	7.95	8.38	(D) 5.13
Deduction from gross income.....	8.00	7.88	1.52	9.11	9.20	(D) 0.98	7.93	7.76	2.19
Net income.....	2.34	2.16	8.33	*3.83	*3.03	(D) 26.40	0.02	0.62	(D) 96.78

*Deficit.

The group of 50 companies operating interurban service exclusive carried 2,017,889 fewer revenue passengers in 1927 than they did in 1926, the decrease amounting to 5.49 per cent. Not all of this loss is due to the private automobile, of course. Part of it can be attributed to semi-depressed industrial conditions and slowing up of business activities in 1927 compared with 1926.

The interurban lines did not enjoy rates any higher in 1927 than they did in 1926; in fact, there seems to have been a slight reduction in the average rate obtained, so that the passenger revenue of the interurban lines decreasing even more than their revenue passengers, the figure being 6.42 per cent for passenger revenue and 5.49 per cent for revenue passengers.

Due to improvement in other than passenger revenue, however, to total railway operating revenue of the interurban group decreased only 3.19 per cent, the amount being $19,379,502 in 1927 compared with $20,017,059 in 1926. Operating expenses were reduced from $16,867,780 in 1926 to $16,710,117 in 1927, or 0.94 per cent. The operating ratio thus increased, rising from 84.26 per cent in 1926 to 86.22 per cent in 1927. Net operating revenue was reduced from $3,147,279 in 1926 to $2,669,385 in 1927, or 15.24 per cent. Taxes decreased slightly but not enough to have any material effect upon the statement. The same may be said of non-operating income, which was increased by $33,577. The decrease in net operating revenue, however, was carried through almost unchanged into gross income before charges, which amounted to $2,339,220 in 1927 compared with $2,742,739 in 1926, the decrease being 14.72 per cent.

This was not enough to meet the fixed charges of the group, which amounted to $4,033,483 in 1927 and $4,093,382 in 1926, a decrease of 1.47 per cent. As a result there was a deficit from operations of $1,694,263 in 1927 compared with a similar deficit of $1,350,643 in 1926.

The returns of the group of 77 companies operating combined city and interurban service follow very closely the same trends as the exclusively interurban group, as might be expected from the fact that it is made up principally of interurban, semi-interurban and suburban companies with some city operation included. Their net corpo-

As the Author Sees It

THE private automobile has become practically a necessity in the rural sections served by the interurban lines and its use in those sections is almost universal. The trips that formerly could be taken only by an interurban or steam railroad can now be taken in the family car without a moment's notice and with no reference to the schedules or the time-tables.

No action can be taken against such competition except the improvement of the service to a point where it will be more convenient and more appreciated than the automobile.

TABLE XV—OPERATING EXPENSES OF 79 CITY COMPANIES, 50 INTERURBAN COMPANIES AND 77 COMPANIES OPERATING COMBINED CITY AND INTERURBAN LINES

	City Lines			Interurban Lines			City and Interurban Lines		
	Cents per Car-Mile		Per Cent Increase or (D) Decrease	Cents per Car-Mile		Per Cent Increase or (D) Decrease	Cents per Car-Mile		Per Cent Increase or (D) Decrease
	1927	1926		1927	1926		1927	1926	
Way and structures.....	3.96	4.13	(D) 4.12	7.24	7.04	2.84	5.69	5.65	0.70
Equipment.....	4.03	4.06	(D) 0.74	4.40	4.37	0.69	4.69	4.49	4.45
Power.....	3.93	3.98	(D) 1.26	6.45	6.81	(D) 5.58	4.92	5.02	(D) 1.99
Conducting transportation	13.79	13.94	(D) 1.08	11.75	11.83	(D) 0.68	13.11	13.31	(D) 1.50
Traffic.....	0.07	0.10	(D) 30.00	0.79	0.73	8.23	0.31	0.29	6.89
General and miscellaneous.	4.07	3.93	3.56	7.07	7.10	(D) 0.42	5.88	5.84	0.68
Transportation for invest. Cr.....	—9.01	—0.01	.....	.....	.....	.....	—0.04	—0.11	(D) 63.64
*Total operating expenses	30.02	30.30	(D) 0.92	37.73	37.92	(D) 0.50	34.59	34.51	0.23
*Undistributed expenses included in total.....	0.18	0.17	5.88	0.05	0.04	25.00	0.03	0.02	50.00

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rate income was reduced from $2,269,681 in 1926 to $74,103 in 1927, a decline of $2,195,578, or 96.74 per cent.

The number of revenue passengers carried by this group of companies decreased 115,450,601, or 7.27 per cent, compared with a decrease of 1.26 per cent for the city lines and 5.49 per cent for the interurban lines.

Net operating revenue dropped from $34,835,992 to $31,664,807, or 9.11 per cent. This represented a decrease of $3,171,185. As against this there was a decrease in taxes of $575,150 and increases of $115,464 in net revenue from auxiliary operations and $217,440 in non-operating income. The gross income before charges, therefore, decreased $2,263,131 or 7.46 per cent, the actual amounts being $30,373,728 in 1926 and $28,110,597 in 1927. The deductions from gross income were reduced from $28,104,047 in 1926 to $28,036,494 in 1927, the difference being $67,553 representing a decrease of one-quarter of 1 per cent.

The cost of conducting transportation, which is the heaviest item of expenditure, decreased 3.87 per cent in the combination group as against a decrease of 1.13 per cent in the interurban group and a decrease of 1.86 per cent in the city group.

Further analysis of these reports is promised in an article in *Aera* for June in an attempt to locate a little more definitely the sources of the industry's weaknesses and strength. The figures which have been compiled for each of the groups will be further broken down into smaller groups, according to their size, with the idea of showing how the smaller companies are doing in comparison with the larger companies.

Reorganization of Detroit United Ahead

New company will include only main line and Detroit, Monroe & Toledo Short Line. Common stock in voting trust for five years. A. L. Drum new president

ANNOUNCEMENT is made of the completion of the plan of reorganization of the Detroit United Railway, Detroit, Mich., which went into receivership on March 10, 1925. It embraces only the Detroit United Railway and the Detroit, Monroe & Toledo Short Line, together with all the bus companies owned by the former but not including the rail properties of Jackson & Chicago Railway, Detroit & Port Huron Short Line and Detroit, Almont & Northern Railroad, the stocks of which were owned by the Detroit United Railway. The Detroit United consists of interurban railways extending from the boundary of Detroit to various points in Michigan, the lines in Detroit having been sold to the city.

Financial Set-up of New Company

The plan of reorganization involves formation of a new company capitalized as follows: $3,350,000 first mortgage 7 per cent bonds due July 1, 1958; $4,915,000 adjustment mortgage 6 per cent bonds due July 1, 1958, and 200,000 shares of common stock of no-par value.

Holders of Detroit United Railway first and collateral trust five-year 6 per cent bonds due 1929, may participate in the reorganization by depositing their bonds with the Central Union Trust Company, New York, on or before May 31. At the time of the receivership these bonds were outstanding to the amount of $8,275,000. Since the receivership, instalments of $2,500,000 of the purchase price of the city lines sold to Detroit and pledged under the mortgage of these bonds have been collected and 31 per cent of the $8,275,000 bonds has been paid and distributed pro rata among the bondholders, reducing the original $1,000 bond outstanding at receivership to $690. Holders of these bonds who agree to the reorganization will receive for each bond $50 cash, $550 principal amount of adjustment mortgage 6 per cent bonds and four shares of common stock.

Subscription Rights to Bondholders

In addition, depositing bondholders are entitled to subscribe to the underwriting syndicate to a maximum sum of $500 for each original $1,000 bond. According to the plan the syndicate will receive in securities of the new company for each $900 cash subscribed: $1,000 principal amount of first mortgage 7 per cent bonds, $108 principal amount of adjustment 6 per cent bonds and 39.37 shares, approximately, of common stock.

The senior issue of bonds of the new company will be known as first mortgage and collateral trust bonds; they will be secured by a mortgage embracing all or substantially all of the lines of railroad, franchises and equipment owned by the new company; there shall also be pledged all shares of stock and securities vested

Part VI—Derived Ratios

TABLE XVI—SIGNIFICANT RATIOS DERIVED FROM THE FOREGOING TABLES

	79 City Companies			50 Interurban Companies			77 Companies Operating Both City and Interurban Lines		
	1927	1926	Per Cent Increase or (D) Decrease	1927	1926	Per Cent Increase or (D) Decrease	1927	1926	Per Cent Increase or (D) Decrease
Railway operating revenue	$423,287,423	$426,891,791	(D) 0.84	$19,379,502	$20,017,059	(D) 3.19	$153,890,575	$159,800,918	(D) 3.70
Per mile of single track	$42,800	$43,138	(D) 0.78	$6,655	$6,898	(D) 3.52	$14,492	$14,971	(D) 3.20
Gross income	$103,382,259	$101,121,857	2.24	$2,339,220	$2,742,739	(D) 14.71	$28,110,597	$30,373,728	(D) 7.45
Per mile of single track	$10,453	$10,218	2.30	$803	$945	(D) 15.03	$2,647	$2,864	(D) 6.99
Passenger revenue	$408,712,840	$412,445,636	(D) 0.91	$10,824,181	$11,565,912	(D) 6.41	$132,174,475	$138,568,183	(D) 4.61
Per revenue passenger	(1) 6.5c.	(1) 6.5c.	.....	(5) 27.6c.	(5) 27.9c.	(D) 1.08 (2)	8.4c. (2)	8.2c.	2.44
Per total passenger	(1) 5.3c.	(1) 5.3c.	.....	(5) 26.0c.	(5) 26.3c.	(D) 1.14 (2)	7.3c. (2)	7.1c.	2.82
Per mile of single track	$41,326	$41,678	(D) 0.84	(10) $3,717	(10) $3,985	(D) 6.73	$12,447	$12,982	(D) 4.12
Per passenger car-mile	(7) 41.2c.	(7) 41.4c.	(D) 0.48	(10) 33.1c.	(10) 34.3c.	(D) 3.50	40.5c.	41.3c.	(D) 1.94
Per car operated	(7) $15,266	(7) $15,254	0.08	(11) $15,419	(11) $16,656	(D) 7.43 (12)	$16,194 (12)	$16,010	(D) 1.15
Per passenger car-hour	(3) $4.21	$4.18	0.72	(6) $5.55	(16) $5.80	(D) 4.31 (4)	$3.89 (4)	$3.96	(D) 1.77
Revenue passengers	(1) 6,202,325,617	(1) 6,281,044,386	(D) 1.25	(5) 34,801,282	(5) 36,819,171	(D) 5.48 (2)	1,473,094,984 (2)	1,588,545,585	(D) 7.27
Per mile of single track	(1) 633,796	(1) 641,578	(D) 1.21	(5) 13,108	13,926	(D) 5.87 (2)	148,094 (2)	158,86	(D) 6.79
Per passenger car-mile	(1) 6.3	(1) 6.4	(D) 1.56	(5) 1.2	(5) 1.2	..... (2)	4.8 (2)	5.0	(D) 4.00
Per car operated	(7) 230,005	(7) 230,832	(D) 0.36	(13) 56,674	(13) 60,800	(D) 6.79 (12)	177,435 (12)	180,735	(D) 1.83
Per passenger car-hour	(8) 65	(8) 65	.....	(14) 24.5	(14) 25.1	(D) 2.39 (4)	47 (4)	49	(D) 4.08
Total passengers	(1) 7,637,754,069	(1) 7,758,690,453	(D) 1.56	(5) 37,047,065	(5) 39,104,334	(D) 5.26 (2)	1,701,705,656 (2)	1,832,886,471	(D) 7.16
Per mile of single track	(1) 780,478	(1) 792,512	(D) 1.52	(5) 13,954	(5) 14,790	(D) 5.65 (2)	171,077 (2)	183,325	(D) 6.68
Per passenger car-mile	(1) 7.8	(1) 7.8	.....	(5) 1.3	(5) 1.3	..... (2)	5.5 (2)	5.8	(D) 5.17
Ratio: Transfer passengers to revenue passengers (per cent)	22.6%	23.0%	(D) 1.74	2.1%	2.1%	.....	13.7%	13.6%	0.74
Revenue: Car-miles	1,000,017,800	1,007,181,217	(D) 0.71	44,285,258	44,480,585	(D) 0.44	353,394,096	362,123,524	(D) 2.41
Per mile of single track	101,114	101,777	(D) 0.65	15,208	15,328	(D) 0.78	33,279	33,926	(D) 1.91
Per car operated	(7) 37,783	(7) 37,700	0.22	(15) 62,235	(15) 62,501	(D) 0.43 (12)	43,958 (12)	42,641	3.09
Per car-hour	(3) 10.2	(3) 10.1	0.99	(6) 11.7	(6) 11.6	0.86 (4)	9.9 (4)	9.9	.....
Car-hours	(3) 88,298,298	(3) 90,063,223	(D) 1.96	(6) 1,554,344	(6) 1,588,246	(D) 2.13 (4)	29,884,814 (4)	30,978,777	(D) 3.53
Per car operated	(9) 3,494	(9) 3,699	(D) 5.54	(16) 3,573	(16) 3,715	(D) 3.82 (17)	4,374 (17)	4,331	0.99

(1) Reported by 77 companies
(2) Reported by 74 companies.
(3) Reported by 73 companies.
(4) Reported by 71 companies.
(5) Reported by 46 companies.
(6) Reported by 39 companies.
(7) Reported by 70 companies.
(8) Reported by 72 companies.
(9) Reported by 64 companies.
(10) Reported by 50 companies.
(11) Reported by 40 companies.
(12) Reported by 62 companies.
(13) Reported by 38 companies.
(14) Reported by 36 companies.
(15) Reported by 41 companies.
(16) Reported by 33 companies.
(17) Reported by 58 companies.

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in the new company in accordance with the plan. These bonds are limited to $5,000,000 at any one time outstanding. They are to be redeemable on any interest date, in whole or in part, on 30 days' notice at 107 to July 1, 1932, and at declining premiums to 1 per cent from July 1, 1952 to 1956.

Adjustment mortgage bonds are to be limited to $4,915,000 outstanding at any one time and are, in effect, a second mortgage on the properties of the company taken into the reorganization. Interest on these bonds is a contingent charge, being payable if earned as defined under its mortgage, and is cumulative. The adjustments are convertible between Jan. 1, 1930, and July 1, 1938, into common stock at rate of four shares for each $100 principal amount of bonds. The adjustments are callable on any interest date on 30 days' notice at par and accrued interest.

The authorized amount of stock will be 400,000 shares, of which only 200,000 shares are to be issued in reorganization and the balance only for conversion of adjustment bonds until expiration of the conversion period. Shares issued in reorganization are to go to Theodore G. Smith, A. L. Drum and George T. Bishop, as voting trustees, for a period expiring not later than July 1, 1933.

INCOME OF REORGANIZED COMPANY ESTIMATED

Holders of the $3,000,000 Detroit, Monroe & Toledo Short Line first mortgage 5 per cent bonds may become parties to the reorganization of that property by depositing their bonds on or before May 31. All common stock of the reorganized Toledo line will be owned by the new Detroit United company and will be pledged under the latter's first mortgage. The new Toledo company will authorize not exceeding $2,000,000 of first mortgage bonds, to bear not more than 7 per cent interest, which may be issued only against acquisitions of property after Jan. 1, 1929.

It will issue in reorganization $1,800,000 general mortgage bonds, all of which will go to depositing holders of the old company's first mortgage 5 per cent bonds in ratio of $600 general mortgage bonds for each $1,000 first mortgage 5 per cent bond, a 60 per cent basis. The new general mortgage bonds will mature July 1, 1958; interest will not become due until Jan. 1, 1930, and during that year 1 per cent will become due with increasing amount in subsequent years to Jan. 1, 1935, when interest shall become fixed at 5½ per cent annually.

A. L. Drum will be president of the new company. He has estimated earnings of the new company (other than the reorganized Detroit, Monroe & Toledo Railway) for the first year after reorganization, after depreciation and taxes, other than federal income taxes, and payment of interest on certain bonds covering lines sold to the city of Detroit, but before other interest charges, at $804,769. If realized, that sum will be sufficient to meet interest charges of the new company, other than the Toledo line, aggregating not more than $608,791, including full 6 per cent interest on the adjustment bonds. According to Mr. Drum the depreciation fund will be ample to provide for payment of maturing car and equipment trust obligations. The properties and equipment are in satisfactory condition and the new company will commence business with ample working capital.

Under the reorganization plan three new companies will be formed. They will be the Eastern Michigan Railways, the parent company, with two subsidiary companies, the Highway Motor Bus Company to own and operate the bus lines, and the Detroit, Monroe & Toledo Company to own the present electric railway line between Detroit and Toledo, Ohio.

Indianapolis & Cincinnati Traction Sold at Foreclosure

The property of the Indianapolis & Cincinnati Traction Company, Rushville, Ind., was bought on April 30 by Charles T. De Hore, Cincinnati, and Leroy E. Eastman, Toledo, Ohio, for $500,000. Will M. Frazee, receiver, sold the road in an attempt to satisfy mortgages aggregating $2,600,000. The sale was approved the following day by the Rush County Circuit Court at Rushville, Ind. The interurban service will be continued, but it is understood that Mr. De Hore and his associates made the purchase primarily to develop the company's electric power and light business. A. M. Miller, Bryan, Ohio, also will be connected financially with the new owners of the Indianapolis & Cincinnati. The road was started by the late Charles L. Henry in 1903 and divisions were built to Connersville and Greensberg, Ind. The company went into the hands of Mr. Henry as receiver in 1925.

Recommendations Advanced for San Francisco Municipal Railway

Valuation of the San Francisco Municipal Railways, San Francisco, Cal., was set at $8,636,839 in a special report filed with the Board of Public Works by Fred Boeken, superintendent of the railways. The municipal lines were built with the proceeds of an issue of $5,000,000 of municipal bonds. These bonds are being retired at the rate of $200,000 a year and in another six years the entire issue will have been taken up.

Superintendent Boeken advocated that the railways be divorced from politics, declaring it should be plain to everyone that in order to remove the city roads as well as all public utilities from political influence and retain public confidence a public utilities commission should be created. Further he said that no more unprofitable extensions should be undertaken, that transfers between buses and cars should be discontinued and that the Marina bus route should be abolished. Elimination of bus-car transfers will save $45,668 yearly and elimination of the Marina line will save $9,750 yearly.

Four lines are reported as losing money. Increased service on the Geary Street line is recommended.

Traffic, Fare and Wage Figures

The number of revenue passengers, including bus passengers, reported by 211 companies to the American Electric Railway Association for February, 1928, compared with February, 1927, is as follows:

February, 1928	799,993,415
February, 1927	786,058,606
Increase, per cent	1.77

The increase shown is due to the fact that there was an extra day in February, 1928. When the figures are placed on a daily average basis the result is as follows:

DAILY AVERAGE TRAFFIC

February, 1928	27,586,980
February, 1927	28,073,522
Decrease, per cent	1.23

The decrease registered by the daily average figures is the smallest since May, 1927, and indicates that a very slow improvement is taking place in traffic conditions. Part of the improvement is due to improved business conditions in the North West, Far West and in the New England states. The failure to show a greater average improvement is due to the semi-depressed condition of business in the great industrial region north of the Ohio and east of the Mississippi Rivers.

Average cash fares in cities of 25,000 population and over:

Month	Cents
March 1, 1928	8.1186
Feb., 1928	8.1070
March 1, 1927	7.9170

The increase in the average fare since Feb. 1, 1928, was caused by an increase in the cash fare in Baltimore, Md., from 8 cents to 9 cents, and in Madison, Wis., from 8 cents to 10 cents.

The average maximum hourly rates paid motormen and conductors in two-man service by companies operating 100 or more miles of single track follow:

Month	Average Hourly Rate Cents	Index Number 1913=100 Per Cent
March 1, 1928	57.38	210.57
Feb., 1, 1928	57.37	210.53
March 1, 1927	56.97	209.06

Earnings in Kansas City Largest Since Property Taken Over

March earnings of the Kansas City Public Service Company, Kansas City, Mo., were the largest of any month since the property was taken over by the present owners in 1926. The report, coming in the face of a loss and decrease the first two months of the year, was considered very encouraging. The report shows March earnings were $191,489, or $11,226 more than the amount permitted under the franchise agreement. This increase in earnings reduces to $98,521, the amount of the accumulated shortage for the year so far. The largest previous earnings were in December, 1926, when receipts totalled $173,048. In 1927 the earnings of the company fell $453,421 short of the earnings permitted by the city. During the period of January to April 15, railway receipts decreased 4.52 per cent, but bus receipts increased 3.57 per cent.

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Legal Notes

CALIFORNIA—*Motorman of Interurban Train Need Not Stop When Pedestrians Leave Sidewalk and Approach Track*

The motorman of an interurban train operating over city streets is not obliged to stop each time he observes that a pedestrian leaves the sidewalk and approaches the track. Where such a train is proceeding in plain sight, unobstructed to the vision of the pedestrian, the motorman can assume that the latter will exercise care for his own protection. [Richardson vs. Southern Pacific Co., 263 P., 1039.]

CONNECTICUT—*Duty of Deaf Pedestrian When Walking Near Track*

A person afflicted with deafness such as would prevent him from hearing a trolley gong or bell should exercise that care for his own safety which a reasonably prudent man would exercise under like circumstances of deafness, and if he walks close to a trolley track, he must realize that a passing car might strike him. Hence, if he did not look back at intervals to learn of the possible approach of a car he was contributorily negligent, as a matter of law. [Kerr vs. Connecticut Co., 140 A., 751.]

DISTRICT OF COLUMBIA—*Passenger Was Injured While Car Was Being Braked For a Stop*

The request of a railway to the trial court of an instruction that a passenger was guilty of contributory negligence if he left his seat while the car was moving and failed to protect himself by grasping a strap or other means of support was held properly refused, since modern traffic conditions require that a street railway passenger desiring to leave at a certain point shall be prepared to alight when the car reaches that point. [Capital T. Co. vs. Lyon, 24 F. (2d), 262.]

FEDERAL CIRCUIT COURT—*Responsibility of Holding and Management Companies For Negligence of Operating Company*

A citizen of the United States brought suit to recover damages for personal injuries alleged to have been sustained through negligent operation of a street railway car in the Phillipines. The defendants were four corporations, the Phillipine operating corporation and three American corporations, one owning all of the capital stock of the operating company (except directors' shares), a management company and a company controlling the management company. The court dismissed the action as to the operating company for lack of jurisdiction, and non-suit was entered in the case of the management company and its controlling company, as the management company was held to be simply an agent. But the American company holding and controlling the stock of the railway was held responsible because its contract provided that it should appoint the operating manager, who had full authority to supervise the operation of the railway, including the appointment of employees, purchase of supplies, etc. Hence it was responsible for any negligent acts of the operating company. [Coston vs. Manila E. Co., et al., 24 F. (2d), 383.]

FEDERAL SUPREME COURT—*Taxation of Interstate Commerce, Even if Different From That of Intrastate, Will be Upheld if Not Disproportionate*

Connecticut established a mileage tax on motor vehicles used in interstate commerce for the improvement of its highways, though no such mileage tax was imposed on intrastate motor vehicles. The constitutionality of this statute was upheld by the Federal Supreme Court in the absence of evidence that the tax was a substantially greater burden than the tax rate actually assessed on intrastate business. It also held a state could impose more than one form of tax on interstate commerce, provided the aggregate charge bears a reasonable relation to the privileges granted. The Supreme Court also refused to consider a clause of the statute excluding from the highways of the State motor carriers which refused to pay a charge for their use, as the court assumed that the plaintiff would not persist in its refusal to pay the tax, now that it has been declared to be constitutional. [Interstate Buses Corporation vs. Blodgett, 48 S.Ct., 230.]

KANSAS—*Railway Not Responsible When Pedestrian Walks From Behind Car Into Automobile and Is Injured*

A girl ten years old, while crossing a street, walked into the side of a passing automobile after she had emerged from behind a standing street car. An ordinance of the city forbade street cars to remain in the place where this car was standing at the time, and the company was sued for negligence because of this fact. The court held, however, that the ordinance was enacted to facilitate movement of traffic and not to provide pedestrians and automobile drivers with opportunity for observation. Hence, the company was not liable for the accident, as a matter of law. [Sheldon vs. Wichita R. & L. Co., 264 P., 732.]

MASSACHUSETTS—*Collision with Car on Right Hand Side of the Road*

An automobile driven on the right side of the road struck a standing trolley car whose headlight was facing so that it shone into the eyes of the automobile driver. The claim of the latter for damages on the ground of being dazzled by the light was refused. [Keefe vs. E.M.S.R. Co., 159 N.E., 528.]

NEW JERSEY—*Where Two Parties Cause Injury by Their Negligence, Each Should Pay Half of the Damages*

A person was injured by the joint negligence of a taxicab driver and a trolley car operator. After decision for the plaintiff, she collected from the railway 5/7 of the total damages awarded, under threat of execution on its property, and collected 2/7 from the taxicab company. In a later suit between the two defendants, the court held that the railway could collect from the taxicab company such part of the judgment as it had paid in excess of one-half of the total amount, as its payment was made under stress and not voluntarily. [P. S. Ry. vs. Matteucci, 140 A., 442.]

NEW YORK—*Appellate Division Has Power to Investigate Alleged Systematic "Ambulance Chasing"*

Three representative associations of lawyers in New York City petitioned the Appellate Division to investigate alleged practices in "ambulance chasing" in that city. The court held that it had power to do, even if there was no precedent for such action. [In re Association of Bar of City of New York, 227 N.Y.S.]

PENNSYLVANIA—*Passenger Steps on Partially Folded Car Step*

A passenger about to enter a car stepped on a partially folded step, which went down about 3 in. under her weight, causing her to fall to the ground and sustain injuries. There was no evidence that the mechanism of the step was at fault, and the court held that the passenger should have noted the partially folded position of the step and not attempted to use it. [Murray et ux. vs. P. R. T. Co., 140 A., 522.]

WEST VIRGINIA—*Company Must Be Careful Not to Injure Passengers or Licensees When Starting Cars*

A woman boarded a car to see that her child and a maid got on safely. After leaving the car she re-boarded it to give further instructions to the maid. While leaving the car the second time she was injured by the sudden starting of the car. The court held the railway company must use due care not to put a car in motion while persons are getting on and off, whether they are passengers or merely licensees. [Malone vs. M. V. Traction Co., 141 S.E., 440.]

TEXAS—*Power of State to Control Use of Highways*

The Legislature has power to forbid the use of highways to common carriers and it may place restrictions on this use by creating a commission to administer regulations for common carriers, provided the constitutional limitations of the legislative powers are not exceeded. The prohibition of the operation of motor buses as common carriers unless they first obtain from the Railroad Commission a certificate of public convenience and necessity, but permitting the issue of temporary certificates to existing motor bus carriers, was held valid. [Exparte Sparks, 2 S. W., (2d), 449.]

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Personal Items

Adam Gschwindt to Manage Rockford's Utilities

The man chosen to manage the combined railway, gas and electric properties in Rockford, Ill., is Adam Gschwindt, whose energy, executive ability and general outlook played a part in his recent appointment as general manager. His service record with the American Gas & Electric Company covers a period of 30 years. In 1898 he entered the public utility field in Scranton, Pa., with the City Steam Company. Afterwards this company was merged with the Scranton Electric Company and two years later Mr. Gschwindt was transferred to the head offices of the American Gas & Electric Company, Hudson

Adam Gschwindt

Terminal Building, New York, as vice-president and director of purchases.

But by far his most important assignment with this company was in 1913 when he went to Rockford, Ill., as vice-president and general manager of the Rockford Electric Company. In February, 1926, he was appointed receiver for the Rockford City Traction Company and Rockford & Interurban Railway Lines by the Circuit Court of Winnebago County, Ill. It was during that year that the main portion of the system was practically reconstructed. It was sold in February, 1927, by court order. This company, together with other acquisitions by T. M. Ellis, the purchaser at that time, was recently acquired by the Rockford Electric Company. With this acquisition came the decision to combine the properties under one management.

A. V. Louer Goes to Albany—F. J. Keenan at Glens Falls

Abram V. Louer has been made general superintendent of the United Traction Company, Albany, N. Y. For the past eight years he has served as assistant general manager of the Hudson Valley Railway with headquarters in Glens Falls.

Early in his career Mr. Louer was employed at Buffalo and on Long Island. In 1905 he entered the employ of the Schenectady Railway and was assigned to the engineering department. Subsequently, he was transferred to the transportation department, and for nearly three seasons had charge of the company's recreation park. After Mr. Hamilton, then general manager of the Schenectady Railway, was appointed general superintendent of the United Traction Company in Albany, he had Mr. Louer appointed to the transportation department of that company. This was in 1911 and Mr. Louer remained in Albany until 1920 when he went to Glens Falls, taking an active interest not only in his railway duties but in civic and social activities of that city.

Frank J. Keenan, general freight and passenger agent, succeeds M. Louer at Glens Falls. He has been associated with the Hudson Valley Railway for twenty years.

Messrs. Morse, O'Brien, Burr and Burkhalter in Changes

Changes in the personnel of the Florida Motor Lines, Inc., Orlando, Fla., under the executive management of Stone & Webster, Inc., are as follows:

George G. Morse, formerly betterment engineer of Florida Motor Lines, Inc., in Orlando, Fla., in direct charge of maintenance, was appointed general manager on April 1, succeeding W. M. Bird and C. E. Bostwick, Jr., the latter now with the Savannah Electric & Power Company. He will have charge of all operations in the state, with headquarters at Orlando. Mr. Morse has had a long career with Stone & Webster interests. He served as superintendent of transportation, Jacksonville Traction Company, superintendent of railways, El Paso Electric Company, and general superintendent, Galveston-Houston Electric Railway. Mr. Morse has been associated with the Florida Motor Lines, Inc., since November, 1925.

E. T. O'Brien, formerly superintendent of Orange Belt Motor Line, Inc., and the Orlando Rapid Transit Company, has been transferred to Tampa as superintendent Florida Motor Lines, Inc.

R. G. Burr, formerly master mechanic, West Palm Beach, Fla., Florida Motor Lines, Inc., is now located at Orlando as superintendent Orlando Rapid Transit Company and Orange Belt Motor Line, Inc. He was formerly associated with Stone & Webster interests in Ponce, Porto Rico, and Houston, Tex.

E. R. Burkhalter, formerly general foreman, Orlando Shops, Florida Motor Lines, Inc., is now master mechanic at that point, succeeding H. A. Stockbridge, who has resigned.

Murray Sullivan—General Manager for Salt Lake Receivers

Murray Sullivan was appointed general manager for the receivers of the Salt Lake & Utah railroad, with headquarters at Salt Lake City, Utah, effective April 19, 1928. For more than four years Mr. Sullivan has been connected with this road, having served first as assistant to the president, and later as assistant to the receivers.

Prior to this connection Mr. Sullivan was affiliated with the American International Corporation's railway enterprise in China, first as senior engineer, and later succeeding G. A. Kyle as chief engineer, with headquarters at Peking. This enterprise was financed by the American International Corporation, and the Siems-Carey Railway & Canal Company was the contractor on this work, which comprised the building of some 1,600 miles of main lines of rail-

Murray Sullivan

ways. However, after making a great many surveys, chaotic conditions, resulting from the revolution, made it impossible to proceed, and work was suspended indefinitely pending the establishment of a stable government in China. During his stay in China, Mr. Sullivan was also appointed chief engineer of the Peking-Tientsin Highway Commission, and was in charge of the construction of a modern highway between these two cities. This work was carried on as a famine relief measure. In addition to and concurrently with the railway work, Mr. Sullivan was appointed by the Chinese Government a member of the Commission on Railway Technics, at the time of the organization of that Commission in 1917, and served on this commission until 1921. The work of this commission was in connection with the standardization of the railways of China. In his relief work he handled the purchasing and shipping of large quantities of clothing and food for the Czech army and for the destitute refugees in Siberia.

Before leaving China Mr. Sullivan was honored by election to a full membership in the Chinese Institute of Engineers. He was also general manager of the Chinese Engineering & Development Company with headquarters at Peking. Before going to China he

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served as office engineer of the Oregon Short Line for about seven years, prior to which time he was engaged upon the location and construction of the El Paso and Northeastern Railway and the Kansas City, Mexico & Orient Railway.

Mr. Sullivan is a member of various engineering societies and associations, including the American Society of Civil Engineers and the Utah Society of Engineers.

H. B. Lingeman and A. E. Miller Advanced at Youngstown

H. B. Lingeman has been appointed purchasing agent of the Pennsylvania-Ohio Electric Company, Youngstown, Ohio, by vice-president and general manager MacCalla, to succeed the late R. J. Pike. Mr. Lingeman has been supervisor of stores of the system for ten years. In that position he was one of the chief assistants of Mr. Pike. In his new position he will have charge of purchasing, stores, invoice and traffic departments.

Although his early training included preparatory courses in law Mr. Lingeman did not pursue that profession but entered the field of public utilities in the employ of the Coney Island & Brooklyn Railroad in the claim department. Some time later he was promoted to the transportation department as assistant to the general superintendent. In 1909 he was again promoted, becoming purchasing agent of the Coney Island system, and continuing at that post until 1914 when the smaller system was merged with the Brooklyn Rapid Transit System. In the amalgamation Mr. Lingeman was made assistant general storekeeper, a position he resigned in 1917 to join the staff of the Underwriters' Laboratories of New York.

Mr. Lingeman joined the Pennsylvania-Ohio forces in March, 1918, upon appointment as supervisor of stores and invoice department. He has built up the stores department to the large and important branch of the Penn-Ohio service it is today.

Mr. Lingeman was born in Brooklyn, N. Y. He attended the grade and high schools there. He entered the Hefferly Institute, taking the preparatory course in law and reading law in the office of Stephen M. Hoye, New York.

Associated with him in his work will be Allen E. Miller, who went with the system in January, 1917, and who has been closely associated with Mr. Lingeman in charge of the traffic work of the department. Upon Mr. Lingeman's advancement, Mr. Miller was designated to succeed him as supervisor of stores and invoices in addition to his duties in the traffic department.

Mr. Miller resigned from the Pennsylvania-Ohio Electric in May, 1918, and saw fifteen months' service in France as railway transportation officer. Upon the close of the war he returned as traffic manager. His earlier education was received in the Girard high school supplemented by study of interstate commerce law.

D. J. Graham in Charge at Winnipeg

A. W. McLimont, president of Winnipeg Electric Company, Winnipeg, Man., Canada, recently announced the appointment of Dale J. Graham, as manager of the company's electric railway utility, reporting to C. H. Dahl, assistant general manager in charge of operation.

The new manager in Canadian territory comes from Youngstown, Ohio, where he has been assistant manager of a railway system of approximately the same size as that in Greater Winnipeg. He served in Youngstown for six years, becoming affiliated with the Youngstown Municipal Railway in 1922 as engineer of maintenance-of-way.

In recognition of his services, in 1926 Mr. Graham was made assistant manager of railways of the Pennsylvania-Ohio Electric Company, with especial charge, in addition to his general duties,

Dale J. Graham

of a new commercial department formed to sell more rides through the application of good salesmanship. Several aides were associated with him in this department, where was centered all matters that had to do with checking and developing the service of the various transportation lines and making them have a stronger appeal to the traveler and to the people of the community served. His work aimed at building up and developing both freight and passenger business.

Prior to his connection at Youngstown he had been engineer with the American Steel Wire Company, Worcester, Mass., and before that with the Railroad Administration and with the New York State Railways at Rochester. His career also includes service with the Pennsylvania and with the Santa Fé Railroads.

Mr. Graham, both a civil and electrical engineer, was graduated from the University of Pennsylvania in 1910.

W. J. Serrill Head of Standardization Movement

William J. Serrill of the United Gas Improvement Company, Philadelphia, Pa., was recently elected chairman of the American Engineering Standards Committee. Mr. Serrill succeeds C. E. Skinner of the Westinghouse Electric & Manufacturing Company, who has been chairman of the Standards Committee for the past three years.

Illinois Commerce Commission Head Resigns

David H. Jackson, chairman of the Illinois Commerce Commission, resigned his post on April 25 at the request of Governor Len Small. He was appointed last year by the Governor to succeed Frank L. Smith, erstwhile U. S. senator-elect. The Governor had charged that there was dissension among commission members under the Jackson administration and delays in issuing orders. In reply Mr. Jackson stated that his resignation was being tendered only because the Governor has the right to remove him at will. He denied both charges and insisted that the Governor's "real reason" for demanding his resignation "is because he found I could not be handled."

Obituary

R. J. Pike

R. J. Pike, purchasing agent and head of the stores and traffic departments of the Pennsylvania-Ohio Electric Company, Youngstown, Ohio, died recently. Mr. Pike was with the Youngstown system fourteen years.

Early in his career he was employed in Scranton, Pa., with the Delaware & Hudson Coal Company, and then went to Syracuse, N. Y., where he first became associated, as secretary, with R. P. Stevens.

After serving two years with the Auburn & Syracuse Electric Railroad he went to Allentown with Mr. Stevens, who then became president of the Lehigh Valley Transit Company. In 1914 when Mr. Stevens went to Youngstown as president of what has developed into the present Penn-Ohio System, Mr. Pike again accompanied him as secretary and statistician, subsequently being promoted to general purchasing agent in charge of all purchases and stores.

Mr. Pike was born in Oneida, N. Y., 45 years ago. He attended the Oneida schools and in 1903 was graduated from the Utica School of Commerce. He was a member of many civic, business and fraternal bodies, including the Youngstown Chamber of Commerce, the Pittsburgh Association of Purchasing Agents, and many other civic enterprises.

CHARLES F. WOODWARD, active in the development of street railways 35 years ago, died recently in Wakefield, Mass. He was the founder and first president of the first street railway in the vicinity of Wakefield, and the first president of the Wakefield & Stoneham Street Railway.

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Manufactures and the Markets

World Engineering Congress Program Outlined

With the opening date of the first World Engineering Congress set for Oct. 30, 1929, at Tokio, Maurice Holland, executive secretary of the American committee arranging for engineers of this country to participate, made public the program of the event as outlined by the Japanese authorities.

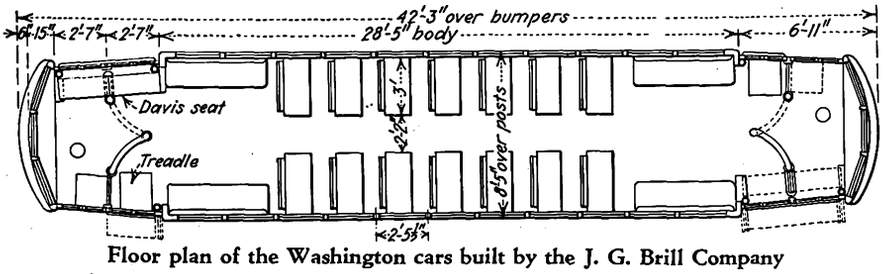
The congress will extend through the month of November, the official languages being English and Japanese. The first week of the meeting is to be devoted to technical papers and social meetings and the second week to inspection trips in Tokio and the vicinity. The next fortnight will be set apart for trips throughout Japan, arranged to give engineers attending the congress an opportunity to visit the great industrial centers of the country and to study Japanese engineering problems.

The World Engineering Congress aims to deal with many of the world's vital problems, particularly those relating to public works, communication and transportation, power, chemicals, textiles and aeronautical and automotive engineering. Almost every activity of daily life as touched upon by modern science and invention will be reflected in the deliberations of the Congress.

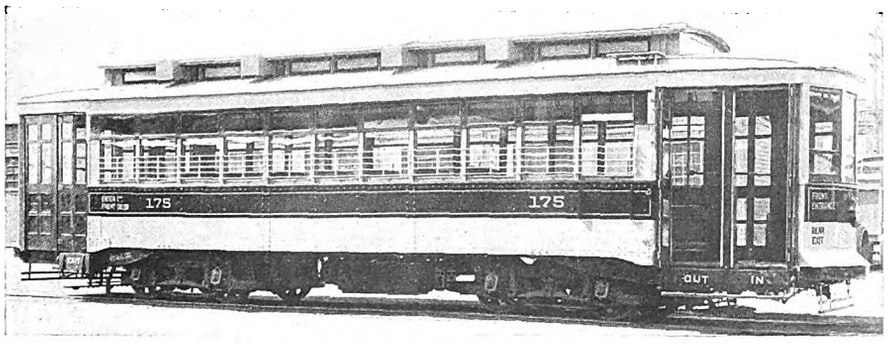
Washington Railway Receives Twelve Cars

Shipment of twelve new cars for the Washington Railway & Electric Company, Washington, D. C., has been completed by the J. G. Brill Company, Philadelphia, Pa. The cars are of the one-man, double end, city type having an over-all length of 42 ft. 3 in., weighing 40,200 lb., and seating 49 pessengers.

The bodies are of the semi-steel type with Monitor roofs. The exterior finish is cream and blue paint and the interior is cherry and grey enamel. The seats are upholstered in genuine leather. Each car is equipped with four outside-hung motors and air brakes with variable load feature. Complete specifications were published in the Jan. 21 issue of ELECTRIC RAILWAY JOURNAL.



Floor plan of the Washington cars built by the J. G. Brill Company



One of the double end, one-man cars recently delivered to the Washington Railway & Electric Company

920 Motors for London

An order recently placed by the London Underground Railways, London, England, with the General Electric Company, Ltd., has been very considerably increased and now comprises in all 920 railway motors each of 240 hp. capacity, and "automatic acceleration" control equipment for 63 motor coaches and 107 trailer cars. This is the largest single order ever placed in Britain for electric railway motors.

Ohio Railways to Improve

Several electric railways in Ohio are planning large improvements in 1928. Companies making improvements with the amount to be expended, are as follows: The Cleveland Railway, Cleveland, Ohio, $410,000; Cincinnati Street Railway, Cincinnati, Ohio, $2,500,000; Ohio Public Service Company, Cleveland, Ohio, $2,000,000; Indiana, Columbus & Eastern Traction Company, Springfield, Ohio, $75,000; Columbus, Delaware & Marion Electric Company, Marion, Ohio, $235,000; Toledo, Bowling Green & Southern Traction Company, Findlay, Ohio, $200,000, and the Stark Electric Railroad, Alliance, Ohio, $70,000.

Exhibitograph No. 7

MODERNIZATION

is the watchword for the 1928

A.E.R.A. Show

Space applications indicate an active campaign for

BETTER TOOLS
BETTER METHODS
INCREASED EFFICIENCY
IMPROVED PERFORMANCE

In previous years tool manufacturers have neglected a profitable market. Today aggressive competition is the order and manufacturers of all kinds of tools will show their products at

Cleveland next September

In less than three weeks 111 applications have been received requesting

63,444 sq.ft. of space.

New Cars and Buses for D.U.R. Reorganization

Under the plan for the reorganization of the Detroit United Railway, Detroit, Mich., ample provision will be made for working capital and financial credit to enable the new company to acquire new cars, track extensions and additional buses necessary to serve the traveling public in the greater metropolitan district. This includes the interurban rail and bus service to Toledo, Port Huron, Pontiac, Flint, Lansing and Grand Rapids, and the local railway and city bus systems of the cities of Pontiac and Flint.

Provision has been made for the purchase of 50 new modern light-weight city and interurban electric cars, and 30 additional buses and for the extension of tracks to serve the substantial growth of population in the cities of Flint and Pontiac.

A union motor-bus terminal located near Grand Circus Park in the center of Detroit has been arranged.

Roller Bearing Buys Mercer Plant

Roller Bearing Company of America, which has been engaged in Newark, N. J., since 1919 in the manufacture and sales of high-grade roller bearings, has just concluded the purchase of the large plant of the Mercer Motor Car Company, of Trenton, N. J. The company will install its present equipment in that plant and obtain a large amount of new equipment required to take care of its growing sales. The Mercer plant which the Roller Bearing Company has acquired occupies 11½ acres and the buildings have 175,000 sq.ft. of floor space. These buildings are of modern

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mill construction of one story, with daylight and sawtooth roofs. Railroad sidings serve the plant on two sides, and the property is adjacent to the main line of the Pennsylvania Railroad.

$114,000 for Pacific Electric Signals

Four extensive block-signal installations on the lines of the Pacific Electric, Los Angeles, Cal., involving a total expenditure of $114,000, are scheduled for early construction. The Sawtelle line from Vineyard to Sherman Junction, a distance of 3 miles, soon will be equipped with automatic hooded signals.

A similar installation will soon be under way between Rivas and Glendora, a distance of almost 4 miles, over a section in which manual light circuits now are employed.

On the Redondo Beach line between Hermosillo and El Nido 4 miles of track will be protected similarly at an early date, and also the Van Nuys line, near Universal City, the Tujunga Wash and Los Angeles River district, will have this type of automatic signal safeguard for a distance of 2,400 ft.

SHOPS AND BUILDINGS

PHILADELPHIA RAPID TRANSIT COMPANY, Philadelphia, Pa., will convert to a bus repair shop the building at Hunting Park Avenue and American Street. It will be a one-story brick building on a site 406x282 ft. and will contain a machine shop, overhauling shop and locker room.

NEW YORK, NEW HAVEN & HARTFORD RAILROAD, New York, N. Y., plans an electrical inspection shop on Matthews Avenue at a cost of $180,000.

PUGET SOUND POWER & LIGHT COMPANY, Seattle, Wash., will build a substation to cost $35,000.

BALTIMORE & OHIO RAILROAD will make extensions in shops at New Castle, Pa., to cost approximately $150,000.

WASHINGTON WATER POWER COMPANY, Spokane, Wash., plans a $50,000 substation to be built on South Tacoma Street.

SOUTH CAROLINA POWER COMPANY, Charleston, S. C., is planning a $75,000 addition to its recently-acquired Walterboro power plant.

TRACK AND LINE

KANSAS CITY PUBLIC SERVICE COMPANY, Kansas City, Mo., will rebuild 2,100 ft. of track to be completed within 30 days. The rebuilding is part of the $6,000,000 rehabilitation program of the company.

TERRE HAUTE, INDIANAPOLIS & EASTERN TRACTION COMPANY, Indianapolis, Ind., and the PENNSYLVANIA & EVANSVILLE RAILROAD have received the approval of the Indiana Public Service Commission to install interlocking plants at the intersection of the two lines at Terre Haute, Ind.

CHICAGO RAPID TRANSIT COMPANY, Chicago, Ill., will resume the work of relocating elevated structure columns at downtown street intersections in Chicago next month. The plans call for moving ten columns from the center of the street to the curb lines.

METAL, COAL AND MATERIAL PRICES
F. O. B. REFINERY

	May 1, 1928
Metals—New York	
Copper, electrolytic, cents per lb.	14.025
Copper wire, cents per lb.	16.00
Lead, cents per lb.	6.075
Zinc, cents per lb.	6.20
Tin, Straits, cents per lb.	51.00
Bituminous Coal, f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons.	4.075
Somerset mine run, Boston, net tons.	1.875
Pittsburgh mine run, Pittsburgh, net tons.	1.95
Franklin, Ill., screenings, Chicago, net tons	1.875
Central, Ill., screenings, Chicago, net tons	1.675
Kansas screenings, Kansas City, net tons.	2.50
Materials	
Rubber-covered wire, N. Y., No. 14, per 1,000 ft.	5.40
Weatherproof wire base, N. Y., cents per lb.	16.50
Cement, Chicago net prices, without bags.	2.05
Linseed oil (5-bbl. lots), N.Y., cents per lb.	10.60
White lead in oil (100-lb. keg), N. Y., cents per lb.	13.25
Turpentine (bbl. lots), N. Y., per gal.	$0.60

TRADE NOTES

AMERICAN ELECTRIC SWITCH CORPORATION has added to its Minerva, Ohio, factory, a new building of brick construction, two stories and basement, giving an additional 26,000 sq.ft. of floor space.

CHESTER L. GAILOR, INC., announces the removal of its offices to 50 Church Street, New York, N. Y.

C. P. POTTER, engineer for the Wagner Electric Corporation, St. Louis, Mo., was elected chairman of the St. Louis section of the A.I.E.E.

ELECTRIC SERVICE SUPPLIES COMPANY, Philadelphia, Pa., has moved its Chicago office and warehouse to 111 North Canal Street, directly opposite the Chicago & Northwestern Depot.

WILLIAM E. KEMP has been appointed district sales manager, with headquarters in the General Motors Building, Detroit, Mich., for the Kingston Products Corporation, this being a consolidation of Byrne, Kingston & Company, Kokomo Electric Company, and Kokomo Brass Works. Mr. Kemp has been with these companies for the last eighteen years as manager, first at Chicago, and more recently at the New York and New England branches.

WAGNER ELECTRIC CORPORATION announces the removal of its New York City branch sales office from 50 Church Street to 30 Church Street. The New York City service station remains at 321 West 54th Street.

HEADLEY GOOD ROADS COMPANY, Philadelphia, Pa., has appointed as manager of its research and development department, Edgar S. Ross, formerly with the Mellon Institute of Industrial Research, Pittsburgh, Pa.

COLUMBUS MCKINNON CHAIN COMPANY, Tonawanda, N. Y., has acquired control of the hoist division of the Chisholm Moore Manufacturing Company, Cleveland, Ohio. The general sales offices and factory will continue to operate in the same location, under the same name and personnel as in the past.

GUNITE CORPORATION, Rockford, Ill., has been incorporated to manufacture and market the product Gunite, a gun-iron alloy which has heretofore been made in the Gunite division of the Rockford Malleable Iron Works. Duncan P. Forbes is president, and John A. Forbes secretary and treasurer, of the new corporation.

W. R. VOORHEES & COMPANY, San Francisco, Cal., and Seattle, Wash., is now representing the Billings & Spencer Company, Hartford, Conn., in Montana, Colorado, Wyoming, Idaho, Utah, Nevada, Washington, Oregon, California, Arizona, New Mexico and El Paso, Texas.

ADVERTISING LITERATURE

CROUSE-HINDS COMPANY, Syracuse, N. Y., has recently issued an illustrated bulletin entitled "Airport Lighting Equipment."

OHIO BRASS COMPANY, Mansfield, Ohio, has issued a bulletin describing O-B cross wire and wire lock clamps.

COPPERWELD STEEL COMPANY, Glassport, Pa., has issued a bulletin descriptive of Copperweld ground rods.

ELECTRIC STORAGE BATTERY COMPANY, Philadelphia, Pa., has issued a booklet entitled "An Unusual Locomotive." It describes the 128-ton combination storage battery-oil-electric locomotive built for the New York Central Railroad.

ELECTRIC SERVICE SUPPLIES COMPANY, Philadelphia, Pa., has issued a new folder, No. 253, on Keystone portable lamp guards.

CROUSE-HINDS COMPANY has issued catalog No. 310 on floodlights and industrial lighting units.

INGERSOLL-RAND COMPANY, New York, N. Y., announces publication of a 44-page bulletin on ER and FR compressors and vacuum pumps. These are the small and intermediate size machines produced by the company.

ALEXANDER BROTHERS, Philadelphia, Pa., have issued a new booklet describing in detail the construction, horsepower capacity, and drive design data of Tentacular transmission belting.

IRVING IRON WORKS COMPANY, Long Island City, N. Y., has issued Bulletin K, descriptive of Irving continuous floor armoring.

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Prepare for More Fares

There is no myth about the economic advantages of Brill Modern Cars, for with them, electric railway companies have won public approval and avoided the excessive operating costs of heavy equipment.

Consider the four light weight interurban type cars built by the American Car Company for the Missouri Pacific System. These cars operate between Houston and Goose Creek, Texas. They are attracting passengers because of the care given to the details which contribute to comfort, convenience and improved appearance.

Increased public patronage and greater net profits can be obtained. Plan ahead with Brill Modern Cars.

THE J. G. BRILL COMPANY
PHILADELPHIA, PA.
AMERICAN CAR CO. ST. LOUIS MO. — G. C. KUHLMAN CAR CO. CLEVELAND, OHIO. — WASON MANF'G CO SPRINGFIELD, MASS.

Brill Light Weight Interurban Cars

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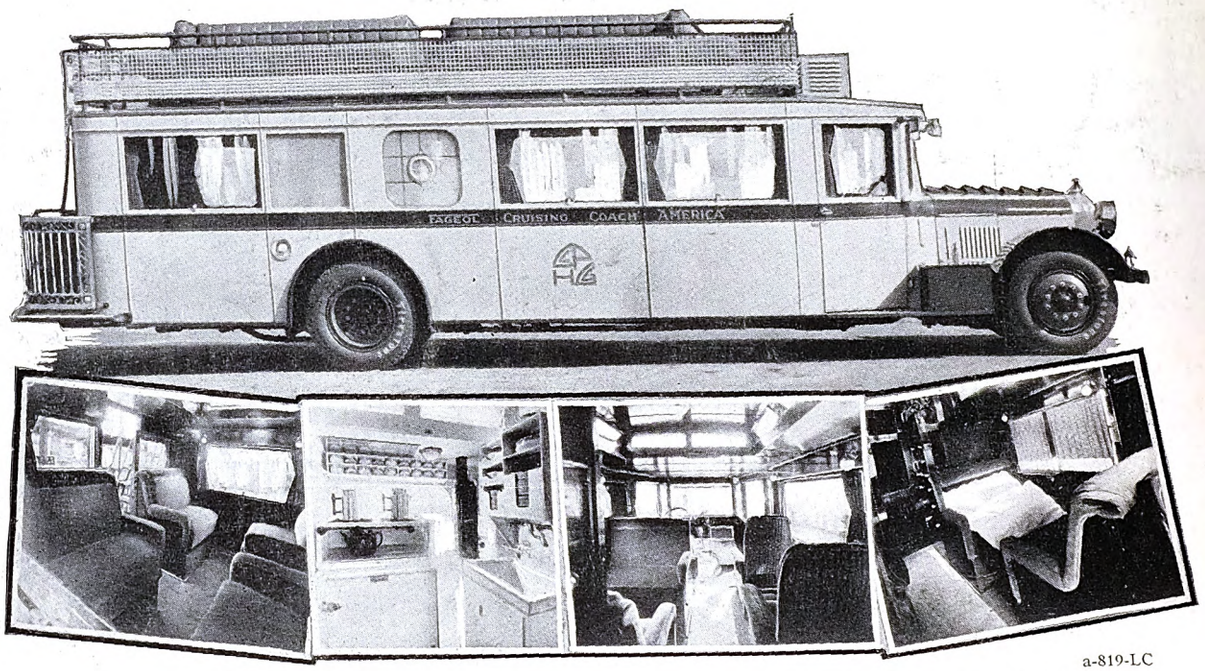

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Waukesha-powered Fageol Coach "America"—a Pullman of the Open Road

A "Ritz" on wheels

Accompanying C. C. Pyle's Transcontinental Foot Race and affording complete living accommodations is this Fageol cruising coach "America." As with other land cruisers—the famous Linn Six-Wheeler, the Dan W. Smith Twin Coach, "Michigan," The Metro-Goldwyn globe-girdling trackless train—comfort was the first consideration. Naturally the silky-smooth, vibrationless Waukesha "Ricardo Head" big bus six was picked for "America."

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ELECTRIC RAILWAY JOURNAL

McGraw-Hill Publishing Company, Inc. MAY 12, 1928 Twenty Cents Per Copy

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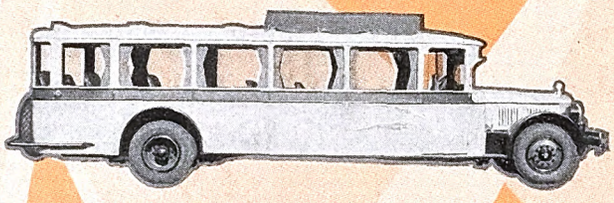

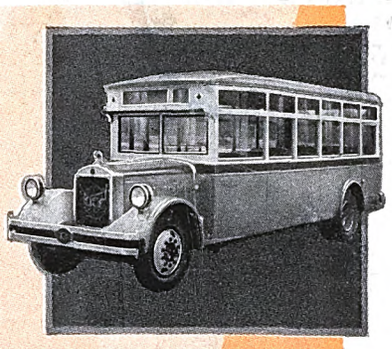

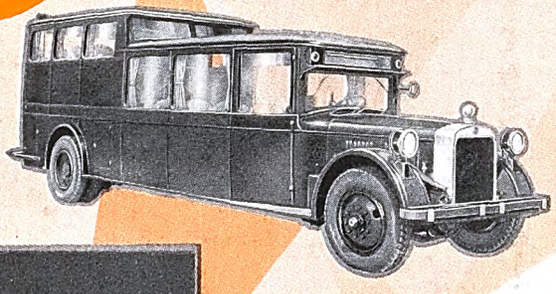

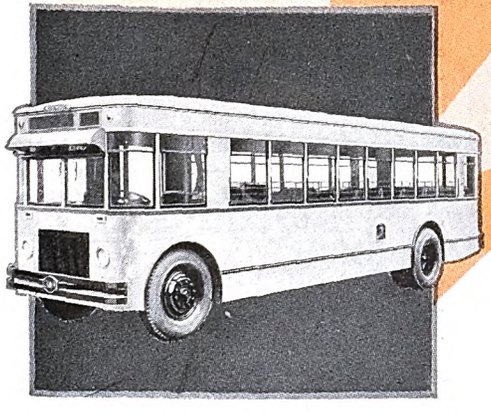

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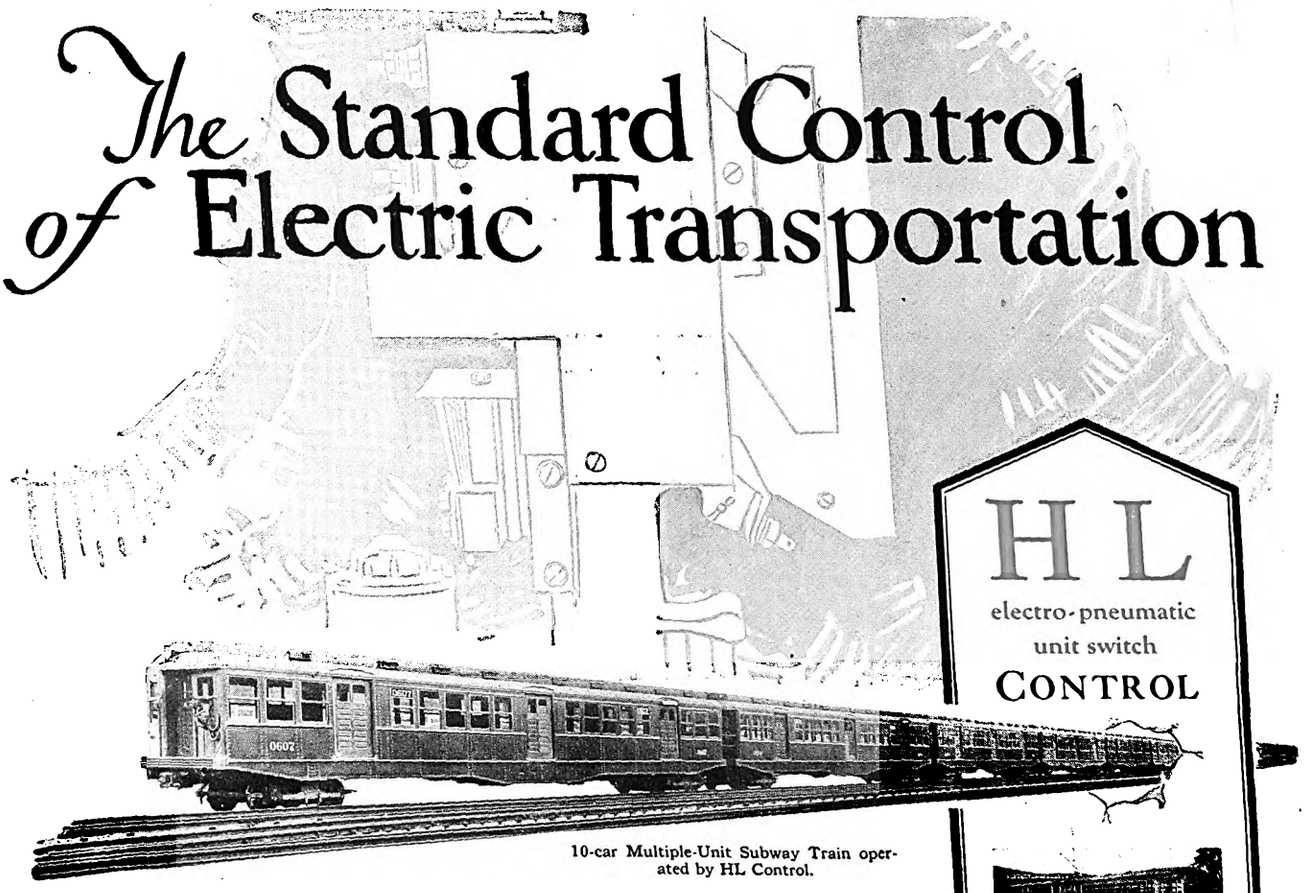
The Standard Control of Electric Transportation



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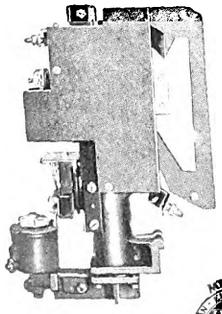

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Electric Railway Journal

McGraw-Hill Publishing Co., Inc.
JAMES H. MCGRAW, *President*

Consolidation of
Street Railway Journal and
Electric Railway Review

CHARLES GORDON
Editor

Volume 71 — New York, Saturday, May 12, 1928 — *Number* 19

Tactics of the Ostrich Condemned by President Stevens

PRESIDENT STEVENS of the American Electric Railway Association strikes at the heart of the question, "What about the future of electric railways?" in an address made before the Southwestern Public Service Association at its Dallas meeting, and published elsewhere in this issue. All other questions regarding railways are secondary to this. The problems of financing, of modernization, of public relations, and the whole matter of management policy, are contingent upon satisfactory assurance that electric railway transportation is not to be supplanted.

There must, of course, be some form of speedy and convenient transportation in modern communities. Otherwise the conduct of ordinary business would be impossible. There are only two alternatives; there must be either a responsible public transportation agency or the streets must be abandoned to individual vehicles. Obviously it is physically and economically impossible for each traveller to "roll his own," despite the predictions of some automobile manufacturers with more enthusiasm than knowledge of transportation matters. The vast majority of people cannot afford to spend so large a part of their income merely to get about in their daily travel. Furthermore, no city can afford to provide the street space needed, even if the public were able to buy and operate enough automobiles. The whole proposition is so ridiculous that no one who even pretended to recognize the facts would seriously entertain it for a moment.

Since there is a continuing, and in fact an increasing, need for public transportation, there still remains the question of whether this will be provided by buses or by electric cars. Each vehicle has its advantages and disadvantages. The bus has flexibility and low investment cost in its favor. The car has long life, lower operating cost, high carrying capacity and service reliability. The so-called "rubber urge" as a factor in transportation has been proved an invention of the fancy. Unless the bus offers something more than merely rubber tires, it has no greater appeal to the public than has the street car. As has been reiterated time after time in these columns, the bus has an important place in public transportation, but that is in providing preferred forms of service at higher fare levels and not in the duplication or replacement of street car service.

Many railway managements are putting buses in place of street cars because of one primary consideration —the lower investment involved in the purchase of buses than in the rebuilding of track. In some instances of low traffic density this point of view is justified. But in many others the real explanation for the reluctance to spend money in rail rehabilitation and the replacement of obsolete cars lies in the lack of confidence on the part of the railway managements themselves regarding the future of street railways.

President Stevens calls upon the industry to look facts in the face. True, electric railway riding has been decreasing. But what have the railways done to change this condition? Are they meeting modern transportation standards? Modernization is imperative if the decline in passengers is to be checked. There is at present a vicious circle. Failure to provide up-to-date service results in falling patronage, and that in turn causes railway managers to question the future of their own business.

The public of today demands more than mere utility. Beauty has become an important factor in the lives of the American people. A street car that merely runs is no longer satisfactory, even though the fare is low and the service regular. The esthetic factors of appearance, appointments and comfort and the practical one of absence of noise are as important to attract patronage as are the utilitarian factors of reliability and economy. Frequency of service is all-important, and President Stevens rightly points out that the field is still wide open for the car manufacturer who will provide a really attractive and easy riding four-wheel car seating approximately 40 passengers.

A Clearing House of Business Philosophy

THAT the United States Chamber of Commerce is one of the country's great organizations for the promotion of constructive thought and action, not only within business itself, but in the relations between business and the general public, was apparent at the annual meeting held in Washington during this past week. To public utility men, schooled in the philosophy of public service, the declaration by leaders in general business of a similar doctrine of public accountability is indeed significant.

This new note in general business thinking was perhaps sounded most clearly by Judge Edwin B. Parker, chairman of the board of directors of the National Chamber, in an address at the close of the general session on Tuesday morning. Business has a responsibility above that of making a profit, according to Judge Parker. The method of the making is of importance not only to the general public but to business itself. Continued growth and development of business are dependent on the retention of its good name, and the road to avoiding restrictive public interference is through self-regulation. "The profession of business" is an expression used repeatedly by Judge Parker, which characterizes this new-day recognition of the importance of a professional code in trade and industry.

Utility men will find little difficulty in indorsing heartily this kind of thinking. Recognition of public accountability came to transportation men, particularly, out of the hard school of experience. How significant is it, therefore, that general business today voices its recognition of a similar responsibility to the public and that its spokesmen warn against the perils of a "public-

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be-damned" attitude and advocate that business men and business associations condemn and cast out of their ranks those who put expediency and immediate profit ahead of fair dealing and a good name.

In the specific work of the Transportation and Communications Section there is much of direct interest to local transportation men. Under the able leadership of A. L. Humphrey a great public service is being performed. It is a credit to the vision of the local transportation industry that the American Electric Railway Association executive committee held its meeting in Washington during this past week, and that many railway executives from properties throughout the country attended and participated in the sessions of the National Chamber. Not only this national work, but also the acivities of local chambers of commerce are deserving of active interest and participation by local transportation companies. "Teamwork in Business" was indeed a happy theme for this year's national meeting. It is exactly through that means—teamwork between electric railways and local business men—that the pressing problems of local transportation will be solved.

An Affiliation That Will Mean Much for the Industry

COMBINATION of the Stevens & Wood-Hodenpyl-Hardy interests in the Allied Power & Light Company, with R. P. Stevens as its president, has followed closely upon the recently announced merger of the Northern Ohio and Penn-Ohio systems. The financial details are still in the formative stage, but the facts so far made public indicate the extent of the holdings of the new company. These are recapitulated elsewhere in this issue. The magnitude of the railway properties is imposing. The achievements of Mr. Cobb, chairman of the Advisory Council of the A.E.R.A., in transportation are well known, just as are the achievements of Mr. Stevens, now president of the American Electric Railway Association, and Mr. Sawyer, president of the association last year, now president of Stevens & Wood. The Grand Rapids Railway, included in the Hodenpyl-Hardy group of properties, was last year's Coffin Prize winner, and the Penn-Ohio system, under the direction of Stevens & Wood, was the Coffin Prize winner of 1926. These roads, by their very capture of the Coffin Award, are properties which on their own account stood out at the top in many things well done in a competition that has been unusually keen. Moreover, as a phase of their activity, particularly in the case of the Penn-Ohio company, the place of the bus in city, suburban and interurban service has been most definitely fixed. It so happens that a speech about the electric railways made by Mr. Stevens before the Southwestern Association appears elsewhere in this issue. That, of course, is a mere coincidence, but it does serve to make plain, as reiterated in other editorial comment, the progressive and militant attitude of the directing head of the new Allied Power & Light Company toward the electric railways. Since the interests now brought together have been in the forefront of those who have striven intelligently and to good purpose in the past with the electric railways included in the systems with which they have been identified, it is certain that the new affiliation will mean much for the industry as a whole.

Alongside of the Model T in the Ford Museum at Dearborn

NO LESS primitive than his model T is the street car so graciously presented by President Porter of the Brooklyn City Railroad to Henry Ford. It will be placed in the Ford Museum in Dearborn. If a car ever has qualms then this one must have sensed its supersession when Van Depoele, the trolley pioneer, installed his line on Jamaica Avenue, Brooklyn, back in the eighties. The car is redolent of the period just after the Civil War, of carpet bags and bombazine. Since it made its first run in 1868 and its last in 1897, it would be interesting to know how it accredited itself during the blizzard of March 12, 1888, the token by which all storms in New York have since been measured. Many persons remember the car's immediate successors even if they do not remember the car itself or its counterparts, which came into general use soon after the first Brooklyn line was established.

The Brooklyn car was in service long before Deacon Richardson had begun to function as president of the Atlantic Avenue Railroad in Brooklyn. And those who think that customer ownership is something new may mark well that stock of the Brooklyn City Railroad of $10 par was sold from door to door and is still of that par value. During the 75 years since the car was first run the Brooklyn City Railroad has never been in receivership or been reorganized. That is another record in street railway, railroad or general corporation finance. The car that now goes to Dearborn was a model in its day, just as are the cars in use on the Brooklyn City Railroad lines at present. It well deserves the place it has attained at Dearborn. It is not so ancient, but it is an antique and a relic.

Are We Treating the Employment Question Scientifically?

MOST American electric railway companies report a much lower labor turnover than formerly. At one time, an electric railway job was looked on by many employees as a sort of stop-gap, to be held until something better was available. With automatic equipment which reduces the physical labor of car operation and with the more congested streets of the present time which call for greater mental alertness, men of higher grade are seeking transportation employment. Comparatively high wages, group insurance paid for by the company, other benefits which add to the wages actually paid, together with reasonable guarantee of continuous employment—all are inducements which attract these men and keep them satisfied with their jobs.

With this difference in labor conditions, the present is a good time for railways to consider whether they are exercising as much care as they might to engage men who are especially adapted to electric railway work. When the labor turnover was high and only ordinary intelligence was needed on the car platform, no great precautions were necessary in this respect. With the time and money now spent by the average company to train a man as platform operator, a different condition prevails. If he later proves unable to perform the duties of his position, the time and money spent in this training are lost. It is almost, if not quite, as important to the applicant himself to be rejected early rather than after

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spending a month or more trying to learn how to do something for which he is naturally unfitted.

The use of psychological tests of applicants for employment is the logical answer to this problem. Up to the time of the war, when tests of this kind were given to Army recruits, their value here was hardly understood. Even now, only few companies have psychological tests applied by their employment departments. European electric railway companies have done much more in this direction, and their efforts have brought prompt monetary return. Not only is there an increase in the proportion of men who remain permanently in service from among those accepted, but there has been a noticeable decrease in accidents and economies in other directions. As explained in an article in last week's issue, the tests have been applied to conductors and shop men, as well as to motormen.

Few companies do their purchasing of materials except by specification, checked by test, but many do not consider it necessary to adopt scientific methods in selecting employees. A casual talk and the "once over" by the employment agent are considered all that is necessary for applicants who pass the medical examination and have sufficient education to fill out an application blank. But there is nothing so deceptive as the idea that a man's qualifications for a particular job can be told from his appearance alone. Companies which have applied psychological principles to the selection of new employees report themselves satisfied that the method pays. This being so, it should be worth careful consideration.

Platitudes Put in Practice Pay Profits

SO MANY things contained in the report of the Cincinnati, Hamilton & Dayton Railway for 1927 deserve commendation that it is necessary to proceed cautiously lest comment become a mere reiteration of the contents of the report. It was the first full year of operation of the rehabilitated road. Business was bad in the Miami Valley last year, just how bad the report makes plain. Despite this, the passenger revenues of the interurban line in 1927 were 2.1 per cent in excess of those of the preceding year, while the total tons of freight handled were 26.2 per cent in excess of the 1926 tonnage, and freight revenues 23.2 per cent greater in 1927 than in 1926. Even the Dayton city lines responded to improved equipment with an increase in patronage. Costs per car-mile were cut, a saving was made in the bill for power, and maintenance expense was reduced.

These economies were incidental, however, to the larger program of intensive development. The record made was achieved by a dynamic attitude that appraised at its full worth the results likely to follow the provision of more frequent, comfortable, attractive and rapid service, by selling the service to the car rider and freight shipper through modern methods of publicity and solicitation and the development of new types of service to meet changed economic conditions. Reduced thus to their simplest terms, these sound like platitudes. Many people will dismiss them as such, because the imagination is lacking to translate them into boxes of freight, crowds attending a fair, theater parties and the mass of people at all times susceptible to exceptional service sold intensively. It is not to be expected that the achievements of the road in 1927 can be made cumulative, but it remains a fact that the Cincinnati, Hamilton & Dayton Railway was not converted from a decrepit, obsolete broken-down property to one of the most modern of its kind in the country by the practice of legerdemain. That result was achieved by vision that correctly appraised the possibilities, followed by an immense amount of hard work and constant vigilance.

Make It Easy for the Passenger to Pay

NOT always have we had a buyer's market for local transportation service, such as exists today. Years ago it was a seller's market. Then people had no automobiles of their own and the public transportation agencies had a virtual monopoly. But those days are gone forever. Nowadays we must make it as easy as possible for the customer to buy our wares. One of the most important factors in successful merchandising is to make it easy for the customer to pay for his purchase. Merchants sometimes do this through encouraging buying by partial-payment plans and charge accounts. Obviously, these ideas are impracticable in selling transportation service. But every operating company can and should use a system of fares and fare collection that makes payment simple and easy for the passenger.

With the practical disappearance of the nickel as a unit of fare the situation has become worse. Although more than 200 cities now have a 10-cent cash fare, in all but seven of them there is also a reduced-rate ticket or token fare used by the great majority of passengers. Since the fare itself cannot be adjusted merely to facilitate payment, the transportation agencies must take advantage of every possible means of making it easy to pay the rate which has been fixed.

No general rule can be laid down concerning the best way to do this. Use of tickets or tokens, however, is undoubtedly easier than payment by cash when the latter involves several coins. When tickets or tokens are used, nothing should be left undone to make it easy for the passengers to buy them. A large railway which formerly sold four tokens for 30 cents but refused to sell two for 15 cents, furnishes a shining example of what not to do.

Real salesmanship does not place on the passenger the responsibility for having the correct fare, but rather tries energetically to help him to have it. In regard to methods of fare payment, the electric railways in this country can profit by the example of those abroad. In Europe, where zone fares are the rule, the problem is exceedingly complex as compared with that in the United States. Nevertheless the operating companies have gone far to overcome the handicap by developing methods of change-making, ticket-issuing and fare collection. These have been worked out so well that the exacting requirements are met without confusion or delay. Among the interesting developments of this kind are the automatic change-making and ticket-selling machines used in London, recently described in this paper. With certain modifications similar devices would undoubtedly prove useful on electric railways in the United States using stations or prepayment areas. Making change is a requirement on all systems, and selling tickets or tokens on many of them. Whatever can be done to facilitate or expedite the process will improve the service and please the patrons.

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The Future of Electric Railways Is No Longer in Question

By R. P. Stevens
President American Electric Railway Association

PRESIDENT STEVENS here throws aside details and strikes at the fundamental question of the future of the electric railway industry. His views, presented at the recent meeting of the Southwestern Public Service Association in Dallas, Tex., express confidence in the industry's outlook. He holds that the outstanding problem of public transportation companies is that of keeping abreast of the times.

IT SEEMS to me that no matter how many of the details of our business we discuss, there is one major question before us. It is in the minds of the men in the shops and on the cars; in the minds of the executives administering the companies' affairs; in the minds of those to whom we must turn for financing; and, to a lesser degree, in the minds of the car riders. The question is: *"What is the future of the street railways?"*

Are we what we have so vigorously proclaimed ourselves to be, an essential, vital, absolutely necessary and therefore a permanent, continuing industry? Or are we emulating the ostrich in its foolish habit of burying its head in the sand, and shutting off from our vision inevitable and unescapable facts bearing down upon us with overwhelming force? It is an important question, not only to us, but to the public.

First, why does the question arise? The answer to this is simple—it arises because some 20,000,000 private automobiles are being operated in the United States and because there will be an increase in this number for at least several years. These private automobiles have taken a considerable part of the traffic which otherwise would have been carried in street cars. The question of the future of electric railways is also kept before us by the heated argument going on within our ranks between the old stand-patters and the bus-acclaiming element. This is unfortunate—it reminds me of a young boy, who, hearing two cats in a terrible rumpus in the back yard, said to his father, "I guess those cats are tearing each other to pieces." "No, son," replied his father, "they're just getting better acquainted." So with the bus controversy. It has cost us millions of dollars to learn—and that only recently—the economic limitations as well as the advantages of the bus in handling public transportation business.

The question arises also because of the occasional abandonments of small street railway systems that never had any economic justification. For example, not long ago it was heralded all over the United States that "the last street railway company in Nevada" had ceased operating. The public could not be expected to know that there never had been more than one street railway in Nevada, and that that company never operated more than 7½ miles of track or had more than six cars. Yet that inconsequential abandonment inspired many comments in the public press that added to the public's uncertainty as to the permanence of our industry. A large section of the public has acquired the notion that the street car has outlived its usefulness. There is a very difficult psychological problem to be met, but it is being met, and in due time the erroneous ideas which have gained currency will be eradicated and supplanted by the only thing that can supplant them—the truth. There has been too much jumping at conclusions with respect to the electric railway situation, and not enough analysis of the facts.

I remember a friend of mine who once said "My wife is a great athlete—in fact, she holds the world's record for jumping at conclusions." So with many of those who would relegate electric railways to the scrap heap. Let us survey the situation. Most of you attended the A.E.R.A. convention in Cleveland last October. You saw the largest exhibit of rolling stock ever displayed at an electric railway gathering. You saw new types of cars, new kinds of trucks, new kinds of seats, new designs, new methods of maintenance of equipment and tracks. You saw new types of buses, too, and many of you joined in singing what might be called the chorus of the convention—"The bus men are making the buses look like street cars and the street car men are making the cars look like buses."

And that is more or less true. The electric railway engineer has taken ideas from the automotive engineer, and the bus man has profited by the experience of the electric railway engineer. That the bus manufacturer is adopting ideas from the street car is not surprising to experienced electric railway operators. Nor is it difficult to understand why the car builder is making his vehicle look more like a bus. The reason is largely psychological. The automotive vehicle is new; it is sleek and speedy looking; it impresses the public as being "modern," while the street car has been a more or less standardized vehicle making no appeal to the unvoiced, but none the less real, desire of the public for "class" and "up-to-dateness" in public transportation as well as in clothing, home environment and entertainment. There are evidences every day of a great influence which beauty is exerting upon American industry and business, and in the lives of the

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American people. We see this every day and must meet it as any other business man would. A shrewd merchant carries the goods his customers want. Our customers, the present-day Americans, want beauty in their transportation vehicles as well as in their homes and home furnishings.

Why do people turn in automobiles a year old for new ones with more artistic lines? Why are the symphonies and classical music becoming more popular every year? Why did Henry Ford spend a huge fortune in making "Lizzy" look more artistic, and why do they pay the General Motors designer more than they do the President? The growing influence of the appeal of beauty, as the artist knows it, is on every hand. One characteristic of the American people is that they want to skate in summer and swim in winter. They want something different—and they want it now. Let's give them what they want in transportation.

Hence the new designs of street cars, while incorporating electrical and mechanical innovations to give more efficient performance, also tend toward greater beauty of lines and appointments—toward more "class." It is the public's verdict. Not only must we have efficient vehicles, but we must make them look up to date. We are in the bobbed-hair, silk-stocking, short-skirt era. It will not do to continue offering the public street cars that remind it of bustles and dragging skirts, with shot sewn in the hems lest a vagrant breeze expose a cotton stocking and a petticoat. These things smack of antiquity, and the public refuses to be old-fashioned.

Keeping in Style

It may be true that the old cars and the old garments were sturdy, substantial, serviceable goods, but that does not dispel the fact that they are reminiscent of pre-flapper days. Being out of style, the public considers them as no longer useful. It will do us no good to regret this fact; we have to deal with conditions as we find them —not as we might like to have them. Therefore we are trying to build modern-*looking* cars, as well as cars equipped with modern mechanical devices that improve service. None of us wants to go back to the skin and bones type of single-truck safety car; but there is an opportunity for the car builder to develop a small car that can be as luxurious as the big fellows and that can be operated on a "car-in-sight" basis.

Where are we heading in buses? In January, 1921, sixteen electric railways were operating 23 buses on 35 miles of route. By October, 1927, *Aera* reported that 367 electric railways were operating 8,350 motor buses on 16,722 miles of route. During all these years of phenomenal expansion, the great majority of electric railways operating buses have reported that the bus routes failed to make money. The expansion of a losing business is rather paradoxical, but it can be explained on several grounds—some valid, some invalid. The most valid ground for these extensions is that many of them are "stop-loss" or, more accurately, "less-loss" operations. They were made to avoid the high capital investment and charges for new foundations, track and paving in districts with little present or prospective business. There are also many installations that were made because of the fear of competition. Such installations are regrettable because they suggest that the public was not properly informed as to the facts of transportation service.

Some bus installations resulted from a strong sense of obligation. It seemed so natural to run a route through this or that suburban area; and so easy to do it. Unfortunately, however, it costs quite an "out of pocket" charge just to keep the buses going. Once started, they become part of an established city-wide transportation system and therefore cannot be withdrawn with the easy grace shown by the independent operator who was frequently responsible for creating the public demand for bus service.

"Rubber Urge" Has Proved Nonsense

The truth is that the industry was overwhelmed for a time by the so-called "rubber urge." Steel wheels, we were told, were out of date. The pleasure of the personal car was confused with the service that would be rendered by a public utility vehicle—the bus—running on rubber tires. Bus salesmen first made themselves believe, and then they made the bus buyer believe, that automobile owners who had deserted the trolley car would be drawn back by the bus. This has proved sheer nonsense. Ten minutes are ten minutes, whether one is waiting for a trolley car or for a motor bus; and if you don't want to wait ten minutes, you ride on neither. The present bus situation is not economically sound—it cannot endure —it will be sifted until the bus finds its proper level, and that is not, except in small measure, in the class of service offered by the street car. Think, for instance, of the many places in the country where the street railways—that don't use the pavement—pay for the cost of the paving, and the buses—that do use it—pay no such proportionate cost. Many of those who predict that buses are destined to replace street cars, overlook this ridculous situation. Is it reasonable to believe that the public would remain blind to the facts if buses were to replace cars on any such scale as has been predicted by some enthusiasts?

One case is especially ironical—where they do make a pavement charge for buses. The irony of it is that those buses are operated by the street railway company. I have in mind the city of Baltimore, Md., where the company is paving for the cost of the paving three times: first, by bearing its proportion of the city taxes; second, by paying the cost of maintaining the paving; and, third, the paying tax of the bus. Can this situation continue? Why, of course not—and, as this unreasonable state of affairs becomes adjusted, the bus may be expected to assume its proper place as a high-fare, preferred type of service vehicle and not as a mass transportation agency.

That not all bus men have come to a realization of the full responsibilities of a public transportation purveyor is revealed by the recent remarks of one leader in that field. He criticized adversely the policy of running a bus route throughout the day when only two or four trips a day were self-supporting. Independent operators did not do things that way; that was why they prospered. It is quite true that the electric railway men's concept of transportation service is to keep something on the move all day long. One trip in the morning and one trip at night does not meet the responsibility of a mass transportation system.

The public expects steady service from the organization that it associates with steady service. Not many electric railways would be permitted to operate on the "now and then" basis maintained by the independent bus man who takes his bus home to lunch with him and snatches a nap on the parlor sofa until it is time to make another profitable run.

By this time we know that the public is more interested in frequency and speed than in whether it rides in a car or bus. If we profit from our own experience and

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that of others, we will be able to turn many a present bus loss into a bus profit through nothing more startling than the use of smaller buses at proper rates of fares.

We are taking a saner, more realistic view of the bus question. We have stopped deluding ourselves about a mystic rubber urge, but are figuring closely what business we are likely to get and how much service we can give with the most economical vehicle. The bus no longer represents a serious problem. It has been adequately demonstrated that it must be intelligently coordinated with existing transportation agencies.

The private automobile constitutes our most serious problem, but the very number of automobiles that attempt to use the streets is forcing a more intelligent allotment of street space. Our large cities are abolishing parking in the congested districts. The use of the public streets for all-day storage of private vehicles cannot be permitted forever in any of our cities. For one thing, it is too costly—street space is worth $10,000 a square foot in some of our cities. For another, it prevents the streets from serving their purpose, that is, from being avenues for the movement of traffic. For still another, medical authorities are beginning to express concern about the contamination of the atmosphere in city streets by the exhaust of innumerable automobiles.

Street congestion is causing the public to turn again to the street car. Witness the situation in Cincinnati, for instance, where street car traffic increased 7,500,000 passengers in 1927 as compared to 1926. Witness conditions in almost any medium-size city, where the newspapers a few years ago were declaring that the day of the street car was gone, but where they now are objecting to the discontinuance or curtailment of street car service and are declaring, quite properly, that the services rendered by the electric railways are necessary, essential, indispensable.

There is still another important indication that the private automobile has about reached its maximum as a destroyer of electric railway traffic, and that is the fact that the manufacturers admit that most of the vehicles they sell are for replacement of worn-out cars. Such a condition indicates the approach of the saturation point, which in the past was regarded as mythical. Another straw pointing the way of the wind is the price cutting which is going on in the private car industry. Price cutting means just one thing—that sales resistance is increasing, and it is increasing, in the opinion of many students of current conditions, chiefly because nearly everybody who can afford an automobile already has one.

So it seems to me there is good ground for optimism in this electric railway industry of ours. There is no ground for self-complacency, for unwise over-confidence, however. The automobile has taught the public that it is possible to move swiftly, comfortably and conveniently, and a public accustomed to that kind of transportation will not desert it for something less convenient and less attractive. That is why the whole electric railway industry today is concentrating on modernization, not only modernization of equipment but also of attitude of mind toward the service.

There is a very definite and pronounced favorable trend on the part of the public toward electric railway transportation, but in all too many communities there is still the lack of realization that to grow and prosper every community must have public mass transportation facilities. It is up to us to bring this fact home to the people. It is our fault if they do not know it. I believe more effort should be made to bring home to communities an adequate realization of the predicament they would be in if they were deprived of electric railway transportation, as some surely will be unless authorities co-operate more fully. We can expect this co-operation only when it is backed by the people of the community.

I make this statement advisedly. Its truth has been taught by that sternest of teachers, experience. Phoenix, Ariz., with 26,000 people, found that electric railway transportation could not be dispensed with. The city, itself, was obliged to furnish it. Look at Ashtabula, Ohio; at Athol, Mass., with only 10,000 people; at Greenfield in the same state, with only 15,500; and a great many others. There are many instances of cities, not only of medium size but small cities as well, that after trying to get along without street railway transportation found themselves compelled to provide these facilities at the city's expense and at a cost invariably greater than under private operation.

The trend toward higher fares has been definite, but this is only one of the many ways communities can co-operate to provide better transportation facilities. I refer to such measures as relief from indirect taxes on the car riders and unnecessary service requirements founded upon custom and practices of the past, which have no reason for existence now, if they ever had.

Not the least of the handicaps that the cities can remove are traffic rules which hinder electric car operation and cut down speed. Refusal or failure of city authorities to help provide faster schedules is a short-sighted policy most frequently encountered today, especially in the smaller and medium-sized cities. In congestion, a street car goes as fast as the traffic—that is all that the automobile can do—so why permit the automobile, carrying an average of 1.8 passengers, to slow down street traffic and cars carrying 50 or more passengers?

Much more could be said to prove that mass transportation will continue to be handled by the electric railways until some other form of transportation not now known is invented to take its place. Our problem is to keep abreast of the times. We have the brains, the will, the energy and the desire to keep our industry abreast of the exacting requirements of the public, and to do so at a profit. Let's go.

Our Problem

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—R. P. STEVENS.

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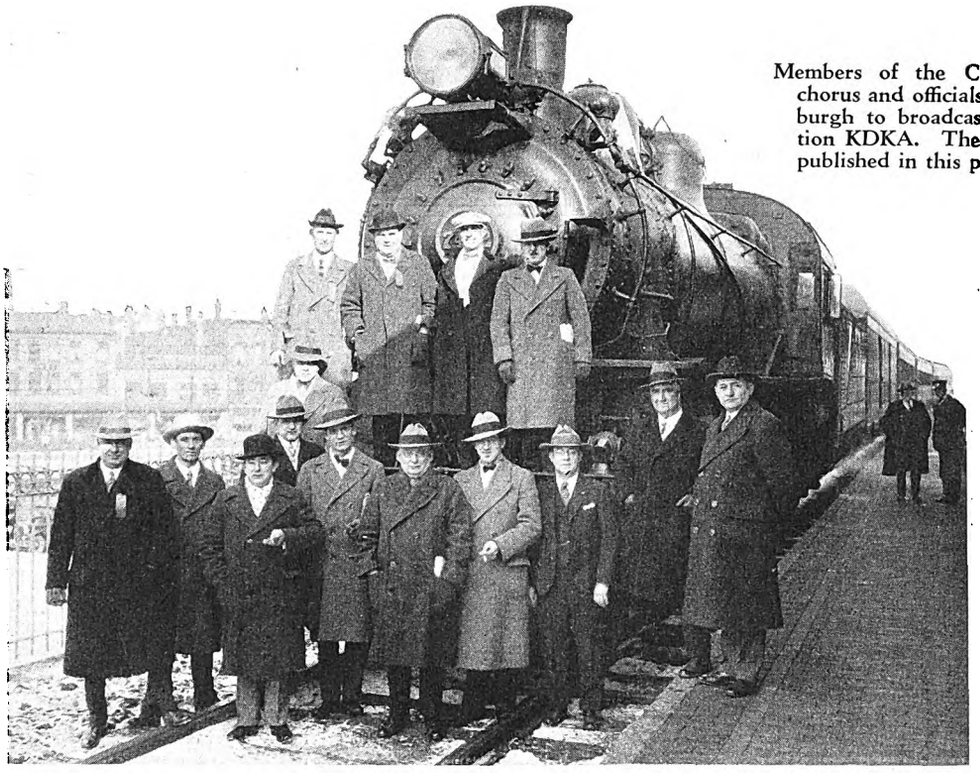

Members of the Cleveland Railway chorus and officials en route to Pittsburgh to broadcast from radio station KDKA. The news of this was published in this paper for April 14

Cleveland Personnel Department Organized to

Improve Employee Morale

Welfare, accident prevention and employment divisions of department are working toward merchandising of transportation through better trained employees. New retirement and benefit insurance plans reduce labor turnover

WITH the organization of a complete personnel department on July 1, 1927, the Cleveland Railway has carried forward its policy of perfecting its own organization in the interest of better public relations. This move was made at the same time a retirement and benefit insurance plan was announced to the employees of the company. It is believed that the closer contact between the management and the great body of its employees, through which the men in the ranks may be given a clear understanding of all the policies and ideals of the company, will in great measure bring improvement of public relations, success in safety work and general efficiency in conducting the affairs of the road.

The organization chart on page 768 indicates that all the activities of the personnel department bear a close relationship to one another and that employee relations and public relations are considered inseparable. Improvement of public relations through contact with employees is divided into two phases: (1) Giving the employee complete understanding of his task; (2) creation of company prestige as a background for the work of all employees.

A "contact club" has been organized and a code of regulations prepared. Those employees who are entitled to membership in a "25-year service club" have been listed. Several general office employees are attending a training course conducted by the Cleveland Recreational Council in order to receive instruction in the management of social games and activities. The organization of athletic teams at various division headquarters is being encouraged, and athletic equipment is provided at cost wherever possible. A chorus has been formed and is rehearsing an oratorio which will be sung publicly in the Cleveland Masonic Auditorium on May 31. An orchestra has been organized in the motor coach department and already has contributed to programs of social gatherings of the different divisions.

The Cleveland Railway is spending about 4 per cent of its payroll to provide a pension accrual for its employees. The company's employees have available now not only the recently adopted retirement and benefit plan which, for brevity, is referred to as the Metropolitan plan, but also receive the benefit of group life insurance placed with the Travelers' Insurance Company. Since

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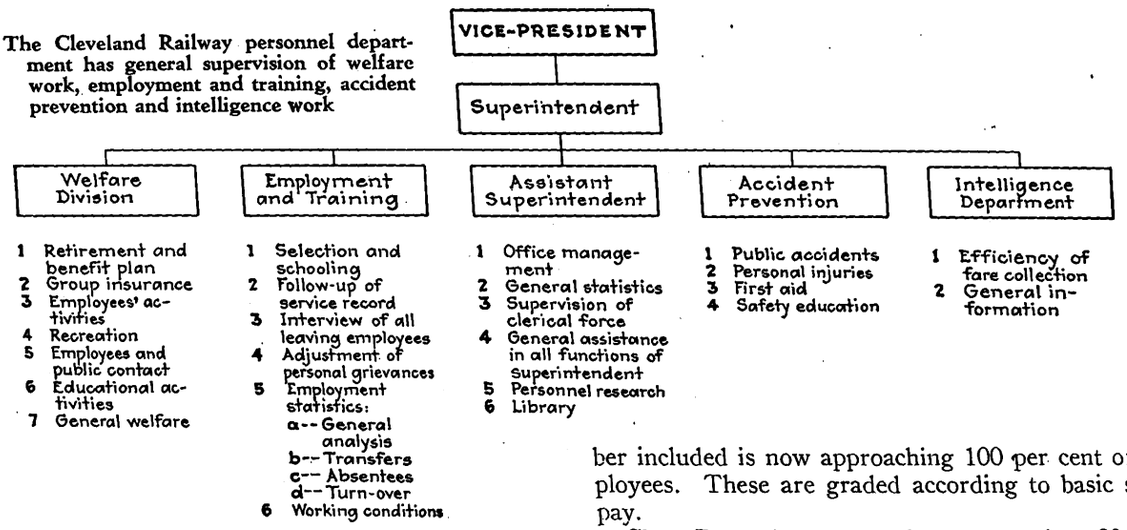
The Cleveland Railway personnel department has general supervision of welfare work, employment and training, accident prevention and intelligence work



July 1, 1927, further group insurance benefits have been made available. These include an additional $500 in group life insurance, accidental death and dismemberment insurance, sick and accident benefits, and definite retirement benefits. All these are handled on a co-operative basis. The deposits of the employees go toward payment of premiums from Aug. 1, 1927. The benefits now available include group life, the Metropolitan benefits, and state compensation in the event of occupational death. They are shown in an accompanying tabulation. In this are listed the amounts that would be received by beneficiaries of employees in the event of death after various periods of service. The maximum group life insurance is paid after a minimum of eleven years of employment.

Retirement and Benefit Plan Popular

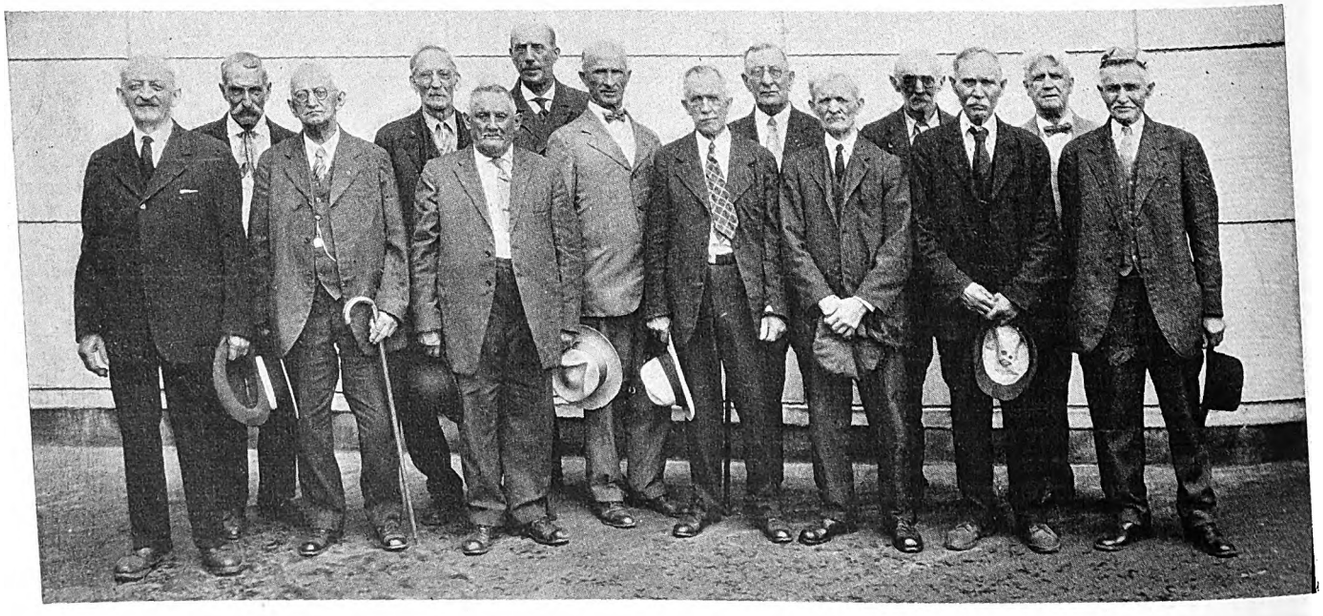
The retirement and benefit plan, underwritten by the Metropolitan Life Insurance Company, was accepted by 90 per cent of the 5,000 employees 48 hours after its announcement. In less than one week more than 95 per cent had signed their application cards. The total number included is now approaching 100 per cent of all employees. These are graded according to basic salary or pay.

Class B employees constitute more than 80 per cent of the total, and hence are taken to illustrate the work-

TABLE I—INSURANCE PROTECTION OF EMPLOYEES OF CLEVELAND RAILWAY

Years of Service	Total Amounts Paid Beneficiaries—Natural Death	Non-Occupational Accidental Death	Occupational Accidental Death	Annual Cost to Employee (See Note)
½	$1,250	$3,250	$9,750	$4.80
1	1,500	3,500	10,000	4.80
2	1,600	3,600	10,100	4.80
3	1,700	3,700	10,200	4.80
4	1,800	3,800	10,300	4.80
5	1,900	3,900	10,400	4.80
6	2,000	4,000	10,500	4.80
7	2,100	4,100	10,600	4.80
8	2,200	4,200	10,700	4.80
9	2,300	4,300	10,800	4.80
10	2,400	4,400	10,900	4.80
11 or more	2,500	4,500	11,000	4.80

Note—The above figures apply for those listed in the Metropolitan plan as Class B employees, who pay $2.50 per month. Of this amount only 40 cents purchases insurance for accidental death, while the balance of $2.10 purchases health and accident insurance and pension accrual, which, at the age of 65, and for 25 years of service, amounts to interest at 6 per cent on $10,000. The total insurance shown above includes the Travelers' group life and the state compensation, inasmuch as the employee will practically conceive that he is receiving all of the benefits for his contribution. Technically, the amounts shown are received for $4.80 a year, or it may be said the benefits indicated, plus pension accruals and health and accident protection to the amount of $20 a week, are received for a total cost of $30 per year.



Fourteen Cleveland Railway employees who have a combined service of 667 years, an average of 47 years each

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ings of the plan. All active Class B employees, for a monthly contribution of $2.50, receive:

1. $500 additional group life insurance (the Cleveland Railway paying the entire cost).
2. $2,000 accidental death and dismemberment insurance.
3. $20 weekly sick benefits.
4. $20 weekly accident benefits (non-occupational).
5. Monthly retirement benefits for life, commencing at age of 65 after 25 years of service, in amount of $2 per month for each year of service up to retirement.
6. Monthly disability retirement benefits, provided at least twenty years of service have been completed, in amount of $2 per month for every year of service up to disability.

Approximately 100 employees of the Cleveland Railway had attained an age of 65 on July 1, 1927, with 25 or more years of service to their credit and, therefore, were eligible for pension. A total of 85 of these men have since been pensioned. In the period between July 1, 1927, and Jan. 1, 1928, 266 employees received benefits on account of illness or accident.

The girl's basketball team is another of the organizations fostered by the company

Employees Participate in Administration of Benefits

While the administration of the group life insurance rests with the welfare division of the personnel department, the Metropolitan plan represents a co-operative effort between the trainmen and the Cleveland Railway. Therefore, it was found desirable to have a joint administration by the members and the company. This was done through the creation of a general committee and an advisory committee. The general committee is elected by ballot by the members within the six major departments. In determining the choice of individuals for this committee two elections are held, one primary and the other final. At the latter election votes are cast upon the two employees receiving the highest number of votes in the primaries.

The general committee attends to routine administrative matters, especially as they involve the different departments which the committeemen represent, and carries into effect the regulations prescribed by the advisory committee. The latter committee consists of the chairmen of the six major department committees and six members who are appointed by the president of the railway. The appointed members include the vice-president and general manager, the superintendent of personnel, the auditor and the chief surgeon. From this membership are elected a chairman and a secretary. The advisory committee members hold office for one year, or until their successors are chosen. This committee's duties are to supervise the working of the retirement and benefit plan and to assist and advise the general committee.

Membership in the retirement and benefit plan consists of five classes, which are determined in accordance with the yearly salary or wages. Any regular employee of the Cleveland Railway who has been continuously employed for six months or more is eligible. The dues are deducted monthly by the company from the pay of each member. In the event of death there is paid to the beneficiary the amount of group life insurance then in effect on the life of the insured. If death occurs accidentally, additional insurance is paid.

TABLE II—SALARY BASES FOR DETERMINING DUES FOR PARTICIPATION IN BENEFIT PLANS OF CLEVELAND RAILWAY

Class	Annual Basic Rate of Salary or Pay	Amount of Monthly Dues
A	$1,500 and under	$1.50
B	1,501 to 2,100	2.50
C	2,100 to 2,700	3.50
D	2,701 to 4,500	4.50
E	4,501 and over	6.00

TABLE III—AGES OF EMPLOYEES MAKING HEALTH CLAIMS, OCT. 30–DEC. 3, 1927

Age, Years	Number of Claims	Age, Years	Number of Claims
20-25	5	50-55	9
25-30	10	55-60	10
30-35	18	60-65	9
35-40	15	65-70	3
40-45	11	70-75	1
45-50	10		
Total			101

TABLE IV—EMPLOYMENT STATISTICS, MONTH OF NOVEMBER, 1927

	Motormen City	Motormen Interurban	Conductors City	Conductors Interurban	Total Trainmen	Coach Operators
Applications received	0	0	1	0	1	25
Assigned to training school	0	0	0	0	0	29
Reinstated	1	0	0	0	1	0
Employees resigned	4	0	6	0	10	0
discharged	0	0	0	0	0	2
died	2	0	0	0	2	0
pensioned during month	2	0	0	0	2	0
failed to complete training	0	0	1	0	1	0
Total trainmen and coach operators leaving the service	8	0	7	0	15	2

	Motormen		Conductors		Total Trainmen		Coach Operators	
	1926	1927	1926	1927	1926	1927	1926	1927
Total number of employees in service, month of November	1,538	1,397	1,428	1,376	2,966	2,773	198	207

Notable Decrease in Labor Turnover

It is interesting to note what has been accomplished in the comparatively short time the personnel department has been functioning, not alone as regards the work of the welfare division, but also with respect to employment. There has been a notable decrease in labor turnover. The advantages of the retirement and benefit plan naturally were not felt until some time after the announcement of the plan, which was on July 18. Accord-

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ingly the results for the latter months of the year are the better measures of its effect on labor turnover.

Accident prevention is another phase of the personnel department's work in Cleveland. The accident prevention division, which was actually functioning before the organization of the personnel department on July 1, was subsequently included as a division of that department. During the latter months of 1927 there was a notable reduction in accidents. The 1,081 accidents reported by the stations for November are 41 less than occurred in the previous month, and 266 less than in November of the year previous.

Throughout the Cleveland Railway organization there has been growing an appreciation of the value of the personnel department's work. Special effort is being made to keep employees advised of definite instances where the welfare division has been of general assistance to the company's men. All this is predicated upon the idea that the development of a contented and efficient body of employees is contingent on keeping them in the best of health and free from mental worries.

Novel Merchandising Method Employed by I.C.&E.

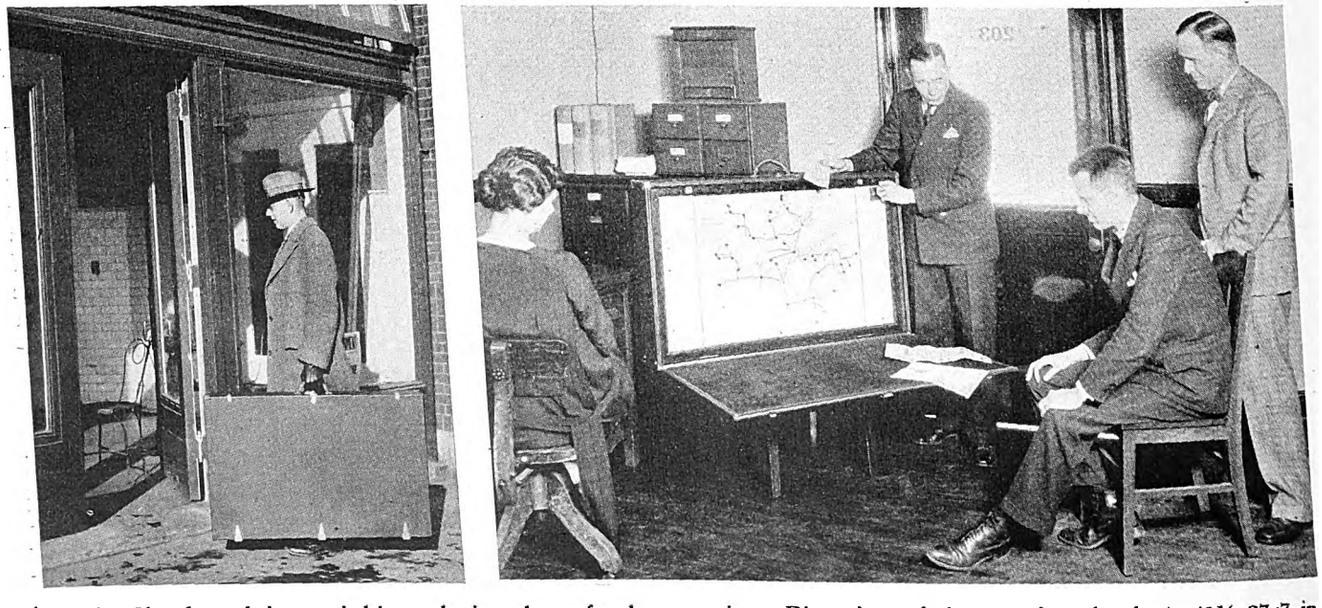
IN SOLVING the problem of how to present most effectively direct information to various traffic groups, civic organizations and large freight shippers of Dayton, Ohio, William R. Huffer, traffic manager Indiana, Columbus & Eastern Traction Company, developed a novel merchandising idea. His plan is to bring before the shippers a picture of the company's service, and for this purpose he has invented "A Sample Case of Electric Railways." The method of using the sample case to bring the information before the shipper is well organized and effective.

Having in mind the personal contact wherever possible in their sales activities, the I. C. & E. traffic men utilize the telephone for appointments with shippers. Conversation is brief and to the point, stressing the idea that within the short interval of seven minutes time the contents of an electric railway sample case may be displayed to the mutual advantage of both shipper and carrier.

Promptly at the appointed time, the I. C. & E. representative arrives, carrying a neat, compact case whose appearance harmonizes with the best of office equipment. Proceeding without unnecessary delay, he places the case on an office desk or chair. The plush-lined lid is opened downward, revealing a colored beaverboard map showing the electric railway service via the I. C. & E. lines to and from Dayton, Ohio. A total of 40 miniature electric lamps locate the cities on the map, indicating first, second and third morning service according to the colors of the electric lamps, which are red, green and orange, respectively. Dayton, Ohio, the point of orientation, is indicated by a white lamp. A small three-pole electric switch is located in the upper right-hand corner of the map. Placing himself convenient to this, and lighting the single white lamp indicating Dayton, Ohio, the representative begins his talk.

The sample case was built for use of traffic men at Dayton only. However, the maps, as may be constructed for use in other districts, are interchangeable. Thus with a series of the beaverboard maps, properly wired to illuminate the electric lamps, indicating first, second or third day delivery to and from other districts in the territory, the company would be in a position to use the sample case at any point for demonstration.

Dimensions of the case when closed are 41½x27x7 in. It is made of strong light-weight wood covered with Pantasote. It has brass fittings and a leather carrying handle. The map frame is of mahogany and the lid and inside are lined with green plush. A three-pole automatic switch control for the lamps is located in one of the upper corners, convenient for the operator. Electric railway lines on the beaverboard map are painted in red, stations are named in black, and lakes and rivers are in blue. The map is hinged at the bottom so that the wiring and battery compartments in the rear of the case can be easily reached. Dry cell batteries furnish current for illuminating the 41 small lamps.



At left—Closed case being carried into a business house for demonstration. Dimensions of the case thus closed are 41½x27x7 in. At right—Actual demonstration of the sample case. By lighting the three series of lamps, the demonstrator indicates the points of first, second and third morning service, respectively

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Model
Municipal Traffic Ordinance
Proposed

Many provisions directly affecting the operation of street cars and buses are included in the tentative draft prepared by a committee of the National Conference on Street and Highway Safety

SUPPLEMENTING the uniform vehicle code approved by the National Conference on Street and Highway Safety at its meeting in 1926, a tentative draft of a model municipal traffic ordinance has now been prepared by a committee appointed for this purpose by Secretary of Commerce Hoover. This model ordinance covers such purely local matters as the authority of local police in the direction and control of traffic, the erection of necessary signs and signals, parking regulations, special rules for the protection of pedestrians and certain driving rules peculiarly necessary on city streets. Many of these provisions directly affect the operation of street cars and buses.

During the past summer and fall the committee carried on preliminary work, including an analysis of the traffic ordinances of 100 American cities together with the model ordinances existing in several states and a study of the subject matter appropriate for an ordinance adaptable to the needs of municipalities throughout the country. At a meeting in Washington Dec. 7-10 the committee developed this material into a preliminary draft. This has since been further revised by the committee and put into tentative form for criticism and comment.

It is recommended by the committee that the regulations be as simple and few in number as possible and that they be reasonably designed to increase safety and at the same time facilitate the movement of traffic. It is believed that reasonable regulations so designed will command respect and will, to a large extent, be self-enforcing. On the other hand, unreasonable or unduly restrictive measures arouse resentment and invite disobedience and cannot be enforced by an army of traffic officers.

Official Traffic Signs Needed

When a municipality adopts and proceeds to enforce even the simplest traffic ordinance, it is impossible for the public to bear in mind all of the regulations with reference to parking and other matters, and the necessity is apparent for the erection of signs and signals and the placing of markings to give immediate and constant notice of regulations. There is need for such indications as parking time limits, places where parking is prohibited, and through streets at the entrances to which stops are required—not merely for the benefit of residents of the locality but to give notice to visitors in the community.

It is highly desirable that all official traffic signs and signals erected under the ordinance be uniform as far as practicable for particular purposes throughout the city. It is also desirable that they be standardized and conform as far as possible with those of other municipalities. When every municipality adopts the same general system of signs, markings and signals, the motor tourist as well as the pedestrian visitor will readily recognize and may be expected to observe the regulations in whatever municipality he may find himself. It is recommended, therefore, that the City Council or other local authority, when determining the character of official traffic signs and signals, give careful consideration to and if possible adopt the standard system of signs recently recommended by the American Engineering Council, which was prepared by a committee appointed by that body at the request of the National Conference on Street and Highway Safety.

Traffic Control Signals Discussed

The utility of traffic control signals depends primarily upon the judgment with which they are installed and operated. In considering traffic signals it should always be remembered that they stop as well as pass traffic, and municipalities may well proceed slowly and act only upon definite traffic analyses. Signals should be installed only at those intersections where there is a real need for them and where they will be of real benefit, for either or both of the following reasons: (1) Where the volume of traffic is so large as to prevent free movement, and traffic will be facilitatel by such signals; (2) where they are needed to safeguard pedestrians. It should not be assumed, however, that every intersection where accidents occur necessarily requires a traffic signal; it may be that the hazard can be better removed by other means. Where not required for safety, signals should be installed only where it is reasonably certain that they will expedite rather than delay the traffic.

The report points out that the utility of a traffic signal depends upon the accuracy with which it is adjusted to traffic requirements. The progressive system is generally considered to be the most satisfactory. Its application to any particular street or district, however, requires careful engineering study of the amount and character of traffic and other conditions to insure proper location and timing of the signals. When so laid out the progressive system permits moving a greater volume of traffic, at a higher average speed, with greater safety, than any other.

At present the practice of cities and the opinion of traffic engineers are divided between the three-color and the two-color control systems, the former being subdivided into the "full amber," in which the amber is used at all changes, and the "split amber," in which the amber is used only following the green.

It is not now possible, the report states, to forecast which of these systems will eventually predominate. It is, however, very desirable and entirely practicable that

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whichever system is used the color indications shall have standard meanings.

The total length of the cycle, as well as the division of the cycle between the two (or more) directions, should be determined by careful analysis of the traffic and other conditions. In general, a fairly short cycle is recommended—say 40 to 80 seconds for ordinary conditions. The use of cycles as long as three minutes, of which perhaps two minutes are devoted to one direction, encourages violation by both pedestrians and motorists and delays traffic. With a short cycle, the approaching motorist can so gage his speed, from a distance of one or two blocks, that he will reach the intersection on the "Go" signal and thus avoid having to stop at all.

The ordinance provides that all movements, including turning movements, shall ordinarily be made on the green light. In some cities right turns are permitted on the red as well as on the green light. Some of the ordinances permitting this require that before making the turn on the red light the driver shall first stop at the crosswalk, and shall make the turn with special regard for the safety of pedestrians and other vehicles. Others do not even require the preliminary stop. This practice is not recommended because it violates the standard significance of the red light.

Protection of Pedestrians

One section of the ordinance authorizes the marking of crosswalks at intersections where there is particular danger to pedestrians crossing the roadway. Marked pedestrian crosswalks at intersections serve two purposes. They influence pedestrians to use such crosswalks and to avoid crossing roadways at other points. Also, a marked crosswalk serves to emphasize and to incite obedience on the part of drivers of vehicles to the recommended rule that vehicular travel shall yield the right of way to pedestrians crossing at intersections.

Although the ordinance advisedly makes no provision for pedestrian tunnels, it is recommended that every municipality having large vehicular movement upon its streets, with corresponding volume of pedestrian movement across streets, give consideration to the installation of pedestrian tunnels underneath roadways. Certain municipalities have constructed such tunnels adjacent to schools. The financial outlay has been returned many times in increased safety to school children and in facilitating vehicular travel on roadways. The routing of vehicular and pedestrian movement on different levels avoids conflict between such respective movements and is obviously more effective than any possible means of control of the two kinds of movement on the same level within the same area.

Safety Zones Recommended

The placing of safety zones at street car stops has proved of the utmost value in the protection of persons boarding or alighting from street cars, and in speeding up street car loading. The movement of vehicular traffic past a standing street car is also facilitated. Safety zones, or isles of safety, placed in the centers of wide thoroughfares, have also been advantageous to pedestrians crossing such thoroughfares.

Safety zones in crosswalks are also desirable in or near the centers of wide roadways where there is heavy movement of both vehicles and pedestrians, to afford a place of refuge for pedestrians unable to get entirely across the street before the signal changes, and also for pedestrians at uncontrolled intersections.

One of the most dangerous conflicts between street cars and motor vehicles is to be found where vehicles pass street cars loading or unloading passengers. To permit this without regulation would create a great hazard for pedestrians. On the other hand, to entirely prohibit vehicles from passing any standing street car would unreasonably and unnecessarily hamper traffic flow. It is desirable that an effort be made to adjust these unwise extremes. The committee submits two alternative sections on this subject, the first taken verbatim from the uniform vehicle code, and a revised section which it recommends as tending to expedite traffic without increasing the hazard to street car passengers. The alternate section requires motorists to stop behind the nearest running board or door of a standing street car until passengers have boarded or reached a place of safety, except that where a safety zone has been established vehicles may proceed past a street car at a speed not greater than is reasonable or proper and with due caution for the safety of pedestrians.

Street Car Operation in Relation to Other Traffic

It is desirable that proper regulation prevent, so far as possible, conflict between street car and other vehicular traffic. Street car movement is, of course, limited to rails located in the street. This is one of the most important factors to be considered in adjusting the relationship between such cars and other vehicles. While it is recognized that street railway companies are not granted exclusive right to the use of a portion of a public street, nevertheless, motor vehicle operation should not be permitted to unduly interfere with the free use of the track area by street cars. The ordinance declares it unlawful for the operator of a vehicle proceeding immediately in front of a street car to fail to turn off the tracks as soon as practicable after signal from the operator of the street car.

Street Cars at Intersections

In view of the difficulty in promptly stopping a street car, the ordinance declares that

"When a street car has started to cross an intersection, no operator shall drive upon the car tracks in front of the street car."

It is recommended that street cars be required to obey the "Stop" rule at through streets and traffic control signals at intersections. Numerous accidents have occurred by reason of fast movement of street cars proceeding in opposite directions and passing each other within street intersections. Operators of other vehicles observe and await the passage of a street car from one direction and upon proceeding across the intersection are struck by a rapidly approaching street car from the opposite direction.

Many street railway companies have regulations requiring motormen to exercise special caution on passing other street cars within intersections, and such regulations are highly desirable. Slowing down and ringing of a bell should be the minimum of precaution to be exercised under such circumstances.

Driving Through Safety Zones

The ordinance declares it unlawful for the operator of a vehicle at any time to drive the same over or through a safety zone. In some cities vehicles are permitted to drive through safety zones indicated only by markings when they are not occupied by pedestrians. The committee believes, however, that this practice is fraught with danger to pedestrians about to enter the zone, and

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that it is unsafe to leave the matter to the discretion of the motorist.

The committee believes that municipal authorities and street railway companies should determine the location of street car stops in such places as to afford convenience to patrons and at the same time the least obstruction to other traffic. Particularly, street cars, whether operated singly or in trains, should not stop for the boarding or alighting of passengers at places where any part of the street car remains or extends into any street intersection.

Bus Lines and Taxicabs Included

The proposed model traffic ordinance is by its terms applicable to all motor traffic, including public buses, taxicabs and hackneys operated on the public streets and highways. It is thought that all of the usual rules and regulations designed to facilitate the movement of traffic and to increase safety should apply to buses, taxicabs and hackneys.

Stopping, Standing and Parking

Present city traffic ordinances disclose a multitude of regulations with reference to stopping, standing and parking on city streets. Perhaps no phase of traffic regulation has occasioned more heated debate, irritation and violation of regulations than those pertaining to parking.

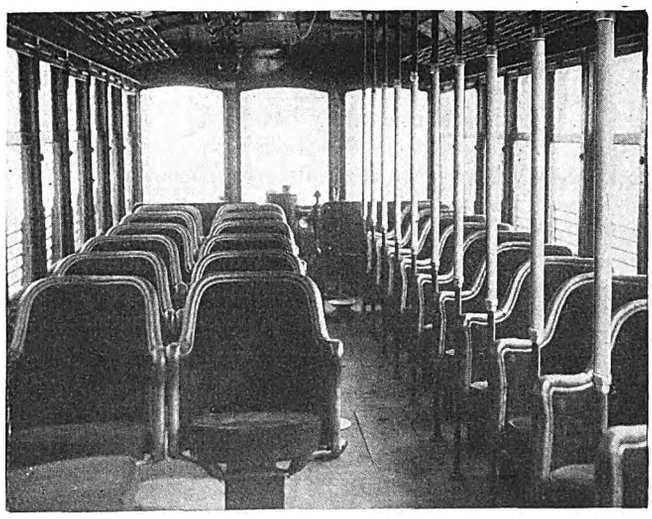
Public highways are required and dedicated primarily for purposes of public travel. However, the stopping and standing of a vehicle when the owner has reached his destination is a necessary incident to this proper use of the vehicle. In so far as the parking or stopping of vehicles adjacent to curbs does not seriously interfere with other uses of the roadway, such parking or stopping is advantageous. When it seriously interferes with the necessary use of street areas for moving vehicles it must give way to the primary use. Likewise, unlimited parking or dead storage of vehicles adjacent to curbs should not be allowed when this interferes with a greater need of the use of such area by a larger number of operators of vehicles desirous of stopping temporarily for purposes of loading or unloading. Also, parking or even stopping should be prohibited in certain areas where the mere presence of a standing vehicle occasions danger to users of the highway, or causes unreasonable interference with traffic movement.

Street Terminals Condemned

The subject of the use of streets by public carriers for terminal or switching purposes has received careful consideration by the committee, but because it was found that conditions were so radically different throughout the country it was thought inadvisable to incorporate in the ordinance a provision prohibiting such use. The committee believes, however, that the use by steam and interurban electric railways of portions of the streets in some municipalities for terminal or switching purposes has become a serious interference with traffic and, therefore, recommends to all municipalities that the use of the streets in congested areas by rail carriers for terminal or switching purposes be otherwise provided for as rapidly as practicable.

Many other subjects also are treated in the proposed ordinance. These include the authority of the police, rules for the operation of vehicles, penalties and procedure on arrest. It is recommended that municipal ordinances in the main be supplemental to state law provisions, and that the latter be repeated only where constitutional provisions require such repetition in order to obtain local enforcement.

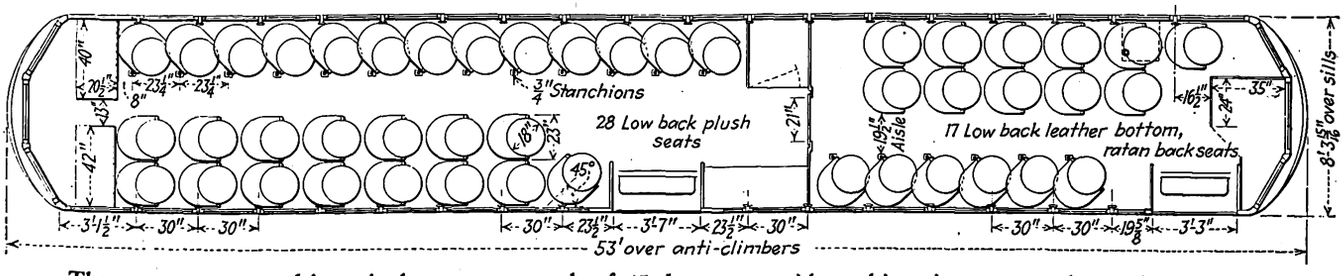
New Seating Arrangement for Pittsburgh Interurban



Seats in the parlor compartment are upholstered in green plush, with leather arm rests, as shown. The seats in the smoking compartment are upholstered in green leather

ONE of the interurban cars of the Pittsburgh Railways, in service on the Washington line, has been equipped with individual bucket type seats, arranged differently from any previous type. After a two weeks trial the decision was made to equip in a similar manner the remaining fifteen interurban cars of the 3700 series. They will be used on both the Washington and Charleroi lines.

The seats are arranged in a single row along one side of the car and in pairs along the other side. Those in the single row are placed at an angle of 45 deg. with the side of the car, while the pairs of seats are transverse. In the parlor or rear portion of the car the single row is on the right-hand side, while in the smoker or front portion the single row is on the left.



The seats are arranged in a single row at an angle of 45 deg. on one side, and in pairs, transversely, on the other side

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Of the 54 seats in the interurban car, 45 are of the individual bucket type. Those in the parlor compartment have green plush cushions, plush backs and green leather on the arm rests and the seat back edges. Those in the smoking compartment have green leather cushions, cane backs and green leather arm rests and back trim.

In the Sept. 24, 1927, issue of the JOURNAL, a chair car of the Pittsburgh Railways was described, which also uses the bucket type of seat but the seating arrangement of which differs in some respects. This car has two rows of single seats arranged in "sawtooth" manner, as the single row in the latest type. The seats themselves are somewhat different in that they have leather cushions, cane back seats, wooden arm rests and a statuary bronze binding along the edges of the seat backs. The company received a considerable number of commendatory letters from patrons concerning this car. Fourteen additional cars are being equipped with the same seating arrangement and some others with various combinations of the individual seat and the present cross-seat. Both leather and green plush cushions are being furnished, to determine the combination best liked by the patrons.

Using the Billboard to Prevent Accidents

Signboards erected by the Lehigh Valley Transit Company at hazardous points along the system have proved effective in warning motorists and children of attendant dangers

FATAL accidents practically have been eliminated and minor accidents reduced surprisingly on the lines of the Lehigh Valley Transit Company, Allentown, Pa., by erecting billboards with safety messages and pursuing a rigid safety policy. The billboards have proved a wise investment since claims and subsequent lawsuits have been avoided, and the cost of repairing damaged rolling stock reduced. In addition, the move has created much favorable comment on the outside and is serving as an effective public relations measure.

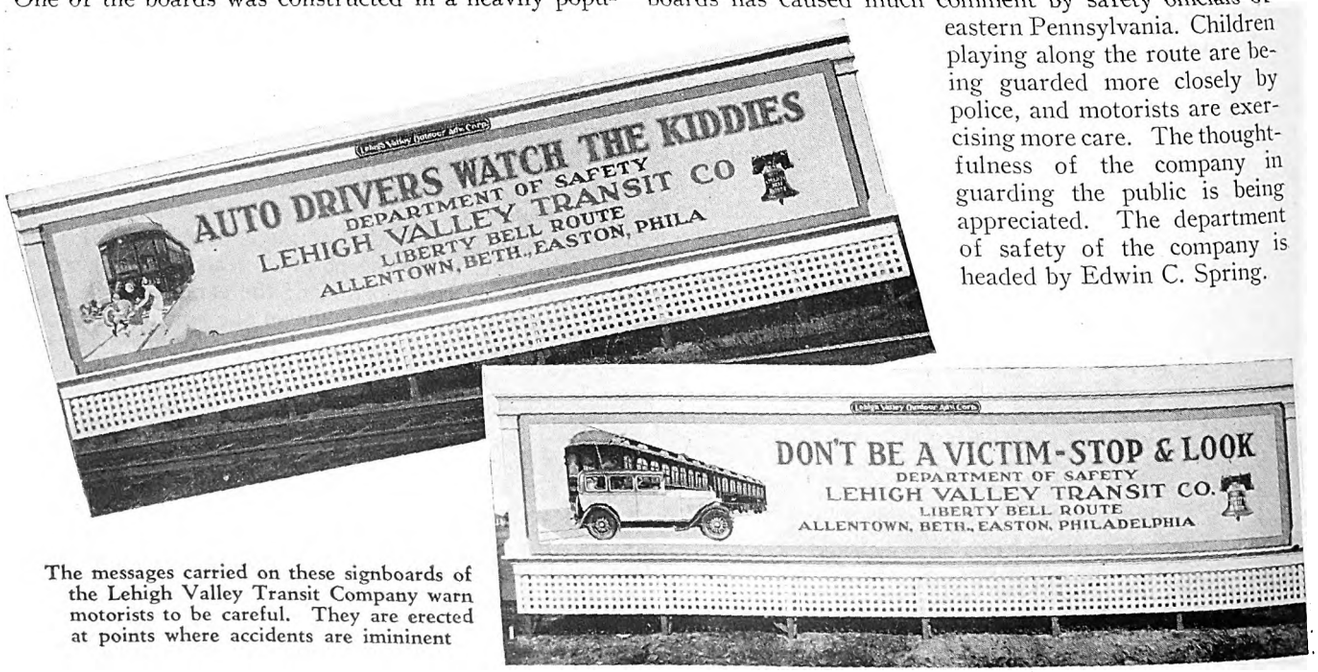
On the extensive system of the Lehigh Valley there are many dangerous points at which trolley crews had been warned to exercise extreme caution. Because of the recklessness and lack of consideration of the other party, the warnings proved of no avail. The company, therefore, decided to bring its message before the public. Billboards were advocated as the best medium and were erected at all the critical points. The billboards are very large, are brightly colored and bear forceful messages.

One of the boards was constructed in a heavily populated district at a point where children were accustomed to play in the streets and where once a little boy was decapitated by a passing car. The poster pictures two boys skating dangerously close to an approaching street car and bears the message, "Streets are not playgrounds."

Another was erected at a place between Allentown and Bethlehem, where automobile traffic is very large and where several people have been hit in passing behind trolleys. "Auto drivers—watch the kiddies" is the warning this board gives. It depicts a mother and her two children passing around the rear of a trolley and about to step into the path of a moving automobile.

There are several grade crossings on the Liberty Bell Route to Philadelphia that are now protected by the signboards. One of these cautions "Don't be a victim—stop and look." It shows an automobile just escaping being hit by a two-car Philadelphia limited. Another, showing a similar escape, reads "Some time you will lose."

The big reduction in accidents effected by these signboards has caused much comment by safety officials of eastern Pennsylvania. Children playing along the route are being guarded more closely by police, and motorists are exercising more care. The thoughtfulness of the company in guarding the public is being appreciated. The department of safety of the company is headed by Edwin C. Spring.



The messages carried on these signboards of the Lehigh Valley Transit Company warn motorists to be careful. They are erected at points where accidents are imininent

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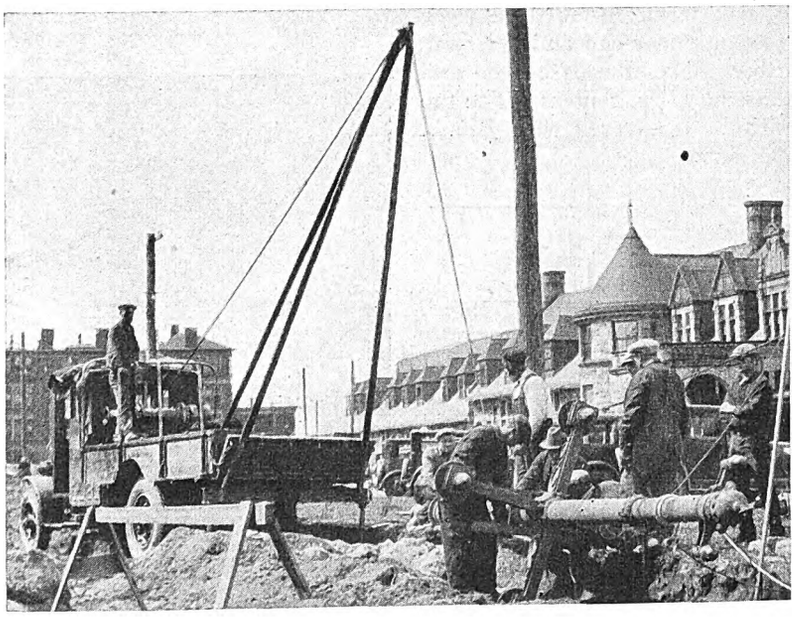
Maintenance Methods and Devices

General Utility Line Truck*

By R. T. Chiles
Master Mechanic Cumberland County Power & Light Company, Portland, Me.

IN ORDER to cut labor cost on line work without investing a large amount of money in equipment used infrequently, the Cumberland County Power & Light Company has equipped a special truck with a removable tripod and winch. Four G.M.C. trucks of 2-ton capacity were purchased and equipped with Meade-Morrison No. 904 drum winches with a high mounting. Special bodies were built and compartments were included to take care of necessary material and hardware for the construction work. Each truck has a special tripod built in the company's shop. These tripods are adjusted easily and can be removed from the truck when desired. The winches and tripod connections are mounted directly to the truck chassis. In position, they make the truck very efficient, having been found especially useful for unloading and loading poles and for setting them in position. The winches are also used for pulling cable and wire.



Convenient type of line truck with winch and tripod developed in Portland, Me.

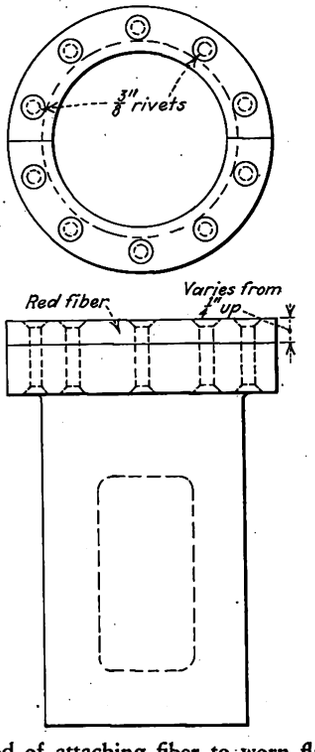
To adjust the tripod in position, a piece of I-beam is bolted to the end of the truck chassis frame and is braced from the end of the I-beam back to the side of the truck chassis frame. Four pieces of angle, two on each end, are bolted to the I-beam with a bolt connected to each pair. To these bolts are attached the forged hooks on both ends of the two side legs of the tripod. There are also two adjustable rests or jacks, which slip on the ends of the bottom edge of the I-beam to take the weight off the truck spring. The third leg of the tripod is in two pieces, one telescoping inside the other for the purpose of adjusting the tripod to the maximum and minimum height. The bottom end of the third leg is adjusted to the truck chassis by means of a link, one end being fastened to the swivel foot on the tripod and the other to the connecting jaw bolted to a piece of channel section that is securely bolted transversely to the truck side frame.

The top ends of the two outside legs are equipped with forged eyes. The third or center leg, with a yoke that carries the sheave wheel with guard, is mounted on a hollow steel axle. To assemble the tripod all that is necessary is to put a shoulder bolt through the eyes and the hollow axle. This takes from five to ten minutes.

Submitted in Electric Railway Journal Prize Contest.

Fiber for Bearing Flange

WEAR of axle bearing flanges is always greater in some localities than in others. It is uneconomical to scrap the bearings and it is the general practice on many roads to build up the surfaces in some manner so that additional mileage can be obtained. This problem has been bothersome on the New York & Harlem Railroad, New York City, and numerous tests were made to determine the best method for building up these surfaces. It was determined finally that greater life could be obtained if the surface is built up with red fiber. All axle bearing flanges are now faced off and drilled for the reception of ten $\frac{3}{8}$-in. flat-head rivets. A piece of red fiber is then riveted to this trued surface and the fiber face and flange are trued to a perfect surface. This shop endeavors to restore the flange to as near its original thickness as possible with a minimum of labor. Therefore the thickness of the fiber used varies from $\frac{1}{4}$ in. up, depending upon the amount of wear. It is claimed that with moderate lubrication a fiber faced flange will give a longer life than a babbitted surface.



Method of attaching fiber to worn flange of axle bearing

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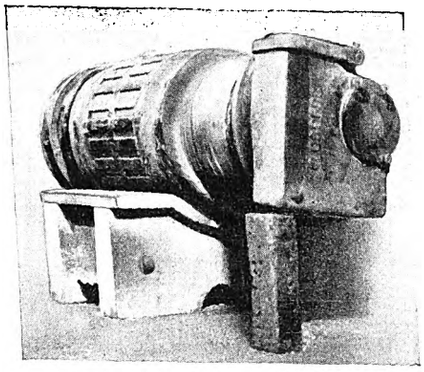
Portable Armature Rack



Armatures are kept off the floor with this type of stand

CARELESS handling of armatures through the shop for various repair operations often causes failures which are sometimes not discovered until the final test is made. Often the fault does not develop until shortly after the armatures are returned to service. This incurs considerable avoidable work and increases materially the annual maintenance cost.

In the shop of the Binghamton Railway, Binghamton, N. Y., a special armature rack eliminates the necessity of placing the armature on the floor and prevents damage to the coils and commutators by coming in contact with obstacles or metal chips. The rack was designed and built in the shops. Armatures undergoing repairs are stored on these racks until all work is completed, when they are put in their places on the large armature racks. These racks are about 11 in. wide by 18 in. long by 8½ in. high. The feet are made of 2½-in. oak and are concave to correspond to the contour of the armature. A 2-in. x 4-in. oak block installed between these feet on either end and tied with a ¾-in. bolt makes the base rigid and maintains the 11-in. centers. The top of the frame is covered with ¾-in. x 2-in. oak strips.

New Equipment Available

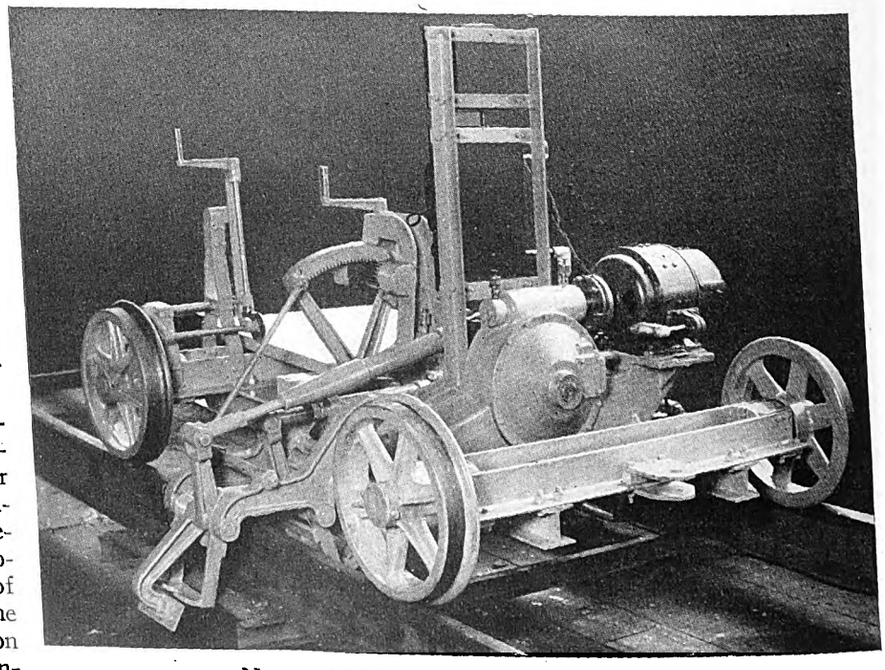
Compression Tamper Is Redesigned

FOLLOWING a careful redesign, based on field tests made in Buffalo after the first showing at the Cleveland convention last fall, the International Steel Tie Company, Cleveland, Ohio, has shipped a new model "A" compression tamping machine to the Kansas City Public Service Company. The new machines have 19 in. diameter standard electric railway wheels and a lifting mechanism for the two sets of tamping arms which raises and lowers them. In the raised position all the tamping mechanism is clear of the rail head and the paving, so that the machine can be hauled to the work behind a motor car or work train. The rack and pinion arrangement which does the lifting also provides for adjusting the tamping arms for rails from 5 to 7 in. in height.

The drive from a 2-hp., 550-660-volt d.c. motor is through a completely-inclosed worm reduction gear running in oil, with the clutch contained in the same housing as the reduction gear. The machine is propelled along the track by means of hand-operated drive geared to the rear axle. The operator's position has been located carefully for convenience of control. Hand levers and clutch pedal are within easy reach, while the position of the tamping arms and their action as they compress the concrete under the plates are in plain view of the operator.

A new principle in track construction with concrete ballast and steel ties is involved in compression tamping. While theoretically concrete is a fluid, it is well known that even after thorough mixing it contains air and water pockets and is capable of considerable reduction in volume, as is indicated by ordinary tamping methods. Moreover, this principle avoids mere puddling of the mix, which has a tendency to cause a settlement of the heavy aggregate. The 300 to 500 lb. of compressive force applied by compression tamping drives the concrete, without disturbing the relative position of the aggregate, into complete and full contact with the tie-bearing surfaces. The result is a solid support for the track structure over a very large area of tie bearing by a more dense concrete than is obtainable in any other way.

The operator's position has been chosen carefully to give a good view of the action of the tamping arms



New model "A" compression tamping machine

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Association Activities

Service Improvement Occupies Attention of Southwestern Transportation Men

ELECTRIC railways occupied an important place on the program of the Southwestern Public Service Association during its annual meeting at Dallas, Texas, May 2-5, 1928. More than 500 utility men, representing electric, gas and railway properties in the fast-growing Southwest entered into the spirited discussion of the problems of their respective branches of the utility industry.

An address by President R. P. Stevens of the American Electric Railway Association, which in his absence was read by J. W. Welsh, general secretary, was one of the features at the general sessions. Mr. Stevens brushed aside all details and sounded a keynote of confidence in the future of the electric railway industry by a graphic presentation of the part which it plays in the life of American communities. The greatest problem of transportation companies today he said is that of keeping abreast of the times. Mr. Stevens' address is printed elsewhere in this issue.

President M. T. Walker of the Southwestern Association expressed in his annual address a similarly optimistic view of the railway outlook. "The street railways are spending their money and energy to render better service and the public is looking with favor upon fare adjustments which will approximate adequate compensation for good service," he said.

Relieving Traffic Congestion

Meetings of the railway section were devoted to the discussion of the general subjects of traffic, personnel selection and training, bus operation and car ride merchandising. Charles Gordon, editor Electric Railway Journal, outlined the progress that has been made in the relief of traffic congestion. "Traffic congestion," he said, "is primarily a community problem, not a transportation problem. It is, of course, of direct interest to transportation men because of the effect which congestion has upon the operation of public transportation facilities. But substantial and permanent relief measures are dependent on enlisting the support of all the factors in a community that are affected by traffic.

"Congestion has particularly serious consequences to centrally located business and property. It keeps people out of the central business districts, and as a consequence the development of outlying community and business centers has been proceeding rapidly because many people refuse to subject themselves to the hazards and inconveniences of downtown travel. As a consequence downtown banks, department stores and shops of various kinds have been forced to establish branch establishments to reach customers who cannot conveniently come into the central district to do business. The threat which thus exists to the stability of investments in centrally located property makes the problem of bringing about relief from congestion of vital importance to those very business and property interests that frequently stand in the way of proposed remedial measures." Mr. Gordon said that transportation men are in a position to play an important part in helping to bring about improved traffic conditions, but that their success in such activity is dependent on their winning the confidence of the community through directing their efforts to improvements in the interests of the community as a whole and not merely that of the transportation company.

The importance of basing traffic regulation upon sound principles of street economics was emphasized. The speaker held that the purpose of regulation should be to serve the interests of the greatest possible number of people, and not any particular class of vehicle. He said that sound traffic regulation should be based upon the following principles: (1) The best interest of the community as a whole must take precedence over all other considerations in the allotment of street space; (2) regulation should be built on the principle of serving the interests of the greatest number of people; this is not synonymous with the number of vehicles; (3) use of street space as a public garage is a privilege, not a right.

Congestion a Community Problem

In the discussion of this question D. C. O'Dowd, superintendent of transportation New Orleans Public Service, Inc., agreed that congestion is a community problem even more than it is a transportation problem. He suggested the opportunity that exists for electric railway companies to render a distinct service to their communities through the employment and training of engineers qualified to aid in bringing about traffic improvement measures.

Parking was held by A. F. Townsend, manager Northern Texas Traction Company, Fort Worth, to be one of the bad practices that materially decrease the capacity of existing streets. He expressed the opinion, however, that short parking periods produce more traffic interference than do longer intervals, because frequent changes in parked vehicles result in more frequent interruptions to the traffic stream due to automobiles moving in and out of the parking spaces.

According to L. L. Allbritton, general manager Wichita Falls Traction Company, most electric railway men need to change their conception of their own business. The only possible means that is available for discouraging the use of private automobiles that produce traffic congestion and also reduced railway revenues, is that of offering a more attractive and more convenient public transportation service. G. I. Plummer, superintendent Dallas Railway & Terminal Company, cited the improvement in traffic movement in Dallas that has resulted from the elimination of parking in the business district during the morning peak traffic period.

B. R. Brown, chief engineer Dallas Railway & Terminal Company, questioned the possibility of getting acceptance of engineering recommendations for traffic relief and cited the experience of the Dallas Technical Club after it had spent almost a year in making an intensive study of traffic matters and had developed a report suggesting measures for relief. Mr. Gordon held that the process of improving traffic conditions has only started when the measures for relief are determined. A very important requirement is that of enlisting public interest in the proposed measures and winning the co-operation of the several interests in a city that are powerful in the determination of community policies.

The effect of improved electric railway equipment upon speed and ability to get through congested traffic was discussed by C. B. Frazer, superintendent of traffic Houston Electric Company. He held that faster public transportation service can be developed only through the better utilization of all electric railway equipment, and that although it has been demonstrated that new cars are revenue builders in Houston, the mere addition of a few modern cars is ineffective as a means of speeding up service unless the operation of the entire property is tuned up to present-day conditions.

Mr. Townsend supported this view by citing the average speed of car operations in Fort Worth, which has been increased from 8.5 m.p.h. to more than 10 m.p.h. through the purchase of new equipment and the rehabilitation of existing equipment to facilitate the loading and unloading of passengers.

J. W. Welsh, general secretary American Electric Railway Association, was introduced by Acting Chairman Holden, and suggested the advisability of forming local groups in each community to co-operate with the National Conference on Street and Highway Safety as a means of enlisting support

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and co-operation in the application of remedial measures for street congestion.

Personnel selection and training was the subject of an address by C. J. Crampton, superintendent of public relations Dallas Railway & Terminal Company. Three factors were held to be important in the selection of satisfactory electric railway employees. First, the man must be a pleasant-looking representative of the company; second, he must have a certain background of education and intelligence upon which to build further instruction and training for transportation work; third, his record of previous experience and employment is a valuable guide as to any tendency of restlessness that would make him unsatisfactory raw material upon which to build.

Satisfactory results in the training of new men are dependent, according to Mr. Crampton, on the development of a well-planned training system. The job of running a car can be broken down into its elements so as to facilitate the work of training a new man. An important element in the success of such work is the development of properly qualified instructors who are competent to impart operating policies, methods and information to new men. "Even then," Mr. Crampton insisted, "the work of training has only started when the new man has been employed and given an assignment. Assurance of his success as an employee depends on a careful follow-up by a properly organized personnel department.

Additional experience in building a satisfactory body of employees was contributed in the discussion by R. C. Allen, superintendent of transportation Houston Electric Company, Mr. Frazer of Houston and Mr. O'Dowd of New Orleans. Mr. O'Dowd called attention to the fact that a busy conductor sometimes does not have the time or the opportunity to give a satisfactory explanation to a dissatisfied passenger, and cited the success which the New Orleans Public Service, Inc., has had with the plan of having conductors take the names and addresses of such passengers, so that a properly qualified representative of the company may call to give a thorough explanation or otherwise adjust any unsatisfactory experience to which a passenger may have been subjected.

Experiences with Bus Service

Bus operation in both urban and interurban service occupied attention during the Thursday session of the railway section. R. L. Miller, Texas Motor Coaches, Inc., outlined the experience of his company with interurban buses, and R. C. Allen of Houston discussed the development of city bus service by the Houston Electric Company. The problems encountered in fitting the automotive vehicle into a transportation system provoked a lively discussion, and additional comments were added by W. W. Holden of San Antonio, C. B. Frazer of Houston, A. F. Townsend of Fort Worth, Charles Gordon and J. W. Welsh.

After a period of uncontrolled competition by independent individual operators between Fort Worth and Dallas, the Texas Motor Coaches, Inc., was organized by the Stone & Webster Company to acquire and operate a dependable and responsible service between these two cities, and to coordinate this service with that of the interurban line of the Northern Texas Traction Company. All of the nondescript buses formerly used have been scrapped and the line is entirely equipped with new vehicles suitable for providing a responsible service. Experience with this line has demonstrated that bus patronage fluctuates considerably more with weather conditions than does interurban patronage. Wet or inclement weather is particularly discouraging to bus riding, and Mr. Miller attributed this to the fear of skidding in rubber-tired vehicles. The speaker also emphasized that a bus driver is in much closer contact with his passengers than is an interurban car operator, and that his job is even more a sales job than is that of the car man. Successful bus operation was held to be dependent upon having a rate of fare adequate to permit the proper character of service to be given. Experience has shown that the flexibility of the bus lends itself to the development of chartered business much more readily than does the interurban.

The beginning of bus operation in Houston was attributable to a compromise for the elimination of jitneys in that city, according to Mr. Allen. Starting in a small way some four years ago, a total of 65 buses are in use at present. The new express line to Harrisburgh, which is equipped with Twin Coaches, is the latest step in the extension of buses in that city. Mr. Allen expressed the opinion that the bus has its place in any complete public transportation system, but that there is still much to learn about the proper basis of its use, the types of vehicles most suitable for various classes of service, and the factors which affect the success or failure of any given line. Comparison of the relative costs of car and bus operation are hard to make and easily may be misleading unless very carefully weighed.

In San Antonio, bus service has grown to 14 lines with approximately 67 miles of route, according to Mr. Hostetter of the San Antonio Public Service Company. Approximately 20 per cent of the passengers carried by the company are handled on buses, which constitute about 25 per cent of the active equipment in regular operation. In contrast to this Mr. Frazer said that only about 10 per cent of the total passengers carried in Houston are handled in buses, although the number of these vehicles operated is approximately the same as that in San Antonio.

Don't Trust Too Much in Averages

W. W. Holden warned against the tendency on the part of electric railway men to attempt to reduce the experiences of a given line or a given property to averages and generalities in the effort to draw conclusions regarding bus operation. Particularly in the selection of equipment and in surveying the prospects of a given system, the characteristics of any particular line under consideration must be carefully weighed, he insisted. Mr. Townsend called attention to the need for considering both mileage and time in depreciation accounting. In certain classes of service where mileage is low, obsolescence becomes the con-

COMING MEETINGS OF *Electric Railway and Allied Associations*

***May 16-17*—Central Electric Traffic Association, Tuller Hotel, Detroit, Mich.**

***May 17*—Society of Automotive Engineers, Metropolitan Section, Building Trades Club, New York, N. Y., 8 p.m.**

***May 22-24*—Indiana Public Utilities Association, Columbia Club, Indianapolis, Ind.**

***May 24*—New England Street Railway Club, annual meeting, Boston, Mass.**

***May 28-31*—National Association Purchasing Agents, annual convention and exhibit, American Royal Building, Kansas City, Mo.**

***June 4-6*—Midwest Electric Railway Association, Hotel Baltimore, Kansas City, Mo.**

***June 4-8*—National Electric Light Association, Atlantic City, N. J.**

***June 6-8*—Canadian Electric Railway Association, annual convention and exhibit, Toronto, Canada.**

***June 14-15*—New York Electric Railway Association, Half Moon Hotel, Coney Island, N. Y.**

***June 20-27*—American Railway Association, Div. 5—Mechanical, annual convention and exhibit, Atlantic City, N. J.**

***June 21-22*—American Railway Association, Motor Transport Division, Atlantic City, N. J.**

***June 21-22*—Wisconsin Utilities Association, Accounting Section, Hotel Pfister, Milwaukee, Wis.**

***June 28-29*—Central Electric Railway Association, Cedar Point, Ohio.**

***July 8-12*—Public Utilities Advertising Association and International Advertising Exposition, Detroit, Mich.**

***July 18-20*—American Society of Civil Engineers, annual convention, Buffalo, N. Y.**

***July 25-27*—Electric Railway Association of Equipment Men, Southern Properties, Cincinnati, Ohio.**

***July 27-28*—Central Electric Railway Accountants' Association, Detroit, Mich.**

***Aug. 16-17*—Wisconsin Utilities Association, Transportation Section, Sheboygan, Wis.**

SEPT. 22-28, 1928

American Electric Railway Association, 47th annual convention and exhibit, Cleveland, Ohio.

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trolling element in depreciation accounting and a time basis is the more suitable for setting up costs. When the mileage is high, however, that becomes the controlling element in determining the life of a bus. Mr. Townsend also indicated the desirability of charging off a heavier rate for depreciation when buses are new than when they are worn, and when the maintenance cost is increased. By starting with a high depreciation rate when the vehicle is new and maintenance cost is low, the sum of depreciation and maintenance may be made constant throughout the life of the vehicle.

Discussion of the life of buses raised a question of cost accounting practice as it influences the question of judging when a car should be scrapped because of excessive maintenance cost. Richard Meriwether, vice-president and general manager Dallas Railway & Terminal Company, said that the practice on his property is to accumulate maintenance costs for various classes of cars on the property so as to show a comparison of the costs on old and more modern equipment. Mr. Welsh called attention to the timeliness of this consideration of depreciation of buses and outlined the situation relative to the question of depreciation accounting, which is now being considered by the Interstate Commerce Commission and which may result in the requirement for giving much closer attention to depreciation analysis on electric railways than has been done in the past.

Rolling Stock Developments

New developments in cars and buses was the subject of a paper prepared by L. E. Thorne, general superintendent Northern Texas Traction Company, Fort Worth. Mr. Thorne listed some of the more recent improvements that have been made in car design and equipment for reducing operating costs and increasing the attractiveness of the vehicle to passengers. He said that the lines recently equipped with new cars of modern design by the Northern Texas Traction Company have shown an increase of approximately 7 per cent in riding, although there has been no particular increase in population on these lines. With respect to bus design he expressed the opinion that though bus development has been more rapid than has been that of cars, there is still need for improvements that will reduce the cost of operation and insure freedom from service interruptions.

E. S. Meyers, assistant to the vice-president New Orleans Public Service, Inc., indorsed the view that buses have an important place in city transportation, but held that the need is imperative for buses that will accelerate more rapidly than do those at present available. He called attention to the possibility of the trackless trolley for certain classes of city service, particularly since improvements in chassis, motor and control design have eliminated some of the defects experienced in early types of trackless electric vehicles.

Friday's session was devoted entirely to a discussion of the problem of rebuilding the car-riding habit. This was led by W. W. Holden, manager of transportation San Antonio Public Service Company. "No single factor is responsible for the success or failure of a given operation," said Mr. Holden. "On any particular line there are a number of balancing features, each of which must be carefully analyzed and weighed to determine its effect upon the success of that particular line."

Speed of Transportation Is All-Important

Mr. Holden agreed with the general principle that the speed of transportation service is all-important from the standpoint of patronage. But speed is merely one factor. The ultimate success or failure of a line is determined by the time which it takes a passenger to travel from his point of origin to his destination. That is determined not alone by the speed at which cars operate, but in large measure by the frequency of service, the routing of a line, the location of terminals and other similar considerations that are sometimes overlooked by transportation men.

According to Mr. Holden there is a vast difference between city and interurban conditions in determining the relative importance of the various factors that affect passenger comfort. In interurban service, for example, too much attention cannot be given to the matter of the design of seats, whereas in city service there are other items of equal or even greater importance. In the judgment of the speaker the trend toward luxurious seats for city cars can be carried beyond the economic limits of the rates of fare that can be collected for a comparatively short ride in a city car. Although it is important to provide the most comfortable possible seat in city service, the importance of the actual type of seat is overshadowed by the question of whether or not the passenger gets a seat at all, particularly in the rush hour. There is ample reason, according to Mr. Holden, for transportation men to recognize the very live demand on the part of the public for a seat for every passenger, even in the rush hours. Although the economic limitations of city operation seem to make it impossible to conceive a basis for providing seats for all rush-hour riders, the speaker held that it is nevertheless important to give attention to every possible means for making standing passengers comfortable.

Rebuilding Car-Riding Habit

Many other factors were listed as being of extreme importance in the effort to rebuild the car-riding habit. These include ease of riding and quietness, comfort and cleanliness, keeping up with the traffic stream through rapid and smooth acceleration, and employees who have an adequate conception of the importance of the part they play in providing passengers with a satisfactory ride. Mr. Holden contended that fares are secondary in determining the volume of transportation patronage. He declared that the quality of service is the first consideration in determining the success of any transportation enterprise. "Transportation men have been too prone to look at their problems as engineers and to overlook the importance of sales considerations," he said. "A product that people want can be sold at a fair profit, but it is hard to sell at almost any price something they don't want."

At the request of Acting Chairman Meyers, Mr. Gordon discussed the question of merchandising transportation service, and called attention to the need for an adequate analysis of the market for public transportation service as the first step in an effective merchandising program. Mr. Welsh quoted recent statistics prepared by the American Electric Railway Association's statistical bureau, which indicate that the riding habit on public transportation vehicles has shown a steady increase despite the enormous increase in the number of private automobiles in the country.

W. H. Burke, Southwestern district manager Stone & Webster, Inc., was elected president of the Southwestern Public Service Association.

J. P. Griffin, vice-president in charge of operation Texas Electric Railway, Dallas, was unanimously elected chairman of the railway section for the ensuing year, and thereby automatically became a vice-president of the Southwestern Public Service Association.

S.A.E. Metropolitan Section

EVOLUTION of bus design, from an engineering standpoint, will be the subject at the regular monthly meeting for May of the Metropolitan Section, Society of Automotive Engineers, to be held on May 17 at the Building Trades Club, New York, at 8 p.m. Two papers will be presented, one concerning chassis design and the other about body design. The former will be presented by George W. Smith, Jr., works manager of the White Company, and the latter by William C. Naegel, head of the engineering department of the Lang Body Company. A number of prominent engineers will present prepared discussions, and in addition, there will be open discussion from the floor. Carl W. Stocks, editor of *Bus Transportation,* is in charge of the meeting.

Plans for C.E.R.A. Meeting Progressing

EFFORTS are being made by the program and hotel and arrangements committees of the Central Electric Railway Association so that the summer meeting at Cedar Point will be an outstanding event. There will be two morning business sessions filled with interesting topics pertaining to the industry, such as "what the future holds for both city and interurban railways," "merchandising transportation," and other helpful subjects.

In the line of entertainment, there will be ample opportunity for sports.

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The Road to Better City Transportation*

The Organized Street Railway Systems Are Best Fitted to Provide the Transportation for a Community. Theirs Is the Obligation to Provide It and the People's to Make This Possible

By Walter A. Draper
President Cincinnati Street Railway

DOUBTLESS there was a time when the street railway business drifted along uneventfully and was disturbed only by efforts of the public merely to get more of whatever kind of service it happened to be getting without much thought to improving. That has been changed by natural causes including the private automobile, its cousin the public automobile, commonly called the bus and other things.

We in our industry are gradually ceasing to call it the "street railway industry" and are coming to speak of it as "city transportation." The few of us who operated buses ten years ago were called either radicals or fools. Now it is not so much of a surprise to you to be told that the electric railway companies are operating some 10,000 motor coaches in regular service. This, however, does not mean that all of these coaches or even a majority have replaced electric cars, although this has been the case in some small towns. In quite a large measure these buses have been taken on by the electric car operators as a part of the general transportation service, either where rail line extensions might otherwise have had to be made or as additional service to communities already provided with rail car service.

In this recognition of the possibilities of the new type of transportation unit, whatever it may be, lies the promise of better city transportation. Just as those in any industry must adopt new methods, new ideas, even experiment with radical changes in order to keep going, so the men in the transportation industry are going to be progressive enough to take on the new things that give promise in our industry. To paraphrase a trade slogan, "when there is better transportation they will supply it."

Aid of the Business Man Needed

I assume that in talking to this group I am addressing not only city transportation men but those engaged in other pursuits that make them fairly representative of their communities and to those especially I would point out one of the greatest difficulties encountered by the transportation industry in its effort to supply the needs of the cities in which it is operating and that is the enlistment of the understanding and aid of the ordinary business man. I am not going to try to figure out just whose fault it is, but there is in the minds of many the feeling that the street railway will somehow work itself out or be succeeded by something else that will.

This is a wrong attitude. In the first place the street railway operator is now just as much alive to the necessity of meeting the public fairly and providing the best service possible as is the department store or the automobile dealer. He does not do this for the pure pleasure of being a good fellow, but because it is good business, just the same as with the store or the dealer. He is trying his best and should be met half way. In the second place you are all going to need what he has to sell. All of us cannot drive our own conveyances all the time to all of the places to which we wish to go, and the means to get there is being provided by those who are best fitted by training and experience to do so, the men who have broadened the street car business into the public transportation business. In my opinion the rail car is now emerging from the trouble caused by higher costs and the tremendous growth of the private automobile—more the former than the latter, by the way—and with a rate of fare that pays the cost of the ride, it will prove its ability for a long time to come to handle masses more efficiently and more cheaply, even at the higher rates of fare now received, than any other form of local transportation.

Railways Should Provide All Classes of Service

It is true that the motor coach has developed and is still developing and is approaching the street railway car in unit size and carrying capacity, but even if it should provide a substitute for the rail car the street railway man is the one that should make the substitution. He should be expected to do it, aside from his mere willingness to do so. The street railway operator is skilled from training and experience in city transportation affairs. His experience has been bitter enough to teach him the most careful and efficient methods. Being the regularly authorized transportation provider in its community the existing street railway company, if it is alive to its job, is being depended upon to continue to provide both, or all kinds of service. If there is a proper understanding of the situation and a mutual confidence between public and company and a forgetting of the past by both (for both have been to blame) I am sure the public would rather have the existing agency serve it than a newcomer.

Another reason why the existing agency should be expected to give this service is in a spirit of fair play. While it is a fundamental necessity that a rate of fare be allowed sufficient to pay the cost, in which is included a fair return on a fair investment, there is another real problem that is not so easily met. It is the problem of amortizing or writing off abandoned property and it can be seen how it comes into the picture when one contemplates the possible substitution of buses or some other means for cars. What is to be done with the investment in the part retired? Or, taking the extreme view of the extreme bus enthusiast who is continuously insisting that rail cars are doomed, the only way a rail car company can work out its honest investment is by going into the bus business or whatever other new form of city transportation succeeds it. This question must be studied and solved from the point of view of community as well as company, because of the mutual responsibility interdependence. It will not do for one to say, "I have no concern with that problem; let those who risked their money take their medicine, just as I who invest my money in an industrial venture must take my chances of getting it back."

Regulations Have Burdened Railways

The rail lines were built—most of them—in response to public demand. They encouraged the development of what had been unoccupied land. They tremendously increased the value of real estate. They added enormously to the taxable values of the community, and all the time they have been under increasingly drastic public control. They have not been free to charge "all that the traffic will bear." Their rates have been regulated by franchise agreements with the public, by ordinances or by statutory provisions putting their affairs in the control of public commissions. Had they been free to charge whatever fare was needed to assure profitable operation, or had they been free to quit when operation became unprofitable, they would have saved many millions of dollars to the investors. But such has not been the case. They have been required to render service regardless of economic conditions; they have kept on the job when privately-controlled ventures would have quit. Now, when they are prepared to render a new kind of service, their past service, their unrewarded creation of new public wealth, should be taken into consideration.

In any adjustment to new conditions extreme caution must be used in abandoning any rail line and substituting another form of service. If, after intelligent research and study, the decision is reached that unprofitable rail lines should be discontinued, then let us discontinue them. On the other hand, let us avoid repeating the mistake of years ago. Let us be slow to establish bus lines unless they can meet the test of necessity and can either become profitable or avoid becoming an undue burden on the whole system. Once a service is established it is extremely difficult to abandon.

There is another phase of city transportation toward which attention is being directed and that is rapid transit

**Abstract of an address before the group luncheon of the Transportation and Communication Section, Chamber of Commerce of the United States, Washington, D. C., May 8, 1928.*

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provided by other than surface lines. I have had occasion many times to point out that rapid transit is a comparative term. Today we think of subways and private rights-of-way in which and on which high speed can be attained. In providing this form of city transportation the public more than ever has to take an important part because no transportation system in and of itself could raise the money or could afford to build subways at their tremendous cost; and because the construction of subways is very properly looked upon as more in the nature of a grade separation or a two-level street than as merely a part of a transportation system. There is more traffic on the streets now than they can care for and because of all types of transportation the rail car can more readily be put underground it is not reasonable for those who use it to have to pay the cost of providing this additional way. There is no city in the country with anything like a complete subway system into which the taxpayer's money has not gone wholly or in partnership with the car rider's money. The cost is distributed variously in different cities. In some it is determined to relieve the car rider and put the load on the tax payer with the avowed purpose of keeping the fare down. In others the fare has been increased in order that the car rider might bear a proper proportion.

Getting the Public To Pay for Better Transportation a Problem

One of the commonest criticisms of the street railway business is that it is archaic or obsolete. Some of the critics are honest in their beliefs. There are doubtless others who are not. It is true that the development of the automotive vehicle and the vast increase in wealth in this country have created a demand on the part of the public for greater speed and more comfort in city transportation and for more transportation facilities also. In spite of the tremendous growth in the private automobile with all the people it carries the number of revenue passengers carried by public means of transportation has shown a certain growth, with backsets from time to time, and this indicates that, to a degree at least, the more transportation facilities are offered the more traveling there will be. The difficulty has been and is going to be not in bringing about better transportation, just as we must have better homes and better clothes and better food, but in getting people to pay for it. We cannot get diamonds for the price of glass. While large numbers of people will continue to desire a form of transportation that can be provided at the least possible cost, others will be willing to pay for the faster and better service that they demand. An adjustment of these two kinds of service between the numbers that require them will be necessary. A business must be self-supporting or it cannot attract new capital to provide the improvement, development and extension of the service and to undertake experimentation and research. Public funds may supply the capital for subways and two-level streets, but the companies will still need large amounts of capital for which the car rider himself will have to pay.

Indiana Utilities Convention Plans

PRELIMINARY programs are now being distributed for the annual conventions of the Indiana Public Utilties Association, the Indiana Electric Light Association and the Indiana Gas Association, which will be held May 22-24, at the Columbia Club, Indianapolis, Ind.

The Public Utilities Association meetings will be held on Wednesday, the program being announced as follows:

9:30 A.M.

Address by President Arthur W. Brady.

Report of secretary.

Report of treasurer.

"The Government in Business," by John B. Mailing, Hammond, Ind.

"Training of Supervisory Forces," by Morse DellPlain.

2:00 P.M.

"Advanced Safety Measures," by W. R. Hirst, Indiana Bell Telephone Company.

"Indiana's Water Supply," by H. E. Jordan, Indianapolis Water Company.

"Regulation," a paper or remarks by a member of the Indiana Public Service Commission.

"Cultivation Through Advertising." Speaker to be announced later.

7:00 P.M.—DINNER

Address by John F. Owens, vice-president and general manager Oklahoma Gas & Electric Company and national chairman of the N.E.L.A. committee on public relations.

American Association News

American Executive Committee Meets in Washington

National executive body holds its regular meeting during United States Chamber of Commerce session at capital. Progress of Cleveland convention plans reported on

SO THAT electric railway executives could attend the annual meeting of the United States Chamber of Commerce, the American Electric Railway Association executive committee held a meeting on May 9 in the Mayflower Hotel at Washington, D. C. A large volume of the association's business, including the further development of plans for the Cleveland convention, was dispatched during a meeting crowded with constructive discussion.

The large and representative attendance present included the following: President R. P. Stevens, L. S. Storrs, J. H. Hanna, J. G. Barry, S. C. Watkins, F. R. Coates, J. N. Shannahan, R. I. Todd, Thomas Conway, Jr., Thomas Fitzgerald, H. B. Potter, C. D. Cass, Harlow C. Clark, W. A. Draper, E. C. Faber, J. S. Kubu, R. H. Dalgleish, Edward Dana, M. B. Lambert, S. J. Cotsworth, C. R. Ellicott, H. L. Geisse, W. F. Ham, B. A. Hegeman, Jr., L. R. Nash, C. C. Peirce, W. E. Wood, H. J. Kenfield, A. L. Humphrey, Labert St. Clair, Leslie Vickers, J. W. Welsh, A. W. Robertson, Raleigh Reese, C. S. McCalla, W. V. Hill, Charles Gordon and P. W. McGovern.

At the opening of the meeting President Stevens explained that the executive committee had decided to gather in Washington during the United States Chamber of Commerce meeting in recognition of the work being done by that body. He introduced Mr. Humphrey, chairman of the Transportation and Communication Section, who outlined briefly the work of that division of the National Chamber. President Stevens also called on A. W. Robertson, president of the Philadelphia Company, who commented briefly on the status of the local transportation industry. He called attention to the number of inhibitions that rest upon the industry, and expressed the feeling that it is to the industry's credit that it has been able to operate at all under the many restrictions and difficulties which it has experienced. He emphasized the importance of the operating personnel in the success or failure of a local transportation company and expressed the opinion that the importance of the contact made between platform men and the public cannot be overestimated, and that there is a wide field for increased efficiency through more effective use of an operating company's man power.

As national councilor for the electric railway industry, J. N. Shannahan commended the increased interest being taken by electric railway men in the work of the United States Chamber of Commerce and in that of the local chambers in their respective cities. He expressed the opinion that it has been of decided value to the entire industry.

Details of Cleveland Program

Chairman Frank R. Coates of the subjects and meetings committee outlined the tentative program that has been arranged for the convention in

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Cleveland next fall. This includes not only a program for the general sessions, but also a series of luncheon group meetings during four days of the convention. The general subject on Monday of convention week, after the opening formalities, will be "The economics of transportation and the need for public participation in the solution of its problems." Tuesday will be devoted to the inspection of exhibits. Tuesday night is set aside for a program in the hands of the Advisory Council. On Wednesday the general subject will be modernization. Speakers on Thursday will reflect the viewpoints of others regarding the local transportation industry. The subjects of luncheon meetings will include interurbans, traffic, education, merchandising, financing, public relations, new cars, freight, motor buses, and management. Leslie Vickers, economist of the association, will act as manager of the group luncheons.

With respect to the work of the committee on national relations, Chairman J. H. Hanna outlined briefly the effort to obtain modification of the commerce act to clarify the definition of commercial electric railways, and the progress of pending legislation for the regulation of interstate buses.

Dr. Conway Reports on I. C. C. Depreciation Order

For the sub-committee on depreciation, Dr. Thomas Conway, Jr., outlined the progress of developments with respect to Interstate Commerce Commission Order 19157 directing the electric railways reporting to the commission to show cause why the commission's rulings with respect to depreciation accounting for the steam railroads and the telephone companies should not be applied to electric railways. Dr. Conway reported that the hearings are expected to resume about May 10 in the rehearing of the railroad and telephone cases. He could make no prediction as to when the electric railway case is likely to be called. In answer to a question from President Stevens, Chairman Hanna said that although some difficulty had been experienced at first in getting from operating properties information needed by the committee, subsequently there had been full co-operation which had enabled the committee to proceed effectively in the preparation of its case. Dr. Conway explained that the committee on standard classification of accounts was working in co-operation with the sub-committee on depreciation to the end that the former committee is about to undertake a study of the need for revision of the standard classification with respect to depreciation accounting.

J. H. Hanna as chairman reported for the committee on publications. He estimated that *Aera* would about live up to the budget estimated for it at the beginning of the year, and requested for the committee expressions of opinion from the industry as to the content of the magazine and suggestions for its improvement.

In the absence of Chairman Luke Bradley, Mr. Storrs reported for the committee on electric railway finance. This covered a tentative outline of the effort which is being made by the committee to liberalize the terms of car purchase now available through existing car financing agencies. In commenting on the report, J. G. Barry said that it was the opinion of the operating members of the committee that terms approximating 15 per cent down and ten years to pay instead of the customary car equipment terms of 25 per cent down and five years for the balance, would make it possible for railways to buy new cars out of income, and would thus stimulate the replacement of obsolete equipment. He said that the committee expected to be able to report real progress before the end of the year. M. B. Lambert suggested the desirability of making car financing facilities as broad as possible in order that as many car builders and manufacturers as desired to do so might participate. Mr. Barry explained that it was the hope of the committee that an ultimate basis of financing new cars might be developed in which all manufacturers could participate. Thomas Fitzgerald held that first cost of cars is a big factor in discouraging purchase of new equipment, and pointed out that the industry had been demanding custom-built equipment which made the price of new cars excessive. He argued that the industry should be able to buy cars built by the manufacturers on a production basis at considerably lower costs than those usually entailed under existing conditions.

Progress in Insurance

H. B. Potter reported for the committee on insurance. He also expressed the regret of Mr. Emmons, who was unable to attend the meeting. Mr. Potter indicated that the report of the subcommittee on fire prevention is nearly completed. He outlined also the procedure which the committee is following in an effort to work out a basis for discussion of the industry's insurance problem with representatives of the Central Rating Bureau.

C. S. McCalla reported for the entertainment committee. There was considerable discussion regarding some of the entertainment features which have been planned or suggested. General Secretary Welsh presented routine reports for several standing and special committees in the absence of their chairmen. These included exhibits, rapid transit, public speaking, bus depreciation, publicity, membership, *Electric Traction* speed contest, and co-operation of manufacturers. The Illinois Electric Railways Association was reported as a new association member. Present membership stands at 770 company and 1,195 individual members.

B. I. Budd, F. R. Coates, W. H. Sawyer, Thomas Finnigan, J. H. Alexander, J. G. Barry and T. W. Casey were named by President Stevens as a nominating committee. An invitation from Barron G. Collier to hold the next meeting of the executive committee on the yacht *Florida* on the North River in New York on July 13 was accepted.

Exhibit

UP TO the close of business on May 5 a total of 116 companies had filed requests for 65,156 sq.ft. of space at the Cleveland convention. This was the outstanding fact in the report of Chairman J. H. Alexander of the committee on exhibit, presented at the meeting of the executive committee held in Washington on May 9.

Applications were mailed to members on April 14, which is a full month earlier than they were sent out last year. In a number of instances manufacturers who had small space last year have increased their requests this year. However, there have been some membership resignations among the smaller companies. Assignments of space will be made at a meeting of the exhibit committee to be held in Cleveland on May 16. In the meantime, Chairman Alexander suggests that operating member companies instruct their purchasing agents to direct the attention of all salesmen visiting them to the desirability of having their companies participate in the next convention with an exhibit. He is particularly anxious to have a good display of cars in the outdoor track spaces.

New Association Members

FOUR manufacturers, one state association and thirteen individuals were elected to membership in the American Electric Railway Association at the meeting of the executive committee held in Washington on May 9. Resignations were accepted from three operating companies and fourteen manufacturers, while one manufacturing company was dropped. The new members elected are:

Manufacturer Companies

Cowdrey Brake Tester Organization, Inc., Fitchburg, Mass.

Curtin-Howe Corporation, New York.

DeLuxe Products Corporation, La Porte, Ind.

Reliance Manufacturing Company, Massillon, Ohio.

State Association

Illinois Electric Railways Association, Springfield, Ill.

Summary of Uniform Vehicle Code

PAMPHLETS giving a summary of a Uniform Act Regulating the Operation of Vehicles on Highways and a Uniform Motor Vehicle Operators' and Chauffeurs' License Act, as approved by the National Conference on Street and Highway Safety, are now being distributed by the American Electric Railway Association. This summary has been prepared for the convenience of legislators, state officials and others who believe in the principle of uniformity in traffic regulation and who, while not desiring to throw away the existing laws of their own state, are ready and willing to bring these into harmony with other states as far as practicable.

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News of the Industry

Special Session of Illinois Legislature

In the formal call for a special session of the Illinois Legislature to give Chicago home rule and adequate transportation 22 items are included, thirteen of which pertain to Chicago. The call includes legislation for the consolidation of the transportation agencies in Chicago; the building of subways by special assessments, and permits the Legislature to repeal the law limiting street railway franchises to twenty years and to substitute any other fixed period of time, providing all franchises for more than a year shall be approved by the electorate concerned. The Governor's call instructs the Legislature not to consider any franchise which is "indeterminate or terminable."

Although he has not signified his approval of any particular number of years as being suitable for the length of the franchise, the items in the call which have to do with Chicago are to amend the public utilities acts so as to transfer authorities and duties now vested in the Illinois Commerce Commission in regard to Chicago public utilities to corporate authorities of Chicago or in a board or commission elected by Chicago citizens. There is a further suggestion of the need to enact a new law embodying the same provisions giving Chicago the legal right to grant and control franchises; amending the utilities act of June 29, 1921; amending a clause to provide for the incorporation of cities and villages; to give their officials power to permit, regulate or prohibit laying of tracks under terms and time limits not to be perpetual and if exceeding one year not to become effective without approval by a majority of the electors. Finally, the plan is to amend the cities and villages act to comply with the foregoing provision.

Any laws limiting the time of a permit to construct railroad tracks in any city, town or village would be amended, any such amendment to provide against a perpetual, indeterminate franchise. There is an additional suggestion of legislation providing for the construction of subways by special assessment and for the laying and operation of street railroad tracks and power lines. To further unification the Legislature is urged to enact laws or amend existing laws so as to authorize the consolidation and merger of corporations organized to carry passengers for hire.

Public Control Bill of Eastern Massachusetts Signed

The new law which extends for five years more the public control of the Eastern Massachusetts Street Railway has just been signed by Governor Fuller. This makes the act operative. Under the terms of the new measure the board of trustees of the railway is reduced to three members, two of whom are to be appointed by the Governor and one by the directors of the road.

Legislation for Boston "El" Fails

Nothing has come of all the attempts that were made in the Massachusetts Legislature this year to legislate for the Boston Elevated Railway. Numerous propositions were suggested. All that came to a vote were rejected. The only measure not voted on was Elliot Wadsworth's proposal to return the road to the stockholders; this was not pressed because it would undoubtedly have met with the same fate as all the other ideas.

Governor Fuller, who had said that he would keep the Legislature in session all summer, if necessary, to secure satisfactory Elevated legislation, called a conference on that subject on May 7, but no definite action has been announced. It is believed that the Legislature is so unsettled by conflicting views on public control, public ownership, private operation and rapid transit extension proposals that it cannot accomplish anything. In the absence of any legislation the Boston Elevated Railway will continue under public control, subject to two-years notice of termination by either side.

Business Must Build Permanently for Prosperity

Largest United States Chamber of Commerce meeting ever held goes on record to this effect. Walter A. Draper among the speakers

WITH an attendance exceeding that of any previous meeting the sixteenth annual session of the Chamber of Commerce of the United States got under way on May 8 in Washington under the most auspious circumstances. Teamwork in business was the keynote of the meeting. This was based upon the conception that modern business is so interwoven there is a great common responsibility to build permanently for prosperity and to eradicate those elements and influences in each specific industry that tend to seek immediate profit at the expense of stability.

This modern business philosophy was voiced emphatically in an address by Judge Edwin B. Parker, chairman of the Chambers's board of directors. "The profession of business must be purged of those pirates whose acts stigmatize and bring business generally into disrepute," he declared. "Such individuals, unmindful of their duties to the public, inevitably bring upon themselves and the entire institution of business the thunderbolts of public wrath in terms of legislative and governmental regulation that hamper a legitimate freedom of initiative. Ruthless and selfish initiative must be curbed in the public interest and in the interest of legitimate business."

Lewis E. Pierson, the president of the Chamber, came out unequivocally for the maintenance of the Chamber's position on tax reduction. "That position," he declared, "was sound when your committee made its recommendations. It was sound when the membership, by an almost unanimous vote, indorsed it. Nothing has occurred since to modify it. It is sound today. The Chamber is committed to the position that government income and government expenditures should substantially balance. Large surpluses are an inducement for demands on Congress for extravagant spending."

In spite of the great increase in the use of the private automobile, the number of revenue passengers transported by public means of transportation also has increased, it was pointed out by W. A. Draper, president of the Cincinnati Street Railway, at the Tuesday luncheon of the Transportation and Communication group. The more transportation facilities that are offered, he said, the more travel there will be. The difficulty, he said, is not in providing better transportation, but in getting people to pay for it. Some will be willing to pay for a faster and better service, but large numbers of people will continue to demand the form of transportation that can be provided at least cost. An abstract of Mr. Draper's address is printed elesewhere in this issue.

In its refusal to confirm John J. Esch as a member of the Interstate Commerce Commission, the Senate, it was declared by Samuel Dunn, editor of *Railway Age*, acted as a court of appeals and made a decision in the Lake Cargo case when it had not heard the evidence or the arguments.

"Adequate, dependable and speedy railway service, such as we now have,

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is essential to sound, industrial, commercial and financial conditions," Mr. Dunn continued. "We cannot have such service long unless the railways are managed efficiently and in addition are fairly and efficiently regulated. The act to regulate commerce is restrictive enough—perhaps too restrictive. The substitution for it in actual practice of a still more restrictive policy, dictated largely by political considerations, is unfair to railway managers and investors in railway securities, and is a menace to our transportation service and a threat to the economic welfare of the country."

Because of recent scandals associated with men prominent in high business circles, Judge Parker stated that "America and American business are on trial before the world" and he challenged organized business to "cast the beam out of its own eye and set its house in order." He said:

> Just as nations will decline to recognize a government committed to destroying the foundations of civilization, and just as the legal and medical professions purge themselves of unethical practitioners, so will business decline to recognize as a member of the profession of business, and trade associations will decline to receive into their ranks, or will expel, an individual or an organization that wilfully violates the fundamental principles upon which sound business rests, or that persists in ignoring the decencies of business intercourse, and besmatters all business with the slime of corruption or with the muck of unclean practices.

Government regulation of business and government ownership of businesses was also scored by Judge Parker. In this connection he said:

> The Chamber of Commerce of the United States is committed to the principle that government should not enter the realm of business to undertake that which can be successfully performed in the public interest by private enterprise. This principle is politically and economically sound. It is in far less danger from the propaganda of radical agitators than from the members of the business profession who are faithless to their obligations, who break down public confidence, and who provoke government regulation.

This "cleaning of its own house" was advocated as the first step that must be undertaken, in the greater prosperity that is foreseen for American business.

Wages Advance in Cleveland

A wage increase of 2 cents an hour was announced by the Cleveland Railway, Cleveland, Ohio, effective May 1 for the benefit of 2,800 motormen and conductors on street cars and motor coaches. The new rates are 67 cents for the first three months, 70 cents for the next nine months and 72 cents thereafter. The men had demanded a 5-cent raise and recognition of the union. This latter the company refused, on the ground that the Ohio Supreme Court had held that it was against public policy for a utility to make a closed shop agreement. The increase will cost the company $160,000 a year.

Joseph H. Alexander, president of the company, said the men deserved the increase on account of the savings they had effected in accident and power costs. He announced that an adjustment will be made in the wages of shop employees. The shop week recently was reduced from a 54-hour to a 44-hour week, with no increase in the hourly rates of pay. This reduction in hours effected a saving of $350,000 annually in shop expenses. Part of this saving will be consumed in increased rates of pay.

$25,000,000 Terminal Project for Newark

Long-discussed plan involving use of canal bed by local railway comes to fruition. City Commission studying project

PROPOSALS likely to change the whole aspect of the center of Newark, N. J., and alter the present trend of population were made public on May 9 by Mayor Thomas L. Raymond. Envisioned in proposed contracts between the city and the Pennsylvania Railroad and the Public Service Corporation, operating Public Service Co-ordinated Transport, are the construction of a new Pennsylvania station at Market Street, which is also to be a bus and trolley terminal, the routing of the Hudson tube trains over the Pennsylvania tracks as far as South Newark and the consequent abandonment of the Manhattan Transfer and of the present tube terminal at Park Place, the creation of a high-speed trolley line along the right-of-way of the derelict Morris Canal from Pennsylvania station to the Belleville city line and extension of South Broad Street by viaduct over Pennsylvania tracks to connect with state highway No. 1.

In the proposed contract with the Public Service Corporation the city agrees to construct a two-track electric railway in the canal bed and construct stations along the route and build a terminal under the new railroad station. The Public Service Corporation agrees to supply the cars and the power with which to operate them and to pay the city 4½ per cent of the cost of building the stations and the terminal under the railroad station. The Public Service Corporation is to get credit for franchise taxes now paid in the city on all lines using the canal roadbed.

The railway to be built by the city in the canal bed would be leased to the Public Service for fifty years, with a renewal privilege of fifty years. After the first thirty years, either the city or the company could terminate the contract on two years' notice. The Public Service would carry maintenance and repairs on the railway during the terms of the lease.

The whole project will cost $25,000,000, it is estimated. The city will spend $7,000,000 in connection with the erection of the new Pennsylvania station and $5,500,000 on the improvement of the Morris Canal bed. On its part the Pennsylvania will contribute $12,500,000 toward the cost of the station. Five years will be needed to complete the work, which will begin as soon as the contracts are signed.

Hocker Line Resumes Service

After a cessation of ten months, service on the newly organized and rehabilitated Hocker line, now known as the Kansas City, Merriam & Shawnee Electric Railway, was resumed Sunday, May 6. Herman Sonken, president of the line, and W. K. Paul, vice-president, rode the first car over the line. At each of the 33 stations along the 7-mile route, they announced the restoration of service. On the present schedule, the first car will leave Rosehill, Kan., at 6 o'clock. Cars will operate on a half hour schedule in the rush hours and on an hourly basis through the remainder of the day. A fare of 3 cents a mile will be maintained, with regular city fares added from Rosedale into Kansas City.

On Saturday, May 12, the official opening celebration was to take place. A parade of cars from the Kansas City terminus of the line at Third and Delaware Streets, to Rosehill was scheduled. Officials of both cities, the Kansas City Public Service Company, 200 Kansas City business men and a 30-piece band were to be passengers. A barbecue was to be held in Shawnee Park at the conclusion of the parade.

Situation Unchanged in Columbia

Except for an increase in the number of buses operated by the Columbia Bus Company, Columbia, S. C., an independent, there has been little change in recent weeks in the transportation problem in that city—a problem that has been acute since March, 1927, when the cars of the Columbia Railway, Gas & Electric Company went into the carhouses. In the latter part of April, an appeal was taken to the United States Circuit Court of Appeals, sitting at Richmond, Va., from an order of United States District Judge Ernest Cochran revoking an order to stay proceedings in the state courts. The action in the United States Court is to compel the Broad River Power Company, the controlling company, to resume the operation of the street cars.

The Columbia City Council recently passed an ordinance under which a committee has routed the buses of the Columbia Bus Company on 30-minute schedules, but the unregulated 10-cent jitneys are still permitted to run as free lances. Licenses for these jitneys have been refused by the City Council throughout this year and it is believed that under the "route" ordinance they will be driven from the field as their main popularity has been their elasticity.

Another angle to the transportation problem is that in the election for two members of the Columbia City Council, practically every one of the 14 candidates gave his views on transportation and a majority expressed the opinion that the railway was the ideal system. The two men elected, both serving their first term in Council, and both young, have declared their intention of doing what they could to give Columbia "adequate, dependable transportation."

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R. P. Stevens Will Head Allied Power & Light Company

Company, newly formed, under which many important utility properties are being brought together. Well-known engineering and financial interests concerned

R. P. STEVENS has been elected president and B. C. Cobb chairman of the board of the Allied Power & Light Company, organized to consolidate the interests of Hodenpyl, Hardy & Company, Inc., and Stevens & Wood, Inc., New York. It has contracted to acquire substantial stock interests in Commonwealth Power Corporation, Northern Ohio Power Company, Penn-Ohio Edison and other companies.

R. P. Stevens

Systems of great magnitude are being brought together in the new affiliation. They are not only far flung geographically, but they embrace nearly every public utility activity, with no inconsiderable part made up of railway properties. To follow the companies through in all their ramifications would be quite impossible here, but their extent is indicated by the fact that their gross annual receipts are about $50,000,000. This puts the properties well to the forefront of systems of this kind as earners.

Among the companies included but not necessarily in the order of their importance are the Commonwealth Power Company, the Penn-Ohio Edison Company, the Northern Ohio Power & Light Company, the Illinois Power Company, the Southern Indiana Gas & Electric Company, the Michigan Electric Railway, the Electric Railway Securities Company and the Sioux City Service Company. Through one affiliation or another the allied system will include the railways in Youngstown and vicinity, Akron and environs, Chattanooga, Nashville, Grand Rapids, Springfield, Ill., Sioux City and Saginaw and the Peoples Railway in Dayton as differentiated from the other roads there. This summary does not presume to be complete, but it does show that the properties included embrace city, suburban and interurban railway operations of vast proportions.

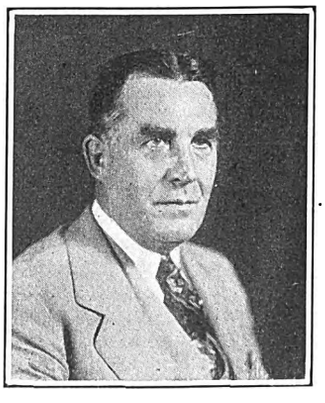
Mr. Hodenpyl and Mr. Hardy, who have been largely interested in Hodenpyl, Hardy & Company, Inc., since its organization, will have substantial investment interests in the allied company, but will not actively participate in its operations.

B. C. Cobb as chairman and R. P. Stevens as president of the new company, with Landon K. Thorne, Alfred L. Loomis, Jacob Hekma, J. T. Harrington and H. S. Scarritt, will constitute the board of directors of the Allied Power & Light Company. Messrs. Thorne, Loomis and Scarritt are officers of Bonbright & Company, Mr. Harrington of the Penn-Ohio system and Mr. Hekma of Hodenpyl, Hardy & Company.

Mr. Stevens, in addition to being president of the new company, is President of Penn-Ohio Edison Company, which is just taking over the Northern Ohio Power Company, and chairman of the board of Stevens & Wood, Inc., also president of American Electric Railway Association.

Mr. Cobb, in addition to being chairman of the board of the new company, is president of Consumers Power Company, Northern Ohio Power Company and is vice-president of Commonwealth Power Company.

Hodenpyl, Hardy & Company, Inc., was organized in 1914 and with its predecessors has for more than 30 years been interested in the organization, development and operation of public utility properties. Many of such properties are now successful component parts of the Commonwealth Power Corporation System. Hodenpyl, Hardy & Company and associated interests were among



W. H. Sawyer

the pioneers in the development of the holding company plan of diversifying utility interests, the development of hydro-electric plants, the long distance transmission of electricity by high-tension lines, and in the distribution of securities on the customer-ownership plan.

Stevens & Wood, directly or through their predecessor companies, for many years have engaged in the general engineering and construction business and the managing, supervising and financing activities of public utility corporations. In addition, their engineering work in the industrial field has been varied and considerable. Among their important power house undertakings at the present time are the Toronto station of the Ohio River Edison Company, the completion of the Fairbanks, Alaska, power station for the U. S. Smelting, Refining & Mining Company, and the design and construction of the new Deepwater power station at Wilmington, Del., for the American Gas & Electric Company and the United Gas Improvement Company, which is to be used jointly by these companies and also to supply process steam to E. I. duPont de Nemours & Com-

B. C. Cobb

pany. This latter is the first new station to be designed for 1,200 lb. steam pressure. It has attracted national attention on this account and on account of its many other progressive design features. Stevens & Wood, Inc., of which W. H. Sawyer is president, will continue business as at present as a subsidiary company and as consulting engineers. Hodenpyl, Hardy & Company will be dissolved. Management of the companies brought together will be under the new Allied company.

Bonbright & Company, Inc., expect to offer in the near future an issue of securities of the new company.

"Give and Take" Suggested in Omaha

President Shannahan of the Omaha & Council Bluffs Street Railway has submitted to the City Council of Omaha a proposal whereby the stockholders, bondholders and the bondholders' protective committee agree that if the city will not begin an ouster suit against the company when its franchise expires on May 22 next, the company will not object to the inclusion in the new franchise of a provision that the company waive all claims and rights under past franchises and ordinances upon which is based the claim to the possession of a perpetual franchise. The new fran-

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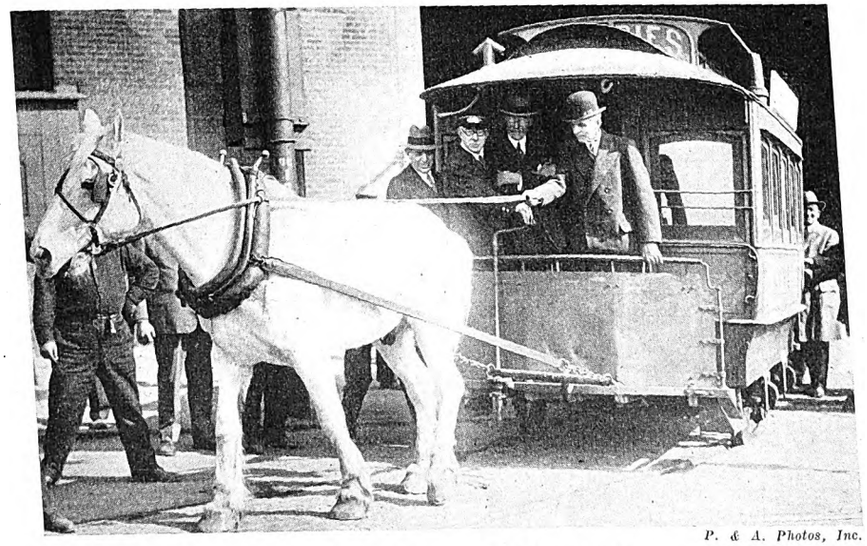
chise is scheduled for submission to the voters at the November election.

The attorneys on both sides have filed a stipulation in the federal court in the case brought by the Guardian Trust Company for the bondholders to establish the right to a perpetual franchise setting forth the agreed facts. The case will be ready for immediate submission if a new franchise is denied, and will be dismissed if a new franchise is granted.

Oldest Horse Car Presented to Henry Ford

At a rather unusual ceremony on May 8, H. Hobart Porter, president of the Brooklyn City Railroad, Brooklyn, N. Y., presented to Henry Ford for installation in his museum at Dearborn, Mich., the oldest horse car of its type in existence. After an exhaustive search by Mr. Ford's agents the Brooklyn selection was made. This car, known in its time as a "Jigger," is a one-horse model and was originally placed in service in 1868.



P. & A. Photos, Inc.

Henry Ford drives model of yesteryear

For twenty years the car was operated on the crosstown line of the Brooklyn City Railroad from Hunters' Point, Long Island City, to Erie Basin in South Brooklyn. In 1888 the car was taken from this main line and replaced by a vehicle of the two-horse type. The original car was then put into service on a route from Hunters' Point to the 34th Street Ferry at the foot of Borden Avenue. Here, under the guidance of Michael O'Connor, long since passed away, it was operated until 1897, when this route was discontinued. The car was built by the Jones Car Company, West Troy, N. Y.

An interesting feature of the ceremony on May 8 was the fact that the driver in charge of the car was James P. Gregory, who entered the service of the Brooklyn City Railroad in 1884. He long served as a driver of horse cars, and with the advent of the electric car became a motorman. He still is in the company's employ on the Flatbush Avenue Line.

H. Hobart Porter, president of the railway, in presenting the ancient vehicle to Mr. Ford said:

In 1853, at the very inception of street car transportation, the Brooklyn City Railroad was organized by the citizens of Brooklyn in order that they might enjoy this then modern method of transportation. The funds for this company were secured by a door to door sale of its $10 par value stock for $10 in cash. During the 75 years which have intervened the Brooklyn City Railroad has never been in receivership or reorganized, and many of the owners of its stock today are direct descendants of the original purchasers. During this three-quarters of a century the management of the Brooklyn City Railroad has confined itself to endeavoring to serve the public and, I believe, has a very enviable record therefor.

I have heard it said, Mr. Ford, that you are the man that made walking a pleasure and I, who have a long memory and lived some years in the past century, have always taken exception to that statement. Long before the birth of the Model "T" there was a vehicle that made walking, running or swimming even a joy. There is that vehicle, the old horse car. It served a useful purpose and was superseded. It is a mute witness of another day.

Concluding he said that as Mr. Ford had done more than any other man to modernize the transportation methods of the world, it was fitting that this well-preserved relic of urban mass transportation should be intrusted to him and in behalf of the Brooklyn City Railroad and the people of Brooklyn he turned the car over to him for his museum.

Among the prominent men invited to attend the ceremony were the Honorable James J. Byrne, president of the Borough of Brooklyn; Barron Collier, Col. W. N. Dykman, E. P. Maynard, officials of the Ford Motor Company. C. E. Morgan, vice-president and general manager of the Brooklyn City Railroad, and other officers of that company also witnessed the presentation.

Vote in St. Louis Favors Strike

A strike of the St. Louis Public Service Company's trainmen and shop workers affiliated with the Amalgamated Association seems likely. On Wednesday, May 9, the question of a strike was submitted to the workers at secret meetings. Since then it has been announced that 4,455 men voted for and 16 against a walkout unless the company recedes from its stand against the increased wages sought by the men and its intention of forcing through a lower wage schedule when the contract expires on June 2.

On May 3 the company served written notice on the union officials that it had exercised the 30-day clause of cancellation and that so far as it was concerned the contract would be a dead letter on and after June 2. The time for the strike, if one is called, is up to a special committee appointed by the union. In the meantime it is understood the union will not abandon hope of reaching a satisfactory understanding, and negotiations will continue up to the expiration of the present contract.

To date neither side to the controversy has seen fit to use a clause in the contract under which disputes as to wages, etc., may be submitted to the Missouri Public Service Commission. Mayor Victor J. Miller has declined to act unless requested to do so by one of the disputants.

The present wages of the carmen range from 50 to 67 cents an hour, the average weekly wage being $36. Shopmen under the scale asked by the union would receive an increase of 10 cents an hour and the carmen 5 cents. This would mean a total increase of $2,833,000 in the annual payroll or 28.5 per cent, the union contends. The company's answer is, the increase would total far in excess of the union's figures. In turn it has asked that wages be cut 4 to 6 cents an hour. This would save 8.27 per cent on the payrolls and total $837,000 annually. According to the company fares would have to be increased to grant the union's demands.

The decrease in the number of passengers carried in St. Louis since 1923, when the present wage scale went into effect, has reduced revenues $5,790,000.

Sam W. Greenland, manager of the company, has expressed a willingness to conduct further negotiations with the workers.

Fare Change Impends at Harrisburg

According to the *Harrisburg Patriot* the Harrisburg Railways, Harrisburg, Pa., has in mind an increase in fares. The corporation's property is being inventoried and appraised. The same authority says that several plans for an increased fare are under consideration. One is to maintain the present 6-cent fare and eliminate the transfer. Another is to retain the transfer and raise the rate to 7 cents. Still another plan provides for fare zones.

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Decision in Piedmont & Northern Case to Be Appealed

Suit is to be filed as a result of the recent refusal of the Interstate Commerce Commission to grant the Piedmont & Northern Railway permission to build a connecting link between its North Carolina and South Carolina divisions from Spartanburg to Gastonia and to extend its lines from Charlotte to Winston-Salem. At the time of the hearing of the case last summer, Mark W. Potter, New York, one of the attorneys for the company, stated that the railroad reserved the right later to question the commission's jurisdiction in such cases.

The Piedmont & Northern, through its proposed extensions, would have provided an outlet southward for the Norfolk & Western, which, with connecting lines, would have made possible formation of a new trunk line railroad to Florida. The Southern Railway, in particular, along with the Louisville & Nashville and the Seaboard Air Line, opposed the application, and the commission decided that the Piedmont & Northern was really a railway doing a general business, the only difference between it and other roads in the section being that it was operated by electricity.

Slogans in Philadelphia

Prizes have just been awarded by the Philadelphia Rapid Transit Company, Philadelphia, Pa., for three safety slogans suggested by its employees. Two winners were bus operators, the other a chemist connected with one of the power stations. The slogans follow:

The best safety device is located just above your ears. Use it.

Habits are easy to form. Make safety one of them.

Do your hesitating on the sidewalk, not in the street.

Be careful and take a look. After you have looked be careful.

"Aladdins of Industry" Distributed in Ohio

Complete and accurate information about electric railways is being put into the hands of the student generation of Ohio by a school textbook, "Aladdins of Industry," compiled by the State Committee on Public Utility Information. This book, now used by 1,152 high schools and colleges as a basis for their regular class-room work, has run into five editions, comprising 192,000 copies. All branches of public utility operation are discussed. The history of electric railways is traced, their growth pictured, present-day activities described and plans for the future discussed. Regulation, fares, taxation, cost of service and the like are treated at length.

In its study of textbooks then in use, the Ohio committee found the subject of utilities was generally confined to a chapter or less, the information often being sadly out of date.

The subject of regulation, where it was touched upon at all, stressed the need of regulation for the public's safety, but said nothing about the equally important function of protecting the utility industry's service to the public and its investors.

After due deliberation the committee decided a new book should be written that would tell the truth, the whole truth, and nothing but the truth about the utilities. The first few books off the press were sent rather diffidently to school officials with letters telling them that if the books met with their approval, and if they believed their students could use them with profit, more would be furnished free of charge. The response was very gratifying.

Progress Made Toward Changes in Toledo Operation

Representatives of the city and the Community Traction Company, Toledo, Ohio, have agreed upon major ideas in a plan for a solution of railway matters at issue in Toledo for several years. These grew out of features of the Milner service-at-cost plan that proved disappointing and the slump in car riding brought about by the tremendous gain in the number of privately owned automobiles. According to the program of Mayor Jackson, one of two suggested changes will be presented to the City Council on May 21.

Street Railway Commissioner E. L. Graumlich and David H. Goodwillie, member of the board of street railway control, had a large part in drawing up the new plan. Mr. Goodwillie is a former city service director and has served on the board during the entire six years of operation under the Milner ordinance.

The Community Traction Company will pay off a paving obligation of $185,000 plus interest, and the Toledo Edison Company will reduce the power rate as agreed upon in recent negotiations. The Doherty interests have also agreed to provide nearly $1,000,000 of new capital to finance the work of rehabilitating and extending the railway lines.

The company will also agree to purchase about 125 buses. In return the city plans to pass an ordinance which will prohibit independent bus lines from operating within a quarter mile of existing transit lines, a plan that could not be construed as monopoly under the city charter. Arrangements will be made to purchase at a fair appraisal the property of present lines which have no franchise or operating rights in the street.

Under the general plan no vote of the people will be necessary to put into effect several improvements and retain the general Milner plan.

Railway revenues have responded favorably as a result of increased employment in Toledo, and with the sinking fund requirements now eliminated, a surplus will probably be shown by the Community Traction Company each month.

Electrification Rumors About New York Central Revived

The New York Central Railroad has spent upwards of $1,000,000 making a survey to study the advisability of electrifying its entire main line from New York to Buffalo, in which work about $20,000,000 will be spent in electrifying its Buffalo terminals. This statement is attributed to William E. Robertson, vice-president of the Terminal Grade Crossings Commission, Buffalo, and vice-president of the Robertson Electric Construction Company, Buffalo.

Mr. Robertson says the information came to the commission in its negotiations with the New York Central Railroad. The announcement of reported plans of the New York Central was made by Mr. Robertson before a meeting of the Buffalo City Council in which he added that the company's lines within the city will be electrified within the next ten years. Mr. Robertson said:

The survey already completed by engineers for the New York Central indicates the electrification of the main line between Buffalo and New York will cost $350,000,000. Carrying out the plan, of course, involves the matter of financing the change from steam to electricity on about 450 miles of main line track right-of-way and is consequently a matter on which the bankers and financiers must express their approval before work actually gets under way.

Mr. Robertson says he believes the work will be started within five years and will be completed within the ten-year period.

On May 9 the New York *Times* said:

Wall Street expects an announcement soon of plans for the electrification of the New York Central Railroad main line between New York and Buffalo. It is said that the large initial cost of electrification is the main obstacle in the way of realization of such a project, and the financial district reports indicate that $100,000,000 annually would be required to be spent for three years to complete the work.

Nine Cents in Sioux City

A ten-day notice of an increase in its fares in Sioux City, Iowa, to 9 cents, with three tokens for 25 cents, effective May 10, was given recently by the Sioux City Service Company. Children's fares are 5 cents.

W. J. Bertke, vice-president and general manager, said that continuous decrease in revenue and increased taxation, necessitated the fare increase. Passenger revenue last year was $246,716 less than in 1926. Under its franchise the company is allowed a 6.5 per cent return upon its appraised valuation of $5,186,533 and the 8-cent fare, in force the last fifteen months, has failed to meet this limit. The operating return last year was $211,806 below the $337,125 permitted under the franchise. Operating revenue last year was $814,535, of which all but $6,887 came from passenger tariffs. The operating expense was $696,758.

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Recent Bus Developments

Another 25-Cent Line in Pittsburgh

Advantage was taken of the idea of direct mail advertising by the Pittsburgh Motor Coach Company, Pittsburgh, Pa., in connection with the establishment on April 23 of service on the company's fifth de luxe motor coach line, which connects the Highland Park district, a high-class residential section, with the downtown business section of Pittsburgh. The new route intersects one of the present lines in the East Liberty district, at which point transfers are issued to and received from the East Liberty line. The new route is 7 miles long. The fare is 25 cents with 21 tickets for $5.

The letter to prospective customers was signed by T. W. Noonan, general manager. It was as follows:

Commencing Monday, April 23, motor coach service will be started between downtown Pittsburgh and the Highland Park district.

The new route will operate between the East End terminal, Callowhill Street and Highland Avenue, and the downtown terminal, Liberty Avenue at Grant Street. This route will operate via Euclid and St. Clair Streets, through the Shadyside and Oakland districts to downtown Pittsburgh via the Boulevard of the Allies as indicated by the inclosed schedule.

The fare will be 25 cents one way, with tickets on sale at 21 for $5.

Transfers will be issued if you wish, to the present inbound East Liberty route (passengers to change at Penn Avenue and Highland Avenue) upon payment of regular fare, and will also be accepted from the outbound East Liberty route at Penn Avenue and Highland Avenue.

Powerful, roomy, comfortable and safe coaches are to be used, the very latest and best in motor coach design and manufacture.

Relieve yourself of the inconvenience, worry and nerve strain that always go with driving, by riding the coaches.

The motor coach company is a subsidiary of the Pittsburgh Railways.

Another Bus Purchase Reported in Washington

Purchase of the Montgomery Bus Line by the Washington Railway & Electric Company, Washington, D. C., is said to be under way. The bus line is owned and controlled entirely by citizens of Rockville. It was started some years ago as a jitney undertaking. Four buses now make thirteen round trips a day between Washington and Rockville, Md. They enter Washington via Massachusetts Avenue, and run to the bus terminal at Ninth and E Streets. Only recently the bus line obtained from the Maryland Public Service Commission the right to pick up passengers at any point along its route. Railway officials are said to have indicated that the bus service would be amplified and arrangements made for transfers to the lines of the Washington Railway & Electric Company in the city. Despite these negotiations there is said to be no intention to abandon the Georgetown-Rockville Railway. On the contrary, the company is said to plan to improve the roadbed and renovate the cars. The Washington Railway & Electric Company recently took over the privately-owned bus route to Cheverly, Md., and is improving service to that suburban community.

Would Operate in San Leandro

Certain officers of the Key System Transit Company, Oakland, Cal., have applied to the California Railroad Commission for authority to operate a bus service in the city of San Leandro. It is the intention of the applicants to transfer the said operating right to a corporation which is being organized, and will be known as the Key System-San Leandro Bus Company.

Transfer in Binghamton

The Triple Cities Bus Lines, owned by Edward A. Dorey, has been granted permission by the Endicott Board of Trustees to transfer the Binghamton-Endicott bus routes to the Binghamton Railway Bus Lines, Inc., subsidiary of the Binghamton Railway, which now leases the bus line. The railway has been operating the route for some time and now desires to purchase it. It is necessary to secure permission from the communities through which a route passes before formal application is filed with the New York Public Service Commission requesting the transfer of franchise.

Symbolic Radiator Caps in Washington

NEW radiator caps, consisting of a miniature copy of the dome of the Capitol with wings on either side and the letters "D. C." on a plate in front have made their appearance on the buses of the Washington Rapid Transit Com-Company, Washington, D. C. The device was designed by Harry Burlingame, a student at McKinley Manual Training High School, and was adjudged the best of all the designs submitted in the recent contest. The cap has been worked out in polished aluminum. The rules of the contest called for a device "symbolic of the District of Columbia as the Nation's Capital," and the winged dome was considered particularly appropriate. Incidentally, Mr. Burlingame received $100 for his suggestion.

7½-Cent Fare Suggested on Philadelphia Substitute Line

Bus operation at a 7½-cent fare rate will be attempted by the Philadelphia Rapid Transit Company, Philadelphia, Pa., for the first time under the authority of two ordinances approved by the transportation committee of the City Council. The measures contemplate substitution of bus service for trolley lines A and B, one line operating from Bethlehem Pike and Germantown Avenue to City Line and Perkiomen Avenue and the other running over Perkiomen Avenue and Hillcrest Avenue to Erdenheim. The new bus routes, X and X-1, when finally approved by the Council, also will provide free transfer privileges for interchange with electric railway route 23.

A companion ordinance, authorizing the removal of tracks from the streets where the railway service will be abandoned, also was ratified by the committee. The usual bus fare is 10 cents, with 3 cents additional for exchange privileges. Coleman Joyce, of Philadelphia Rapid Transit counsel, pointed out that the northwest service merely contemplated a substitution of buses for trolleys and that no bus route through new territory was being established, as in the northeast. The advocates of the plan said they had taken into account the fact that the Public Service Commission might decline to approve the contracts after passage by City Council on the ground that the fare was not consistent with the established charge for bus service.

St. Louis-Alton Route Sought

A permit has been asked of the Missouri Public Service Commission by the Alton Railway, a subsidiary of the East St. Louis Railway, East St. Louis, Ill., to operate buses between St. Louis and Alton. The route would cross the Missouri River and the Mississippi River on new privately owned bridges being built near Fort Bellefontaine and Alton. The granting of the permit by the Missouri Public Service Commission will enable the Alton Railway to place in service on this new route the de luxe Blue Goose Motor Coaches.

Extension of Coach Route in Los Angeles Desired

The Los Angeles Railway and the Pacific Electric Railway have filed a joint application with the California Railroad Commission for permission to extend their Sunset Boulevard motor coach line. Permission is also asked to increase the one-way fare to 15 cents, to apply between Fifth and Hill Streets and Sunset Boulevard and Crescent Heights Boulevard; one-way fare between Fifth and Hill Streets and Sunset Boulevard and Western Avenue, 10 cents; one-way fare between Sunset Boulevard and Crescent Heights Boulevard and First Street and Vermont Avenue, 10 cents.

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Commission Powerless to Act in New York-Canada Case

The Public Service Commission of New York has decided that it is without authority to entertain the petition by Melville L. Van Dyke for a certificate covering operation of a bus line from Shelton Square over certain streets in Buffalo as a part of a line to Fort Erie and Bridgeburg, Canada. A memorandum by Commissioner Pooley says:

From the cases considered by the United States Supreme Court and the courts of this state it appears that while bus operators, engaged exclusively in interstate business, are subject to regulation by the state to insure safety and convenience and the conservation of the highways and may be required to contribute to their cost and upkeep, they are not required to obtain either a consent from the local authorities or a certificate of convenience and necessity from the commission.

Van Dyke has been operating under a revocable consent by the city of Buffalo. The International Railway contended that it now afforded adequate service to the Peace Bridge and that operations by Van Dyke from Shelton Square would deprive it of revenue.

Boston-Lowell Route License Sought

The Eastern Massachusetts Street Railway, after an attempt to establish bus service between Boston and Lowell, Mass., has again applied for a license to operate this service. If permitted the proposed route will function via Cambridge, Arlington, Winchester, Woburn, Burlington, Billerica, Chelmsford and thence to Lowell. Trustees of the company announce that the plan is a restoration of a service rendered by the railway from Oct. 1, 1924, to May 1, 1925, but withdrawn at the request of the Boston & Maine.

Fred A. Cummings, vice-president of the Eastern Massachusetts, said that when the foundation for this route was laid four years ago the Boston & Maine made no protest although public hearings were held in each place; that his company invested $200,000 in motor coaches but the Boston & Maine Railroad protested that the route was cutting into the railroad's revenues between Lowell and Boston. He declared that, in the public interest, his company is willing to join with the steam road in a joint operation between Boston and Lowell on equal terms.

Would Make Substitution on California Line

The Pacific Electric Railway, Los Angeles, has applied to the California Railroad Commission for authority to abandon service and remove its tracks on its Upland-Ontario line in the city of Ontario. A certificate of public convenience and necessity for the operation of a motor coach line between the cities of Upland and Ontario in place of the present railway service is sought.

Financial *and* Corporate

Segregation of Indianapolis & Cincinnati Properties Proposed

Two new corporations will be formed out of the property of the Indianapolis & Cincinnati Traction Company to serve the central southeastern part of Indiana. Charles T. De Hore and Leroy E. Eastman, purchasers of the railway at foreclosure, are reported to be planning to spend more than $425,000 in the development of the property.

A company to be named the Indianapolis & Southeastern Railway will be formed, subject to the approval of the Public Service Commission, through the combination of two divisions of railway lines running, respectively, from Indianapolis to Rushville and Connersville, and to Shelbyville and Greenburg.

The second company, to be called the Southeastern Indiana Power Company, will be formed by the combination of power distribution business in twenty communities and towns with five small power companies serving twelve other towns in adjacent territory which had been bought in recently by Messrs. De Hore and Eastman.

Approval of $1,000,000 Increase in Bonds Sought

A special meeting of the stockholders of Monongahela Street Railway, Pittsburgh, Pa., has been called to convene on May 29 for the purpose of approving of the proposed increase of the indebtedness of the company from $4,400,000 to $5,400,000 to provide funds to take up, pay off and discharge the first mortgage 5 per cent 30-year gold bonds of the company, dated June 1, 1898, and maturing June 1, 1928, consisting of an original issue of bonds in the face amount of $1,000,000. The Monongahela Street Railway is included in the system of the Pittsburgh Railways.

Connecticut Company Sells Millerton Electric

The Central Hudson Gas & Electric Corporation, Poughkeepsie, N. Y., has applied to the Public Service Commission for authority to acquire the outstanding capital stock of the Millerton Electric Light Company, serving Millerton and the town of Northeast, and for approval of the merger of the Millerton Company with the Central Hudson Gas & Electric Corporation. The petition states that the capital stock of the Millerton company is owned by the Connecticut Company. It is planned to purchase the Millerton company's stock from the Connecticut Company and also to purchase a transmission line in Northeast forming part of a transmission line between Poughkeepsie and Falls Village, Conn., which connects the Central Hudson Company and the Connecticut Company, for $105,000 in cash and issuance to Connecticut Company of 2,000 shares of the no-par common stock of the Central Hudson Company. The Millerton and the Poughkeepsie companies serve adjacent territories.

Operating Profit on Michigan Suburban Line

The United Suburban Railway, the "shortest electric railroad with the longest list of stockholders in the United States," held its first annual meeting recently and reported an operating profit of $2,950 at the close of its first seven months of service. This report covers operations from July 22, 1927, to Feb. 29, 1928, of the company, which leased the right-of-way of the Holland division of the Michigan Railways when that division discontinued operations on Nov. 17, 1926. It now operates its line from Grand Rapids to Jenison, 9 miles, with a 25-minute service. The stock in the company is held by the residents in the villages and along the right-of-way that the road serves.

No cash dividends were declared at the annual meeting but President E. F. McCarrick said he hoped that in a year the company would be in a position to pay a cash dividend on the investment.

Secretary Slaght reported that Grand Rapids banks, with faith in the project, had loaned the new company $12,500 to start operations and that these loans had been reduced to $9,000. Further, with $7,450 soon to be available on unpaid pledges for stock the company would almost be in a position to pay off its indebtedness at the banks. His report showed the company collected $27,198 in fares and $500 income from all other sources during the first seven months. Operating expenses were $24,747, and for repairs and maintenance $2,566 was spent. The company's net worth on Feb. 29, 1928, was $50,399.

Improvement in industrial conditions in Grand Rapids explained the satisfactory earnings in January and February. The construction of 40 modern homes along the interurban line in 1927 is a major development to the credit of the interurban company. The contractors decided to build these houses after the interurban line became a certainty. Many other homes have been erected in the suburban territory since the line resumed operations, giving fifteen-minute rush-hour service and 25-minute shopper service.

The suburban company has one competitor, the Andringa & Datema Bus Line, Inc., which made an offer in writing to the annual meeting to sell its franchise and equipment to the railroad for $57,000. Stockholders of the railroad were only lukewarm toward the bus proposal, but a committee was appointed by President McCarrick to investigate.

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Ohio Interurban Makes Good Showing

Both passenger and freight service developed intensively. Many obstacles overcome in first full year of operation of the Cincinnati, Hamilton & Dayton Railway

TRAFFIC and revenues of the Cincinnati, Hamilton & Dayton Railway, Dayton, Ohio, were adversely affected during the year by the general economic situation in the territory in which it operated. Beginning in March, 1927, a marked reduction in the volume of employment and output of the manufacturing enterprises in the Miami Valley, as elsewhere in the United States, was evident and became more pronounced as the year advanced. The tonnage shipments of the manufacturing enterprises were reduced in proportion substantially like the reduction in the man-hours worked; the volume of passenger traffic moving between points in the Miami Valley was also adversely affected. In Hamilton the reduction in the volume of employment was unusually severe, due, in part, to the partial shut-down of the plant of the Ford Motor Company throughout the greater part of the year. The total man-hours paid for by the larger manufacturers in Hamilton in 1927 were 81.5 per cent of those in 1926. Under these conditions travel decreased on local lines in Hamilton, the revenues being 6.1 per cent below those in 1926.

The results of operation during the year 1927 (the first full year of operation by the company) are as follows:

CINCINNATI, HAMILTON & DAYTON OPERATING RESULTS

Gross revenue from railway operation	$1,065,056
Operating expenses including maintenance, rentals, general taxes and general interest	934,358
Net operating revenue	$130,697
Other income	2,270
Total income	$132,968
Interest on bonds	*63,846
Balance available for depreciation and surplus	$69,121
Appropriation to renewal and replacement reserve	45,600
Balance transferred to surplus	$23,521

*After deducting credit for interest during construction—$16,466.

Despite this situation the passenger revenues of the interurban line in 1927 were 2.1 per cent in excess of those in the preceding year, while the total tons of freight handled in 1927 were 26.2 per cent in excess of the tonnage handled in 1926 and the freight revenues were 23.2 per cent greater in 1927 than in 1926.

Naturally it is a matter of gratification to the management that in the face of the economic conditions which prevailed during 1927 the gross revenues from operation of the entire property were 4.9 per cent greater than in 1926.

During the year 1927 the company secured the privilege of participation in the joint freight tariffs promulgated by the Central Freight Association, making possible better service to the manufacturers and shippers of the Miami Valley and the development of traffic which theretofore could not be attracted.

On Aug. 1, 1927, the company established a freight receiving station in the Cincinnati Terminal Warehouse in the heart of the wholesale district of Cincinnati. Prior thereto the only freight terminal which the company possessed in Cincinnati was at Cumminsville at the southern terminus of the interurban line, approximately 5 miles from the center of Cincinnati. The new downtown freight station attracted a large volume of business not previously obtainable which has steadily increased from month to month. Freight is transferred between the downtown terminal and Cumminsville by truck.

On Feb. 1, 1927, Richard Breckinridge was elected vice-president in charge of traffic. Under his direction the traffic department was enlarged substantially and the work of actively building up and soliciting traffic has been prosecuted vigorously. The results secured are reflected in the remarkable development of the freight tonnage and revenues in the face of a period of industrial depression.

Traffic Responds to New Rolling Stock

On May 6, 1927, the company introduced new modern de luxe suburban type equipment on its Dayton city lines and at the same time increased the frequency of service on these lines approximately 25 per cent. As a result of this improved service and a vigorous publicity policy a very substantial and immediate increase in traffic on these lines was enjoyed while, at the same time, a marked reduction in operating expenses was effected. Similar cars, operated by one man, were introduced on July 15 into the local service between Dayton and Miamisburg. The total number of revenue passengers carried on the Dayton City-Dayton-Miamisburg lines was 14.6 per cent greater in 1927 than in the preceding year. On June 26 new interurban passenger equipment was placed in service on the interurban line between Dayton and Cincinnati. On the same day a local half-hour service was established between Hamilton and Cincinnati. This materially increased the volume of business carried between these cities.

On July 25 eight new automatic substations, embodying the latest features of construction were placed in operation. Their aggregate rated capacity was 3,800 kw. The old, obsolete and relatively inefficient 25-cycle substations were shortly thereafter dismantled and the equipment sold. During the first five months of 1927 the company generated 4,673,683 kw.-hr. at an average cost of 1.680 cents per kilowatt-hour. During the last five months, in which the new substations were in operation and power was secured entirely from the Union Gas & Electric System, the company purchased 4,139,901 kw.-hr. at an average cost of 1.180 cents per kilowatt-hour. During June and July, in which a portion of the power used was generated and a portion thereof purchased, the total kilowatt-hours purchased and generated were 1,701,206 at an average cost of 1.798 cents per kilowatt-hour. The average consumption per car-mile was 3.70 kw.-hr. in 1927 compared with 4.35 kw.-hr. in 1926.

Most Modern Shops of Their Kind

The main car shops at the time of the organization of the company were situated at O'Neils, about 5 miles south of Dayton. These shops were of inadequate capacity and were most poorly equipped as regards machine tools and other labor-saving devices. After much consideration the company purchased two large, modern steel and concrete shops and approximately 12 acres of ground on the main-line tracks at Moraine City, together with a full equipment of machine tools. Title to these shops was acquired on April 23. Immediately thereafter the work of installing tracks and making other changes necessary to fit them for their new uses was undertaken. On Aug. 15 the O'Neils shops were abandoned and the shop forces transferred to the new Moraine shops. The old car shops at O'Neils, and approximately 10 acres were sold upon advantageous terms. As a result the company now possesses what are probably the most modern car shops of any interurban in the United States.

Additions and betterments aggregating $1,424,306 were made as follows:

ADDITIONS AND BETTERMENTS OF CINCINNATI, HAMILTON & DAYTON

Paved track reconstruction in Hamilton	$49,272
Other track construction and reconstruction	19,309
Telephone and distribution system reconstruction	6,887
Construction and reconstruction of stations and miscellaneous buildings	6,863
Roadway equipment and automobiles	9,310
New freight facilities at Hamilton, Cumminsville, etc	11,917
Eight new 60-cycle substations, including buildings, equipment, land, etc	176,432
Purchase and equipping new Moraine shops and offices, including yard tracks, and additions to Hamilton shops	569,647
Purchase of ten interurban cars, ten suburban-type cars, one freight motor, 25 freight box cars, reconstruction of certain Hamilton City equipment, etc	546,780
Miscellaneous items	16,142
Interest during construction	11,747
	$1,424,306

During the year the company sold $500,000 par value of its first and refunding mortgage 6 per cent gold bonds, due 1941, at par and accrued interest to the reorganization managers as provided in the plan and agreement of reorganization. The company also sold upon favorable terms an issue of $450,000 par value of equipment trust certificates, issued under the so-called Philadelphia Plan, due serially from Oct. 1, 1927, to April 1, 1937, the proceeds being used to pay in part the cost of the new passenger and freight equipment.

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In this connection it should be explained that the Cincinnati, Hamilton & Dayton Corporation is a holding company owning all of the common stock (except directors' qualifying shares) of the Cincinnati, Hamilton & Dayton Railway.

No dividends have been declared or received on the stock of the railway owned by this corporation, and hence

CINCINNATI, HAMILTON & DAYTON CORPORATION AS OF DEC. 31, 1927

Assets:		
Cash		$10,075
Investments		3,599,460
Incorporation expense		16,093
		$3,625,628
Liabilities:		
Prior debenture bonds due 1976		$2,135,000
Adjustment income bonds due 1976	$875,000	
Less treasury bonds	26,250	848,750
Surplus—represented by 24,500 shares of no-par common stock of which, 105 shares are held in the treasury		651,878
		$3,625,628

Note—In the item "cash" is included the balance remaining in the hands of the reorganization managers otherwise unappropriated which upon the completion of the work of the managers is to be delivered to the corporation for its general corporate purposes.

no interest has been declared payable upon the debenture bonds or on the adjustment income bonds of the corporation. Under the provisions of the indentures securing the bond issues the coupons maturing prior to Jan. 1, 1930, are void in the absence of affirmative action prior to the maturity dates thereof by the board of directors declaring the payment of interest thereon.

The reorganization managers, constituted under a certain plan and agreement of reorganization for the railway property of the Cincinnati & Dayton Traction Company, dated Oct. 1, 1925, practically completed their work before the close of the year but were not able to wind up their affairs and file their final accounts with the Wilmington Trust Company, Wilmington, Del., reorganization depositary, prior to the close of the year. Under the plan and agreement of reorganization any balance remaining otherwise unappropriated is to be delivered by the managers to the corporation for its general corporate purposes and any securities of the corporation remaining in the hands of the managers, free from liens or other charges, are to be assigned and delivered to the corporation to be held by it as treasury securities.

Shelburne Falls Road Sold

Michael J. Brophy has sold at public auction for the trustees of the Shelburne Falls & Colrain Street Railway, Shelburne Falls, Mass., all the real estate, consisting of office buildings, power houses, machine shops, carhouses and rights-of-way belonging to the company, located in the towns of Shelburne Falls, Colrain and Buckland, to Carleton P. Davenport, Shelburne Falls. In addition Mr. Davenport also purchased all of the personal property, tracks, cars and other equipment of the railway.

Sault Ste. Marie Buys Line

The Sault Ste. Marie Traction Company, Sault Ste. Marie, Mich., became a community enterprise on May 1. The new owners, mainly business interests, industrial interests and working men, hope that the road can be made self-sustaining. According to the secretary there will probably be about 400 stockholders, of whom 250 will each hold one $10 share. The former owners of the Sault Ste. Marie Traction Company, the Algoma Steel Corporation and Lake Superior Corporation, planned to suspend service, but realizing that it would be detrimental both to the business and industrial interests of the community to stop the service, these companies sold the road at its scrap value to the community. The system comprised 7 miles of track.

Muskegon Interurban Out of Business

The Grand Rapids, Grand Haven & Muskegon Railway, serving a territory in Muskegon County and northern Ottawa County out of Grand Rapids, Mich., ceased operations April 18. For 27 years this company transported thousands of citizens between the ten cities and villages along its lines and hundreds of thousands to the Lake Michigan beaches in the Ottawa and Muskegon country regions.

The death knell of the Muskegon interurban was sounded when Federal Judge Fred M. Raymond in United States District Court in Grand Rapids signed an order on March 24 ending the life of the railway on petition of the Guaranty Trust Company, New York. This petition asked that the Grand Rapids Trust Company, which had been receiver since July 31, 1926, be authorized to end its endeavors to put the road back on a paying basis. The Guaranty Trust Company was trustee for holders of $1,500,000 in bonds upon which interest amounting to $75,000 annually had been defaulted for a year prior to the receivership.

A report showed that on July 31, 1927, the close of the first year under the receivership, the interurban lost $24,768, not including the interest on the bonds, and that these losses had multiplied during 1928 in spite of a valiant fight to avoid further deficits. Receiver's certificates amounting to $30,000 had been issued to provide operating and other expenses up to the time the company ceased operations. More than $20,000 is owed to the state of Michigan and counties through which the road operated.

Since the interurban company ceased operations its bus line has been more or less in public print. First, O. W. Hess, engineer of the Kent County Road Commission, proposed conversion of the interurban's right-of-way into a wider US16 trunk line where the railway now runs close to the highway. This recommendation is now being considered by the Highway Commission. Then the Greyhound bus line petitioned for a franchise for its buses to operate on a route paralleling the old interurban line. Previously the interurban company had blocked this petition by supplementing its car service with rapid bus service on an hourly schedule. Finally, three applications were made to the State Utilities Commission for permission to operate freight-bearing motor vehicle lines connecting Grand Rapids, Grand Haven, Muskegon and Holland by the receivers for the Michigan Electric Railway, the Star Transfer Company of Grand Rapids and William Bronsema, Grand Rapids. The Grand Rapids Trust Company, receivers for the Muskegon interurban, opposed the petitions pending a deal whereby the Greyhounds might purchase the bus line service of the Muskegon company. Recently the deal was closed by the Public Utility Commission order whereby the Greyhound lines take over the buses and route of the interurban company known as the Lake Line Company. New schedules went into effect on May 7. They call for hourly service both ways.

$38,000,000 Spent in Boston

There was expended by the trustees of the Boston Elevated Railway, Boston, Mass., between July 1, 1918, and Dec. 31, 1927, upon road and equipment, about $38,375,000 as follows:

Cars and buses	$18,779,000
Carhouses, shops and garages	6,288,000
Power houses and transmission of electricity	4,587,000
Surface lines (track and line betterment)	5,350,000
Elevated structures and appurtenances	2,128,000
Miscellaneous improvements	1,243,000
Total	$38,375,000

When added to the total of $3,434,000 which had been expended upon road and equipment in excess of any capital issues at the time the trustees took charge of the railway property on July 1, 1918, it made a total of about $42,000,000 to be provided for during the first 9½ years of public control. The sources were:

Part of the proceeds from the sale of preferred stock which the stockholders were compelled to subscribe before the public control act could take effect	$2,000,000
Proceeds from the sale of the Cambridge subway to the Commonwealth	7,868,000
Available from the depreciation charge July 1, 1918, to Dec. 31, 1927	21,680,000
Approximate amount received in settlement of fire insurance losses	1,000,000
The approximate cash proceeds resulting from the sale of real estate properties	1,850,000
Additional bonds issued against the preferred stock which was sold under provisions of the public control act	3,000,000
Additional Boston Elevated bonds issued Feb. 1, 1927	1,926,000
Capital provided to Dec. 31, 1927	$39,324,000

Illinois Line Purchased

The electric railway lines of the Central Illinois Public Service Company running from the Southern Illinois State Hospital, Anna, to the tracks of the Illinois Central Railroad at Anna, were purchased recently by the Anna-Jonesboro Railroad. The price paid was $134,399.

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Book Reviews

Transit and Transportation

By H. M. Lewis with supplementary reports by W. J. Wilgus and Daniel L. Turner. Published by Regional Plan of New York and Its Environs, Volume 4, New York, N. Y. 226 pages.

Regional survey Vol. 4 is a sequel to that on traffic. Under the transit problem present conditions are discussed, the systems in New York City and in the suburban territory are described and an explanation is made of the relation of buses and surface transit lines to the rapid transit system. Under the transportation problem are included the railroad system, the waterway system and the airway system.

Part two of Volume 4 covers a study of port and industrial areas and the possibilities of the Hackensack Meadows.

In this volume Mr. Lewis has completed an interesting and valuable diagnosis of existing conditions. The supplementary reports of William J. Wilgus and D. L. Turner embrace a study of transportation in the New York region and the requirements of New York City rapid transit. The volume contains many maps, charts and diagrams.

The report presents the findings and conclusions of a large corps of experts in the fields of economic research, engineering and community planning, who have for six years conducted an intensive study of the situation in New York City and its 400 neighboring cities and villages, preliminary to the drafting of a plan for the future development of this city and the suburbs linked with it economically. It analyzes the plans contemplated or in process of execution for increasing the rapid transit facilities of northern New Jersey, Westchester County and Long Island. A conclusion is drawn that additional facilities should be planned to encourage a better balanced distribution of industry and population.

Bills of Lading

By Ernest W. Hotchkiss, LL.B. The Ronald Press Company, New York, N. Y. 287 pages. Price, $5.

As Mr. Hotchkiss defines it, a bill of lading is a written acknowledgement of the receipt of personal property and a contract to transport and deliver it, at a certain place, to a certain person or his order, and when to order, is a document of title, acceptable for credit. It has four functions because it is: (1) a receipt; (2) a contract, and when made to order (3) a document of credit, and (4) an instrument of credit. Transportation contracts are of such vital importance to corporation executives, traffic managers, railroad officials, bankers, lawyers and shippers generally that a need exists for a statement of the present laws pertaining to bills of lading. "Bills of Lading" is an attempt to supply that need by bringing together references to related statutes concerning bills of lading; decisions of courts; forms, regulations, and rules as published in the tariff structures of the carriers and approved by the Interstate Commerce Commission, all of which becomes a part of the contract of shipment within the federal transportation act. In addition to a table of cases cited, given in the early part of the volume, considerable material, with forms of the several bills of lading, and structures concerning them, has been included in appendices for convenient reference.

Electric Traction on Italian Railways

(La Trazione elettrica sulle ferrovie Italiane). Published by the Minister of Railways and Communication in connection with the Volta Centenary in 1927. Board covers, illustrated. 194 pages and 2 large maps.

In a country like Italy, where coal is expensive but waterpowers are abundant, it is not surprising that a great deal of attention should have been paid to railway electrification. In fact, in many forms of railway electrification, Italy was a pioneer. Thus, the Milan-Varese third rail direct-current road, installed in 1901 and 1902, was one of the most important of its kind up to that time, and the Lecco-Sondrio-Colico three-phase railway, built in 1902, was the pioneer of three-phase operation on a large scale. Up to Sept. 1, 1927, there had been built and put into operation by the Italian government heavy electric traction lines comprising 1,149.8 km. (718.5 miles) of route and 2,399 km. (1,499 miles) of track, and there was in course of equipment 257 km. (161 miles) of route and 744 km. (465 miles) of track. These lines in course of construction included the Foggia-Benevento line to be operated with 3,000 volts direct-current, and the Rome-Sulmona line to be equipped with 10,000-volt three-phase.

These figures, with a great deal of other very interesting information, are contained in a book recently issued by the Minister of Railways and Communication of the Italian government. It is divided into five sections as follows: General statistics and discussion; detailed information of the electrical equipment and distribution system of each of the lines of the State railway system; data on the sources of electric power supply; detailed information of the electrical locomotives; brief information in regard to 33 interurban electric railways not forming part of the State railway system. These lines have a total length of 1,005 km. (628 miles).

The book is very well illustrated, among the prints being two large maps. One shows all of the interurban and trunk electric railway lines in Italy. The other is on a larger scale and shows the electrified lines in the Milan-Genoa-Leghorn District, with their transmission lines.

Aladdin, U. S. A.

By Ernest Greenwood. Harper & Brothers, New York, N. Y. 265 pages. Price, $2.50.

It was an ambitious task upon which Mr. Greenwood entered—that of attempting to set forth as briefly as possible something of the history and development of the spirit of electricity, together with its social, industrial and political implications and the tremendous change which it has brought about in our daily lives. He has succeeded to a degree that might at first seem improbable. To keep it within the boundaries of reasonable length, the book has, of course, been confined to the barest outline of the contribution made by applied electricity to the social and material welfare of the nation, but the choices which the author has made are judicious and the balance of the subjects is well preserved. This is all the more praiseworthy since it is apparent that each chapter might easily be developed into a number of volumes. There is some history, but not too much. There are some economics, but not too much. There is some technology, but not too much.

The foreword is by Thomas A. Edison. He says that despite the fact progress has been so rapid we may require a breathing spell in which to consolidate our gains, the electrical development of America is only well begun. If this statement needed to be borne out, Mr. Greenwood has done it in his own text. It is not always easy to agree with the appraisal on the jacket of a book, but in this case the text bears out the statement that Mr. Greenwood has written a fascinating record of the wonderful accomplishments of electricity and of the way it has contributed to American progress and prosperity.

American Electric Railway Association Proceedings for 1927

Published by American Electric Railway Association, 292 Madison Avenue, New York, N. Y.

The 1927 Proceedings contain a complete report of the twentieth annual convention held at the Public Auditorium, Cleveland, Ohio, from Oct. 3-7, 1927. Five volumes have been issued covering the work of the American Association and its affiliated bodies, the Transportation and Traffic Association; Claims Association; Accountants Association and Engineering Association.

500 Representative Public Utility Advertisements

Public Utilities Advertising Association, Jackson, Mich. Single copies $10. In quantities of five or more, $7.50 each.

The 1928 edition of the compilation issued annually under the above title is ready for distribution. The book is published by the Public Utilities Advertising Association, of which Donald M. Mackie, Jackson, Mich., is president this year. This is a collection of utility advertisements selected from among thousands submitted, by a competent committee.

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Personal Items

A. E. Reynolds Heads Missouri Association

A. E. Reynolds, vice-president and general manager of the Springfield Traction Company, Springfield, Mo., was elected president of the Missouri Association of Public Utilities at the 22nd convention, held in Jefferson City, Mo., April 26-28. In 1926 Mr. Reynolds was elected to the presidency of the Midwest Electric Railway Association. This new honor adds something more to the active career of a man who has been identified with public utilities for many years. Before going to Springfield in 1923, Mr. Reynolds had been general manager of the United Traction Company, Albany, N. Y., and the Hudson Valley Railway, Glens Falls, N. Y. A review of his career was published in ELECTRIC RAILWAY JOURNAL, issue of July 24, 1926.

A. V. Bennett Vice-President of West Penn Power

A. V. Bennett, connected with the West Penn System, Pittsburgh, Pa., since 1918, has been elected vice-president of the West Penn Power Company. Before he entered the service of the West Penn, Mr. Bennett was associated with the American Water Works & Electric Company, Inc., as assistant superintendent of the Birmingham Water Works Company, Birmingham, Ala., and later as superintendent of the Arkansas Water Company at Little Rock, Ark. In 1918 he was transferred to the Pittsburgh office of the West Penn System as assistant to the president, later being made vice-president of the coal companies and several other subsidiaries.

H. G. M'Eldowney Added to G. E. Directorate

Henry C. McEldowney, president of the Union Savings Bank and the Union Trust Company, both of Pittsburgh, was elected a director of the General Electric Company at the organization meeting of the board held at Schenectady on May 8.

The stockholders, at their annual meeting, authorized the additional director, increasing the total from twenty to twenty-one. Other directors were re-elected. Mr. McEldowney is a director of the Mellon National Bank of Pittsburgh and of the Pittsburgh Chamber of Commerce. All other officers of the company were re-elected.

At noon on the day of the meeting, in the presence of 20,000 employees of the company and directors, a bronze tablet honoring the memory of Charles A. Coffin, founder of the company, was unveiled by Miss Alice Coffin, a daughter. At this ceremony, Owen D. Young, chairman of the board, presided and the principal address was by E. W. Rice, jr., honorary chairman of the board and one of the oldest living associates of Mr. Coffin.

Changes on Sacramento Northern

Changes in the personnel of the Sacramento Northern Railway, San Francisco, Cal., are as follows:

Charles Elsey is now serving as vice-president; W. G. Bruen, secretary; D. C. DeGraff, auditor. J. R. Parke was formerly secretary and auditor. H. K. Faye is freight traffic manager and Bode K. Smith passenger traffic manager. These duties were formerly performed by R. D. Williams with the title of traffic manager.

ARTHUR J. METZDORF has been made manager of the Wildwood Amusement Park of the Twin City Lines on White Bear Lake east of St. Paul on the Stillwater suburban railway line, succeeding his father, the late P. J. Metzdorf. He has been a supervisor for the St. Paul City Railway.

Obituary

Edward W. Moore

Edward W. Moore, builder of city railways and pioneer in the promotion of interurban electric railways, died on May 8 at his home in Cleveland, Ohio, after a long illness. Mr. Moore had been identified with electric transportation in Cleveland and northern Ohio since electricity replaced the horse as motive power on city railways. He relinquished his last active electric railway connection when he retired from the presidency of the Lake Shore Electric Company several years ago.

Mr. Moore's connection with electric railway finance started in 1889, when he purchased stock of the East Cleveland Railroad. In 1891 he was a member of a syndicate which purchased and re-equipped the Wheeling Traction Company and another syndicate which bought the Toronto Railway and changed it from horse to electric power. Three years later the Everett-Moore syndicate built the Akron-Cleveland & Bedford interurban line, which later obtained control of the railways and the power and light plants in Akron and Cuyahoga Falls. These properties were the nucleus out of which later was evolved the Northern Ohio Power & Light Company.

In 1898 the Everett-Moore syndicate obtained control of the Cleveland Electric Railway, comprised of most of the independent lines in Cleveland, and operated it until the Tayler grant became effective in 1910. During this period Mr. Moore and his associates, among them the late John L. Stanley, went through one of the trying periods of railway history in Cleveland in which the late Tom L. Johnson as Mayor was one of the participants. The Everett-Moore syndicate built the Cleveland, Painesville & Eastern Railway, which recently passed out of existence, and the Lake Shore Electric Railway. After his retirement from the presidency of the London Street Railway, London, Ont., he gave his attention to these properties and to the Detroit United Railway, of which he was vice-president for many years.

In addition to his interurban activity he also promoted nine independent telephone companies in Ohio.

Mr. Moore was born at Canal Dover, Ohio, 64 years ago. He is survived by his wife, a son and three daughters.

Paul T. Brady

Paul T. Brady, special representative in New York of the Westinghouse Electric & Manufacturing Company, with which he had been associated for 34 years, died suddenly on May 3 in Portland, Ore. He was 71 years old.

Mr. Brady was one of the pioneers of the electric light and power industry. Combining technical electrical knowledge with financial ability, he has left behind him more than a score of successful electrical systems. New York State owes to him much of its telephone system, electric power and electric railways. His work in Georgia, West Virginia and Alabama is of great economic value to those states. In spite of his years he was actively engaged in development work up to the very last day of his life.

After he was graduated from Phillips Exeter Academy Mr. Brady taught school for a brief period. Since 1881 he had been engaged in various branches of the electrical industry. In the Eighties he was with the American Telephone & Telegraph Company and helped the telephone system through the southeastern portion of New York State, also building some of the first electric light plants in this territory. In 1890 he joined the Thomson-Houston organization and became its manager for that state and the Middle West.

In 1894 Mr. Brady was appointed New York State manager for the Westinghouse concern, with headquarters at Syracuse. In 1907 he was transferred to this city as special representative.

Among the public utilities which Mr. Brady founded, reorganized or helped to develop, are the Rochester Railways, Rochester Gas & Electric Company, Niagara, Lockport & Ontario Power Company, Central Georgia Power Company, Virginia Power Company, Missouri River Power Company and Southeastern Light & Power Company. He brought into operation the 60,000-volt long-distance transmission line to carry power from Niagara Falls to Syracuse.

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Manufactures *and the* Markets

Foreign Trade Combinations Can Be Made Valuable

Foreign business concerns have made great progress in consolidated trade effort. Exporters in this country should meet competition on even terms

CLEARLY the day of integrated mass trade effort, as a counterpart of mass production, is at hand, according to Dr. Julius Klein, director of the Bureau of Foreign and Domestic Commerce, in his address before the sixteenth annual meeting of the Chamber of Commerce of the United States, a report which is published elsewhere in this issue. The situation calls for sober factual analysis, calm planning, and courageous action; there is no room for emotional patrioteering on the one hand or supine defeatist submission on the other.

It was hoped that in the Webb-Pomerene combines had been found the answer to foreign collaborative competition, but the last decade of the operation of that act has revealed some unexpected obstacles to its complete success. Although some 57 export associations are now registered under it, only a small proportion of these are actively operating. Their total export trade in the last fiscal year was about $200,000,000, a third of which was supplied by metals and minerals, another third by forest and food products, and the remainder by miscellaneous manufactures and partly processed goods. The bulk of the commodities, the traders in which avail themselves of the privileges of the act, were raw materials. They seemed to fit more easily into the scheme through the convenience of establishing uniform standardized documents, accounting methods, inspection and grading, allocation of cost quotas, and prorating of good will and other intangible assets.

Germany has led in the movement of consolidated international trade effort for two reasons: (1) more than 2,000 cartels and similar market and production agreements have thrived on her soil; and (2) she is dependent to an unusual degree on the restoration of unrestricted commerce on the Continent, where 75 per cent of her exports are now marketed, partly because of the loss of her colonies. In Austria some 65 corporations have consolidated in the past two years, several being "vertical" mergers linking the successive independent units of the given industry from raw materials through to finished production, along lines quite similar to those followed in the United States.

The experimental period of these post-war undertakings has scarcely gone far enough to warrant definite deductions as to their actual achievement in cutting costs, and in more effective marketing operations. There is clearly an inclination in some European quarters to count too much on the economies of mass production—to over-play the "mass mania," which has been evident in so many of our own plants, not always with sound profit-making justification.

As a protection against consolidated selling, there is also much discussion regarding the possibility of consolidated buying. The Newton bill, recently defeated in Congress, proposed such a device, and somewhat similar measures and practices have been in use for years in other countries, notably in such lines as bauxite, vegetable oils, zinc, manganese and iodine. In the case of the American rubber import trade the principle has already been applied with considerable effect. It contributed very materially toward the collapse of the attempted producers' control.

Doleful observations have been made that, by proposing to authorize such temporary import defensive measures, we were simply indulging in the same form of criminality which we were condemning in foreign export circles. Careful comparisons, however, of the two projects—collaborative buying and selling—reveals them as being of diametrically opposite type and purpose. In the minds of these critics who denounce any defensive spirit on the part of American consumers, apparently the only response which we should make is that of complete passive submission. However vicious and unscrupulous the operations of the given foreign combine might be (and there has been more than one episode of just such rapacity in recent years), we should under no circumstances meet aggression with aggression, so we are told, but rather should we undertake to reason with our assailants, to point out the error of their ways, and to dispel their dark intentions by the force of economic logic! In the presence of the burly realities of the trade rivalries and acquisitive aspirations of today, such amiable academic sophistry is nothing but solemn nonsense. The best defense on the part of the consumers, and the only honorable one, is through co-ordinated action under such proper restraints as are necessary in behalf of the general public interest.

The experience of some 2,000 trade associations in the United States offers abundant reasons for assuming large opportunities in internationalized trade collaborative effort. It is to be hoped, for example, that early headway will be made toward interchange of credit information among foreign traders throughout the world. There is a large field for consumer education on the part of many world trades. The need for collaboration in the furthering of uniform commercial legislation, for the interchange of statistical information along mutually helpful lines, for such valuable propaganda as highway education in behalf of automotive trades—along all of these and a hundred other lines are there abundant needs for combined effort in advancing the standards and possibilities of the world's commerce.

Exhibitograph No. 8

NEWS

UNEMPLOYMENT
POOR BUSINESS
PRESIDENTIAL CAMPAIGN
NERVOUS STOCK MARKET

STILL

after space applications for the A.E.R.A. show had been in the mail less than four weeks, requests had been received from 153 exhibitors for 87,601 square feet of space.

The Convention

is STILL nearly five months off. Notwithstanding all the scare headlines the wide awake, solid, substantial, manufacturer STILL has both feet on the ground and is showing the industry that he is carrying on as he has for years with the National Association, realizing the truth of the old saying

Bread cast upon the waters returns a hundred-fold

Die Chasers Recommendation in Effect

A sufficient number of written acceptances having been received for Simplified Practice Recommendation No. 51, Die Head Chasers (for self-opening and adjustable die heads) recently revised by the industry. The division of simplified practice of the Department of Commerce announces that the project is now in effect, as of April 1, 1928, subject to annual revision or reaffirmation by the industry.

Electric Locomotive Shipments Up

Although only six electric locomotives were shipped in April of this year as compared to 23 shipped in April, 1927, the total domestic shipments for the first four months were 55 as compared to 52 for the same pericd in 1927, according to the U. S. Department of Commerce. The shipments during the

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first three months were all higher this year than last. The unfilled orders totaled 42 on the end of April, 1927, and were 41 the last of the same month this year.

Consumer Production of Gases Foreseen

Large consumers of gases for welding and cutting may be potential gas producers, according to F. P. Wilson, Jr., General Electric Company, and, should economies justify the installation of equipment, consumers should be in a position to judge the relative merits of the apparatus available and determine which process would best suit the requirements with respect to the following factors:

The kinds of welding and cutting gases now used and possible substitutes; the effect of such substitutes on the selection of a process for manufacturing these gases; the economic need of consumer manufacture; the need of endeavoring to establish an economic balance between the gases used and the process selected for their manufacture, and the possibilities of applying these gases in industrial operations in which their use is now limited or in which it is non-existent.

Oxygen can be economically produced from the air by means of air liquefaction and subsequent fractionation, a physical process; or by the electrolysis of water, an electrochemical process. In the former case nitrogen is a by-product in the ratio of four volumes to one volume of oxygen. In the latter case hydrogen is a by-product in the ratio of two volumes to one of oxygen. Another commercial method of producing hydrogen in large quantities is by the liquefaction and fractionation of water gas. This latter process although used in Europe is not in general use in this country.

Acetylene and the electric arc have until recently been supreme in their respective fields of application in welding and cutting. Now, however, the economic supremacy of the former has been seriously challenged in welding as well as in the cutting to an extent which may result in an economic adjustment in the present system of gas manufacture and distribution.

The atomic-hydrogen flame has demonstrated characteristics which indicate its great value in many welding applications, and in many instances molecular hydrogen or city gas can replace acetylene as the fuel gas in cutting. Oxygen, the active agent in metal-cutting operations, will undoubtedly be used for years to come in this application and in constantly increasing quantities.

Because of the annual value of the gases used in many industries today, and the impending economic changes just over the horizon, the need is emphasized for a general knowledge of the relation existing between the process of manufacture and the use of these various gases.

$60,000 for Dallas Tracks

Three track rebuilding plans to be carried out by the Dallas Railway & Terminal Company, Dallas, Tex., have been tentatively announced by the supervisor of public utilities.

The plans include the removal of street car tracks on Parry Avenue and their rebuilding within the Fair Park, the rebuilding of car tracks on Cole Avenue from Lemmon to Knox Street and paving between them, and the rebuilding of car tracks on Commerce Street between Exposition Avenue and the Houston & Texas Central Railroad. These three projects would cost more than $60,000.

It was indicated that two other other improvement projects are being considered and will be incorporated in the plan before it is finally adopted.

T-Rails for Galveston

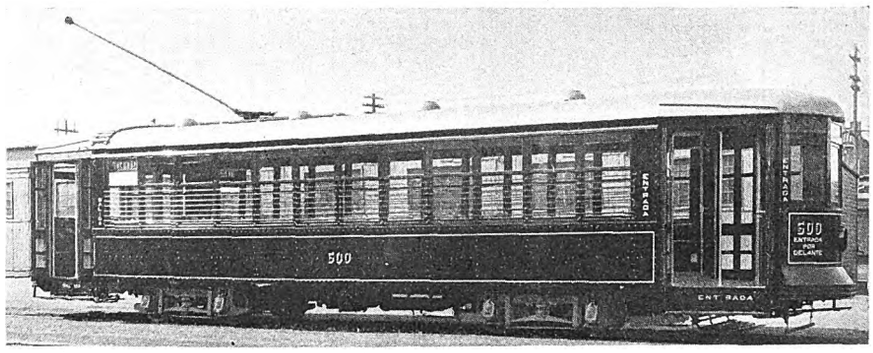
Permission has been granted the Galveston Electric Company, Galveston, Tex., by the city commissioners, to install T-rails instead of girder rails on Market Street from Nineteenth to Sixth Streets. The contract for the paving of the street has already been let and it is likely that the electric company will soon begin work on the installation of the new track and concrete surfacing.

Thirty More Cars for Mexico Tramways

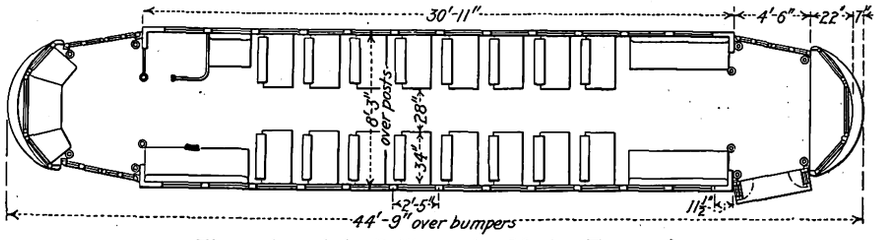
In addition to the twenty single-end cars delivered last October to the Mexico Tramways, Mexico City, the J. G. Brill Company, Philadelphia, Pa., has just delivered to the same company, 30 double-end cars.

These cars are 44 ft. 7 in. long, 8 ft. 5 in. wide and weigh 33,500 lb. They are of the two-man type and seat 50 passengers. The trucks have a wheelbase of 4 ft. 10 in., weigh 5,212 lb. each, and are equipped with outside-hung motors.

The finish is in Durban red enamel. The interior is trimmed in aluminum. An interesting feature is the use of ventilators over the vestibule windows.



One of the double-end cars just delivered to the Mexico Tramways



Floor plan of the Brill cars for Mexico Tramways

Name of railway	Mexico Tramways, Mexico City, Mexico
Number of units	30
Type of unit	Two-man, motor, passenger, city double end, double truck
Number of seats	50
Builder of car body	The J. G. Brill Company, Philadelphia, Pa.
Date of order	12/14/27
Date of delivery	10 cars 3/22; 10 cars, 3/31; 10 cars, 4/13
Weights:	
Car body	15,585 lb.
Trucks	10,425 lb.
Equipment	7,490 lb.
Total	33,500 lb.
Bolster centers	19 ft. 11 in.
Length over all	44 ft. 7 in.
Length over body posts	30 ft. 11 in.
Truck wheelbase	4 ft. 10 in.
Width over all	8 ft. 5 in.
Height, rail to trolley base	10 ft. 6½ in.
Window post spacing	29 in.
Body	Semi-steel
Roof	Arch
Doors	End, folding
Air brakes	General Electric
Armature bearings	Plain
Axles	A.S.T.M.-A-2-27
Car signal system	Faraday
Compressors	CP 27-B
Conduit	Metal
Control	K
Couplers	Self-supporting radia
Curtain fixtures	Curtain Supply Company
Curtain material	Pantasote
Destination signs	Hunter
Door mechanism	National Pneumatic
Fare boxes	Cox
Finish	Enamel, Sherwin-Williams Old Dutch railway
Gears and pinions	Grade M
Glass	D.T.A.
Hand brakes	Peacock Staffless
Headlights	Crouse Hinds
Headlining	Agasote
Interior trim	Aluminum
Journal bearings	Plain
Journal boxes	Brill, semi-steel
Lamp fixtures	Brill-G. E.
Motors	G.E.-275B, outside-hung
Painting scheme	Durban red
Roof material	Poplar covered with canvas
Safety car devices	Safety Car Company
Sash fixtures	National Lock Washer
Seats	Brill No. 103
Seat spacing	30½ in.
Seating material	Birch slats
Slack adjusters	American Brake Company E-1
Steps	Folding
Step treads	Kass
Trolley catchers	Earll
Trolley base	U. S. No. 13
Trucks	Brill 76-E-1
Ventilators	Brill exhaust
Wheels, type	Rolled steel, diameter 26 in.
Wheelguards	Root life guard

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Four Cars for Lackawanna & Wyoming Valley

Four cars were ordered by the Lackawanna & Wyoming Valley Railroad, Scanton, Pa., from the Osgood Bradley Car Company on April 18, as mentioned in the April 21 issue of the JOURNAL. The cars are to be of the two-man interurban type. Each car is to be 63 ft. 2 in. long, 9 ft. 3 in. wide. The weight will be 81,000 lb., and there will be seats for 76 passengers. The cars are to be equipped for both 600-volt third rail and overhead trolley operation. Complete specifications are given in the following table:

Name of railway	Lackawanna & Wyoming Valley Railroad, Scranton, Pa.
Number of units	4
Type of unit	Two-man, motor, passenger, interurban, double-end, double-truck
Number of seats	76
Builder of car body	Osgood Bradley Car Co., Worcester, Mass.
Date of order	April 18, 1928
Date of delivery	July, 1928
Weights:	
Car body	39,000 lb.
Trucks	25,000 lb.
Equipment	17,000 lb.
Total	81,000 lb.
Bolster centers	40 ft. 7 in.
Length over all	63 ft. 2 in.
Length over body posts	52 ft. 5 in.
Truck wheelbase	7 ft. 0 in.
Width over all	9 ft. 3 in.
Height, rail to trolley base	13 ft. 2 in.
Window post spacing	32 in.
Body	Semi-steel
Roof	Monitor
Doors	End, sliding
Air brakes	Westinghouse Air Brake Co., Automatic
Armature bearings	Plain
Car signal system	Westinghouse Air Brake Co.
Compressors	DH-25
Conduit	Flexible and metal
Control	Westinghouse AB
Couplers	Tomlinson
Curtain fixtures	Curtain Supply Co., ring type
Curtain material	Double faced pantasote
Door mechanism	Hand
Finish	Paint
Floor covering	Battleship linoleum
Glass	Plate
Hand brakes	Horizontal ratchet type
Heat insulating material	3-ply salamander
Heaters	Consol. Car Heating Co., R1501, A500 watt
Headlining	¼-in. Agasote
Interior trim	Mahogany
Journal bearings	Plain
Lamp fixtures	Electric Service Supplies Co.
Motors	Two, Westinghouse 557-D8, outside hung
Painting scheme	Maroon
Registers	Ohmer
Roof material	Steel frame, wood and duck
Sash fixtures	O. M. Edwards
Seats	Hale & Kilburn, Spec. 392 EE
Seat spacing	32 in.
Seating material	Chase plush (leather in some)
Steps	Stationary, steel
Step treads	Anti-slip
Trolley retrievers	Earll 5A
Trolley base	No. 3 Sterling
Trucks	Baldwin 84-35 AT & AA
Ventilators	Osgood Bradley duplex auto
Wheel diameter	33 in.

Electrical Glossary Published

For guidance in properly listing and classifying electrical apparatus and supplies in shippers' export declarations the Bureau of Foreign and Domestic Commerce, Washington, D. C., has compiled a glossary of electrical terms and instructions to exporters. Each item is listed alphabetically giving opposite each the class number and unit of quantity. A second listing contains the items listed by numbers. The foreword consists of articles of customs regulations for the guidance of exporters.

METAL, COAL AND MATERIAL PRICES

F. O. B. REFINERY

	May 8, 1928
Metals—New York	
Copper, electrolytic, cents per lb	14.0125
Copper wire, cents per lb	16.00
Lead, cents per lb	6.10
Zinc, cents per lb	6.3125
Tin, Straits, cents per lb	51.375
Bituminous Coal, f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	4.20
Somerset mine run, f.o.b. mines, net tons	1.875
Pittsburgh mine run, Pittsburgh, net tons	1.95
Franklin, Ill., screenings, Chicago, net tons	1.875
Central, Ill., screenings, Chicago, net tons	1.675
Kansas screenings, Kansas City, net tons	2.50
Materials	
Rubber-covered wire, N. Y., No. 14, per 1,000 ft	5.40
Weatherproof wire base, N.Y., cents per lb.	16.50
Cement, Chicago net prices, without bags	2.05
Linseed oil (5-bbl. lots) N. Y., cents per lb.	10.60
White lead in oil (100-lb. keg), N. Y., cents per lb	13.25
Turpentine (bbl. lots), N. Y., per gal	$0.5875

ROLLING STOCK

MONTREAL TRAMWAYS, Montreal, Canada, plans the purchase during 1928 of 58 buses of the 37-passenger, 15,000-lb., 90-hp. type. The bodies are to be constructed of duralumin and steel.

SAN ANTONIO PUBLIC SERVICE COMPANY, San Antonio, Tex., has purchased one 21-passenger, street car type, bus from the Studebaker Corporation, South Bend, Ind.

BOSTON ELEVATED RAILWAY, Boston, Mass., will purchase 28 gas-electric buses. Ten will be manufactured by the Twin Coach Corporation, Kent, Ohio, eleven by the American Car & Foundry Motors Company, New York, and seven by the Versare Corporation, Albany, N. Y. All buses will be equipped by the General Electric Company.

TRACK AND LINE

SPRINGFIELD STREET RAILWAY, Springfield, Mass., is planning to renew ties at various points on Carew Street.

LOUISVILLE RAILWAY, Louisville, Ky., is doing considerable track raising on Fourth Avenue at the present time, having raised the crossing at Fourth and Jefferson Street during the past week. The street has dropped as much as 6 in. in some places between Broadway and Main Street, as a result of the driving of a large sewer tunnel.

TRADE NOTES

BLACK & DECKER MANUFACTURING COMPANY, Towson, Md., has recently made the following changes in their sales organization: H. L. Balke is with the Kansas City branch, covering the territory around Omaha, formerly covered by Mr. S. D. Shawgo; G. F. Parr is with the Buffalo office, and has taken over the territory of J. H. Hutton; G. N. McCarthy has filled the vacancy at the Buffalo office, made by H. B. Austin, who has been transferred to Chicago; J. A. Murray is working in Baltimore, taking over the accounts formerly sold by Curtiss Watts; H. B. Hazerodt has resigned as manager of the Detroit branch and J. H. Walker, who has been a salesman in that territory, has been appointed manager. The new Detroit branch office is located at 11501 Woodward Avenue.

ROME WIRE COMPANY, Rome, N. Y., has appointed L. A. Zima district engineer in the New York office. Mr. Zima was formerly cable engineer in charge of design and specification of cables for power stations substations, and transmission and distribution systems of the Brooklyn Edison Company.

GENERAL ELECTRIC COMPANY, Schenectady, N. Y., has appointed C. W. Stone, formerly manager of the central station department, to the position of consulting engineer, and has selected M. O. Troy as manager of the central station department.

IDEAL COMMUTATOR DRESSER COMPANY, Sycamore, Ill., has appointed Superior Supply Company, Bluefield, W. Va., as sales representative for the sale of ideal commutator resurfacers and other maintenance equipment in the Bluefield territory.

ROLLWAY BEARING COMPANY, Syracuse, N. Y., announces the appointment of Alfred E. Munch, Jr., as representative in the Chicago-Milwaukee district, with headquarters at 544 Railway Exchange Building, Chicago.

ADVERTISING LITERATURE

INGERSOLL-RAND COMPANY, 11 Broadway, New York, has just completed the sixth edition of its 140-page, two-color book, entitled, "100 and 1 Ways to Save Money with Portable Compressors." In this book the company has embodied comparative cost data on its portable air compressors and air-operated tools. The information has been put together in handy reference, cross index form. In most cases, figures are presented on a man-hour basis so that they can be readily applied to local conditions in any part of the world. Free copies may be obtained by writing to the company in New York or at any of its local branches.

MARTINDALE ELECTRIC COMPANY, Cleveland, Ohio, announces a new No. 10, 36-page catalog on motor maintenance equipment.

JOHN C. DOLPH COMPANY, Newark, N. J., has published a solvent and calculating chart for insulating varnish. It enables the user to determine the correct amount of solvent needed to bring the varnish to the required gravity for dipping. It also includes directions to determine the number of gallons of varnish contained in removable head drums.

AMERICAN CAR & FOUNDRY MOTORS COMPANY, New York, has published two booklets descriptive of A.C.F. parlor coaches and A.C.F. de luxe urban coaches.

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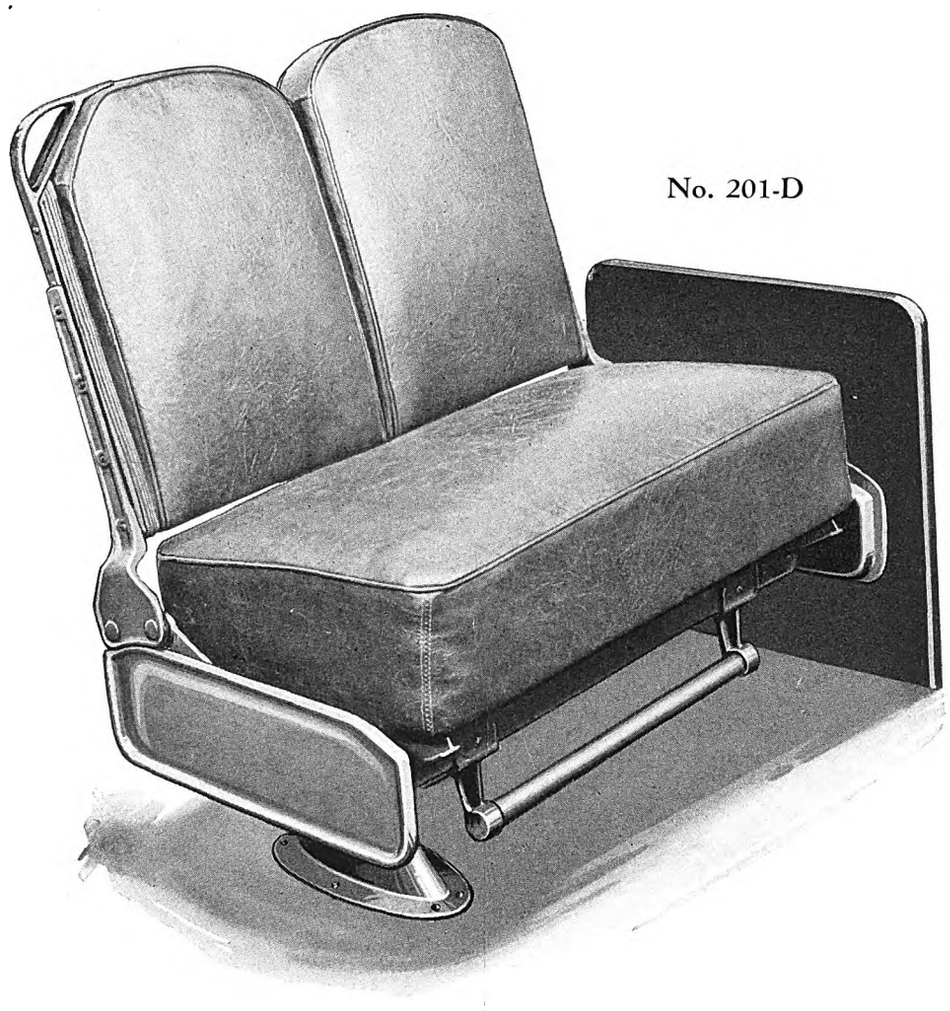

No. 201-D

Seat Satisfaction

Comfort is one of the most important requirements of modern electric cars, if the investment is to yield a fair return. And no detail of equipment affects the "comfort consciousness" of passengers more than the seats.

Brill Seat No. 201-D is an example of seat satisfaction because it is downright comfortable and possesses the inbuilt wearing qualities which impart long life. For these reasons, Brill seat No. 201-D is popular with operating companies as well as the traveling public. It is one of many Brill Seats which are playing an important part in building transportation sales.

Specify Brill Seats—it pays.

THE J. G. BRILL COMPANY
PHILADELPHIA, PA.
AMERICAN CAR CO. ST. LOUIS, MO. — G. C. KUHLMAN CAR CO. CLEVELAND, OHIO. — WASON MANF'G CO. SPRINGFIELD, MASS.

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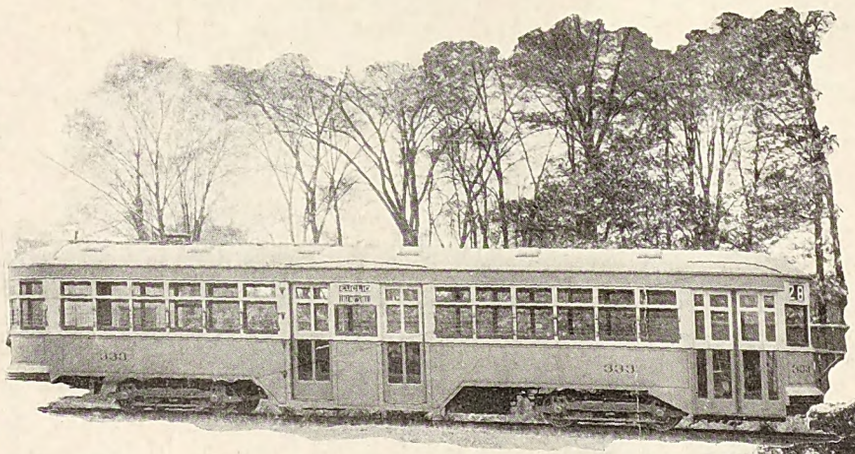
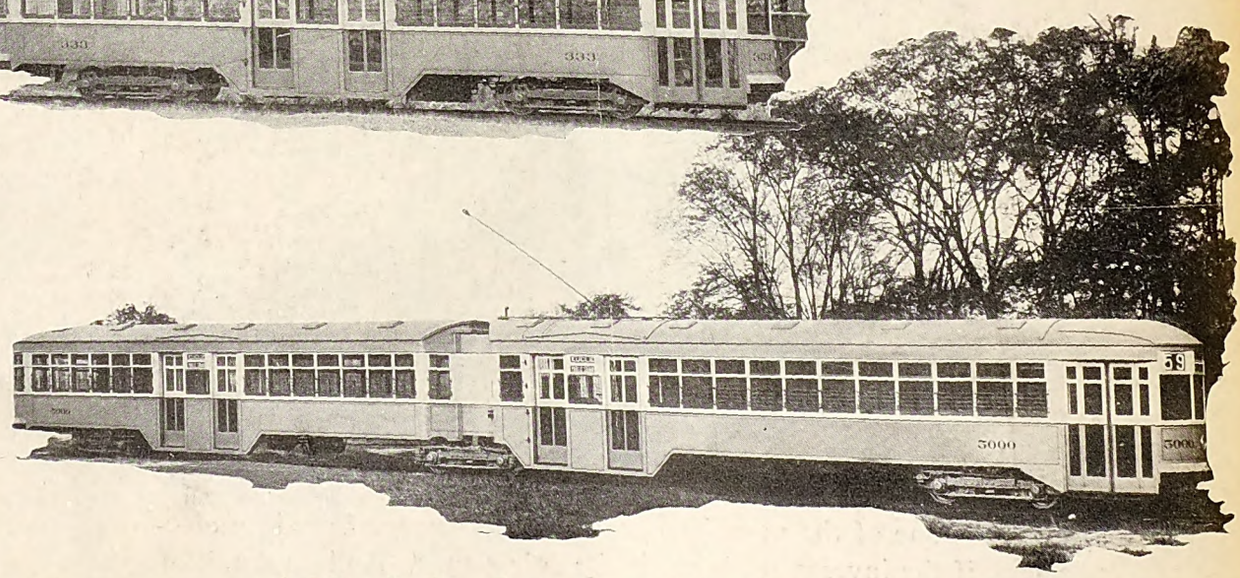
HASKELITE

on the new
Cleveland Cars



The Cleveland Street Railway Company is having 25 articulated cars and 50 single cars built by the G. C. Kuhlman Car Company, Cleveland, Ohio. The sample cars illustrated were built last year.



ALL of the plywood used in these cars will be HASKELITE. The applications of this blood albumen glue plywood include wainscoting and other interior trim, molded linings in the connecting vestibule on the articulated cars, and the roof of the vestibule.

Leading builders and operators of street cars and buses are choosing HASKELITE wherever strength, light weight and appearance are to be combined. Ask for our blueprint booklet.

Haskelite Manufacturing Corporation

120 S. LaSalle Street, Chicago, Illinois

Railway Representatives:

Economy Electric Devices Co.,
37 W. Van Buren St., Chicago

Grayson Bros.,
600 LaSalle Bldg., St. Louis, Mo.

Railway & Power Engineering Corp., Ltd.
Toronto, Ont., Canada

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MAINTENANCE AND CONSTRUCTION ISSUE

ELECTRIC RAILWAY JOURNAL

McGraw-Hill Publishing Company, Inc. MAY 19, 1928 Twenty Cents Per Copy

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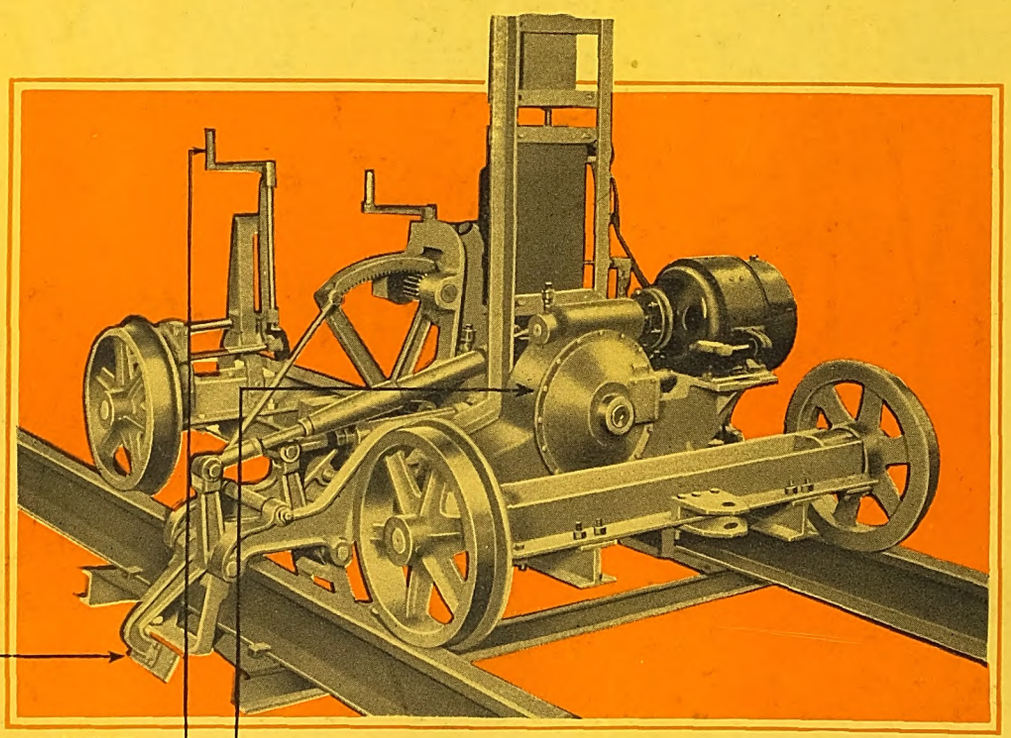

Lifting mechanism raises tamping arms clear of paving so that tamper can be taken to the job behind work train. Adjustment for different rail heights is provided for.

This hand lever operating geared drive propels the tamper along the track.

The motor, operating from overhead, drives through completely enclosed worm reduction gear, with clutch contained in the same housing.

now ready—

A Redesigned Machine for Compression Tamping

The Model A compression tamping machine, after careful redesigning based on field experience, is now ready. The first four machines, after thorough tests, are on their way to the job.

A stepped-up production schedule, proportioned to the wide interest in compression tamping and the unusual acceptance of mass production principles for paved track construction with Steel Twin Ties, will provide other machines quickly enough, we hope, to keep up with the demand.

Modern production methods plus Steel Twin Ties have revolutionized paved track construction. The results are two fold. More rapid, less expensive construction, plus greater permanence in the track so built.

A Bulletin, describing the new compression tamper and other modern track construction machinery will be gladly sent you.

THE INTERNATIONAL STEEL TIE CO.
CLEVELAND, OHIO

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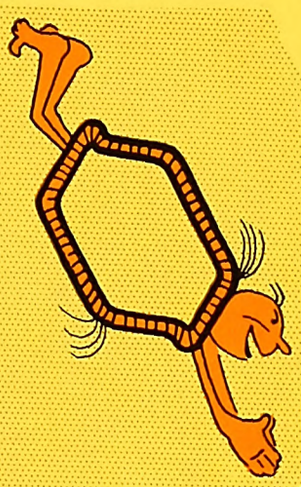

BUY MORE AND SPEND LESS!

—for your maintenance work

1000 REWINDS IN 1925
600 REWINDS IN 1927

THIS record is only one of a number of accomplishments which the management of the Pittsburgh Railways Company has obtained through an economic analysis of its maintenance problems.

A similar economic analysis of your maintenance problem will, no doubt, convince you that you cannot be efficient in both manufacture and maintenance and that it pays to buy coils from the original manufacturer of your motors.

Heat and moisture have no terror for these boys

Westinghouse Renewal Parts Reduce Maintenance Costs

Westinghouse Electric & Manufacturing Company
East Pittsburgh Pennsylvania
Sales Offices in All Principal Cities of the United States and Foreign Countries

MEMBER AMERICAN ELECTRIC RAILWAY ASSOCIATION AERA

1928

Westinghouse

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Electric Railway Journal

McGraw-Hill Publishing Co., Inc.
JAMES H. MCGRAW, *President*

Consolidation of
Street Railway Journal and
Electric Railway Review

CHARLES GORDON
Editor

Volume 71 — *New York, Saturday, May 19, 1928* — *Number 20*

Adequate Testing Is Good Insurance

CLOSE attention to every detail of maintenance of the motor, which is the heart of the car equipment, will do much to prevent failures. All motor repairs for a system should be done at one shop. It is only by such centralization that uniformly good results can be obtained. Overhaul methods which have been tried and found most effective should be used. Chemical cleaning tanks for housings, boring of armature bearings after they are pressed into housings, and dipping and baking processes are some outstanding practices that produce real results and eventually lower maintenance costs.

Adequate tests of overhauled motors is important as a means of making sure that nothing has been overlooked. The load method described elsewhere in this issue is one example of what a progressive property is doing to make certain that its equipment will perform satisfactorily when returned to service. It is the test to which all overhauled railway motors are subjected by New Orleans Public Service, Inc. At the last meeting of the Electric Railway Association of Equipment Men, Southern Properties, a representative of this railway stated that the payroll is 30 per cent less than five years ago while the number of car-miles operated is only 15 per cent less. This is striking evidence that money spent on putting equipment into first-class physical condition, and upon adequate testing facilities to insure against failure in service, is money well invested.

One Hundred Men in 1927 Did Work of Four Hundred in 1909

CONVINCING evidence of the great saving in man power made possible by the use of modern machinery is found in figures compiled by the Boston Elevated Railway concerning a recent track reconstruction job in Somerville. The work involved the reconstruction of 17,566 ft. of single track which had been in service for eighteen years. The old track was built in 1909 with 8-in. T-rail laid partly on wood ties and partly on steel ties. Joints were cast welded. The new track is built with 7¼-in. T-rail on International twin steel ties. Joints are seam welded. The old concrete base has been retained and the new track laid upon it.

On account of the narrowness of the street it was impossible to use a temporary third track during the course of construction. Work was carried on during regular working hours with a maximum force of 100 men. The entire job was completed in a period of four months without interruption to car traffic on the line. At the time of the original construction a maximum force of 400 men was employed. Curiously enough, the same foreman was in charge of both jobs.

Modern track-building machinery was responsible for this impressive reduction in the size of the force required to do the work. In 1909 all material was handled by trucks drawn by teams of four or six horses. Loading, unloading and placing of material was done by hand. In 1927 the old granite-block paving was broken up by means of a pavement plow. The blocks were loaded on motor trucks by a Barber Greene snow-loading machine equipped with special buckets. The old rail was cut by acetylene torches to short lengths for easy handling. Fastenings of the steel ties were burned off. The old base was swept clean by means of a tractor sweeper. New rails and ties were handled by a special rail carrying car equipped with an electric crane. Joints were welded electrically.

On this recent job one man with modern equipment accomplished a better result than four men with old tools had accomplished eighteen years ago. In the entire electric railway field it would be hard to find a better example of the profitable employment of machinery to save manual labor.

A Field for Special Bus Maintenance Equipment

VISITING the bus repair sections of most shops, one is impressed particularly with the lack of sturdily built tools for carrying on the work. Many of those in use are obtained from automobile accessory distributors and do not stand up in the continued service of a bus repair shop. In keeping buses on the road, tools are subjected to hard and continuous service that calls for very much more rugged design than has been customary in automotive practice.

Usually the tools now available were designed for automobile work and are little better than toys when put in the severe service of bus repairs. More sturdy tire changing equipment is needed. Wrenches and hand tools of cheap construction should not be used, stones and honing machines for hand-lapping and valve grinding often do more damage than they do good for the class of work found in bus repair shops. Presses, jacks, motor stands are among the miscellaneous items of shop equipment designed particularly for the service imposed in a bus garage. More production machine tools of this type are needed so that the work can be turned out rapidly and satisfactorily.

Shop equipment of ample capacity and ruggedness for bus maintenance is far too difficult to obtain at the present time. Some electric railway maintenance men have been misled into the installation of the comparatively light and ineffective equipment developed for automobile garages. All too often such equipment has

This is the issue in May that is devoted essentially to maintenance and construction subjects

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proved entirely inadequate for bus maintenance purposes. Obviously there exists a distinct opportunity for the alert manufacturer of such equipment to develop machinery suitable for the maintenance of buses on a commercial basis. It is probable that there is a considerable field for the sale of such heavier duty maintenance equipment to large truck fleet owners as well as to bus operators and that a large and growing market exists which has been comparatively undeveloped.

Replacement Before Breakdown a Criterion for Pull-Ins

WHY does one city company show pull-ins every 4,000 miles and another show pull-ins every 100,000 miles? Is it necessarily due to a difference in definition of "pull-in," of character of equipment, of quality of materials, of skill in workmanship or character of service?

Inspection of property after property, over many years, indicates that the predominant reason is none of the foregoing. The most important factor is managerial policy. Does the department head or management place more stress on the minor factor of getting the last mile of service from materials or on the major factor of uninterrupted delivery of vehicle-miles to the public?

There is a strong temptation to place too much stress upon comparisons that don't compare, so to speak. The superintendent of equipment is driven to the point where he tries to get the last possible revolution out of a car wheel and trolley wheel or the final 64th of an inch from his bearings. The adoption and use of limit of wear gages as a measure of the time to scrap wearing parts has been painfully slow because of this constant pressure to get the last mile of wear.

The saying "Prevention is better than cure" is as old as the well-known hills, but it is just as true as ever. Pull-ins, exclusive of those for accidents, are not inevitable. They *are* preventable. Their elimination is wholly and solely a matter of replacement before breakdown. Is that trolley wheel groove so distorted and worn that it will inevitably tear down some of the overhead tomorrow, if not today? Has that car-wheel flange worn down to the chipping line? Will that commutator get by for another round trip before it is reslotted? Will those motor suspension axle bearings go till the next overhauling? All of this means taking chances on service interruptions.

A superficial view of the subject might lead to the conclusion that a more liberal scrapping policy to prevent trouble would increase costs so far as the mechanical department's showing is concerned. The contrary has proved the case on properties where maintenance policy has been altered along the lines indicated. It is true that the mileage per item may be lowered, but the over-all costs are less, since a pull-in generally involves much more than the replacement of the outworn or weakened part.

From the standpoint of the transportation department, the question of which is the better policy is not even a debatable one. It is not enough for electric railways to provide the lowest cost transportation service. They must also make good so unfailingly that those who patronize electric cars will have to think long and hard before they can recall leaving a vehicle because of a breakdown. A certain automobile maker, who shall be nameless for once, said of his product: "It takes you there and brings you back." That is a good slogan for the electric railway maintenance man!

Fenders Require Careful Attention

WHEN car fenders were first put on the market careful attention was given to the initial cost, simplicity of design, ease of installation, maintenance cost, sensitiveness, tripping and pick-up reliability before a selection was made. Unsuccessful types have long since passed out of existence, so that today there are only a few types on the market. These have proved reliable after years of service. Continued reliability, however, can be assured only by proper maintenance. The cost to keep fenders in serviceable condition is only a small part of the total cost of the equipment maintenance, but nevertheless the device requires constant attention.

Often a fender will be damaged in service by hitting an obstruction. Though this damage may be slight, it is essential that all the parts should be looked over carefully and the fender tripped several times by means of the gate before the car is returned to service. Ignoring those precautions may mean a fender failure at a critical moment. This possibility of failures can be lessened to a marked degree by checking the height of the apron and gate and their freedom of operation every night or every second night. It is also important to see that the fender will pick up and latch securely. Often a fender will be tripped in service, and afterward, due to a faulty latch, it cannot be held up in position. This may cause its total destruction if the trouble is not detected, with a resultant material increase in the maintenance cost.

Financial Status Improved by Better Maintenance

STANDARDS of maintenance have changed radically during the past 25 years, but not more than have the standards of service that are adhered to by the more progressive electric railways. Early in the present century car failures were looked on with a certain complacence, and were considered more or less as unavoidable evils. With the change that has taken place in the character of service it has become recognized more and more that the public is intolerant where failures of railway service are involved.

The easiest way to reduce failures in service is to replace old parts with new at the first sign of destructive wear. This is not always feasible, and occasionally it is necessary to keep equipment in service for many years longer than would ordinarily seem desirable. An instance of this is seen in the New York & Queens County Railway, particularly with regard to its motor equipment. When its cars were purchased, more than 25 years ago, the motors were as good as the art afforded. Not only are these motors hopelessly out of date today, but until quite recently they had been allowed to go without even ordinary care. As a result failures were far too frequent and the service suffered accordingly.

It was not possible to purchase new cars or new motors, so the present management decided to make the best of the bargain and do away with the hand-to-mouth repairs that had become the practice. Enough money was spent on the motors not only to restore them as nearly as possible to their original condition, but in some respects to make them approach modern practice. The article by Thomas V. Campbell in this issue tells how thoroughly this work has been done.

Ordinarily it would not pay to spend as much money on rehabilitating old equipment as was done here. But

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in the present instance it was manifestly impossible to obtain new capital. The repairs will permit the motors to give further reliable service. The maintenance costs have been reduced to normal. There has been about 1,000 per cent increase in bearing mileage and 75 per cent reduction in electrical failures. These are important factors in the maintenance of regular schedules, and consequently in the increased patronage now coming to the company. Furthermore, the improvement in the company's financial status may make it possible later on to finance new equipment where today that is impossible.

Equipment Designers Should Follow Closely the Problems of Operation

COMPLAINT is sometimes made by manufacturers that their equipment fails because it is improperly maintained. Often, however, it will be found that sufficient attention has not been given by the designer to making maintenance easy. If parts are to be inspected properly they must be accessible. If lubrication is needed there should be ample provision for it. The parts should be sufficiently rugged so they will not be damaged easily by unskilled workmen.

An example of unfamiliarity of the designer with maintenance occurred recently in connection with some equipment which had a shaft rotating at low speed. A pressure grease lubricating system was installed for the two bearings at the ends of the shaft. As the shaft was short, the grease cup was placed at the center and the lubricant was supposed to work toward each end. Only one end of the shaft was visible to the greaser. As it happened, the bearing at this end had more clearance than the invisible bearing. The workman forced grease in until it could be seen coming out of the end which was visible and assumed that the other end also was receiving its share. Seizing of the bearing at the far end soon resulted in serious damage to the shaft and bearing. When the apparatus was taken apart for repairs it was found that sufficient grease had not reached the damaged parts. Equipment gives best service which is worked out after close study of the conditions under which it must be maintained.

Decentralization Urged by Regional Plan of New York

SPENDING a billion dollars for subway construction in the next fifteen years will not solve the transit problem in New York City. Such is the conclusion reached in a comprehensive report on transportation recently published by the Regional Plan of New York and Its Environs. The reference to an expenditure of $1,000,000,000 includes the Transit Commission plan of 1922 calling for extensions to existing systems to cost at least $306,000,000, and the Board of Estimate proposal of 1925, requiring the expenditure of $543,000,000 for an independent municipal system. The report points out that the subways have never been able to keep pace with the demand for their use, and that the building of new subways to feed the present congested areas merely makes congestion worse. Additional facilities, instead of being planned to carry people to and from districts that are already overcrowded, should be planned to encourage a better balanced distribution of industry and population.

Despite the remarkable development of skyscrapers in the downtown section of the city, and more recently in the midtown section, the average height of buildings on Manhattan Island is still comparatively low. Yet some 3,000,000 persons now enter Manhattan south of 59th Street on a typical business day. If the policy of concentration continues, congestion will become worse. At present, however, there is no indication of a halt. The purpose of all the transit plans thus far proposed is to concentrate traffic in the congested portions of lower Manhattan, because that is where the majority of the passengers now desire to go. Rather than to foster this trend, the report recommends that additional facilities be so arranged that there will be gradual dispersion of traffic among a multiplicity of subcenters.

It is pointed out that this probably can best be attained by developing a system of belt-line and by-pass routes that would encourage a more desirable distribution. Only under a unified transit system for the entire city could such routes be developed successfully. With independent operation the tendency is always to tap the areas of greatest congestion in order to secure the maximum amount of business in the minimum time. All means of transportation, according to the report, should be planned to furnish direct routes not only to the older business centers but to the new ones which are arising or may be expected to develop. Short hauls between residences and places of work are advocated as a means of relieving congestion.

Builders of Great Industries Are Entitled to Fitting Rewards

B. C. COBB, Samuel Ferguson and M. S. Sloan are among the men in the utility industry who have deemed it judicious recently to raise their voices against the constantly growing tendency of government to inject itself into business. Although the point of view expressed by these utility executives is quite similar, the particular interest of transportation men attaches to the remarks of Mr. Cobb because of his position as chairman of the electric railway Advisory Council.

Mr. Cobb spoke before the Chamber of Commerce at Jackson, Mich. His subject was "Michigan and Her Public Utilities." In the course of his remarks he said some things about those who would create an "Electric Trust" bogey man, and the propensity of government to interfere with business, that were very much to the point. Mr. Cobb is proud of his country, but he is not proud of the mess it has made of the handling of the merchant marine. He is not proud of certain other governmental activities that might better be left to other hands. He reminded his audience not to forget that when their forefathers wrote the Constitution they intended that the government should stay out of business. Many there are who think our forefathers were wrong in what they did, but Mr. Cobb does not think so. As he sees it, tie men's hands, crush down their spirit by governmental interference and operation, take away the reward for work well done, and the incentive to do is killed.

Like many other men, Mr. Cobb is unable to understand why the desire should exist to throw a brick at the electric industry, the industry that has done more in the past ten years for the advancement of American manufacture and American labor than any other industry in the country. It certainly is a queer manifestation, this one in the United States, that looks with suspicion upon the men who build great industries.

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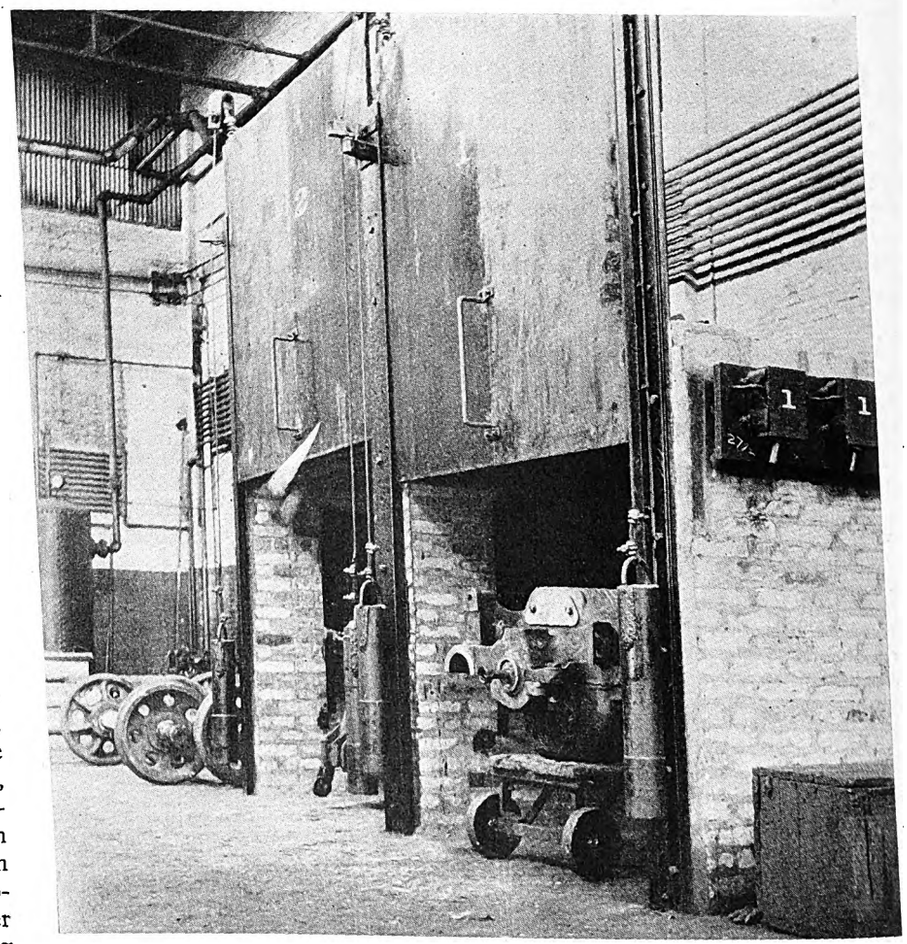
MOTOR REHABILITATION

Decreases Troubles

By Thomas V. Campbell
Superintendent of Maintenance of Fisk & Roberts
Consulting Engineers and Managers New York & Queens County Railway
Woodside, N. Y.

WHAT can be accomplished to solve the problem of excessive motor maintenance costs? The answer is afforded in the experience of the New York & Queens County Railway in increasing the life of armature and axle bearings and decreasing field and armature failures. The life of bearings has been prolonged tenfold and electrical failures reduced 75 per cent as a result of a complete motor rehabilitation program involving welding and reboring of armature and axle bearing fits, dipping and baking armatures and fields and installing a new method of bearing lubrication.



Bake ovens showing sliding doors, counterweights and motors being entered for preheating. The heater control switches can be seen on the brick wall

Rebuilding of GE-80 Motors

Early in 1902 twenty-eight double-truck cars with GE-80 four-motor equipments were put in regular service on the various divisions of the railway. The usual practices were followed in maintaining the bearings, and mileage was consistent with the grade of bearings used. However, in 1925 an epidemic of broken bearings resulted in a heavy increase in maintenance costs and a reduction in the mileage per bearing from approximately 80,000 to 15,000. After a careful study of the underlying reasons for the breakage it was determined that the cause was abnormal wear on the upper armature bearing housing, axle bearing housing and caps, which permitted the bearings to shift from their correct position.

Immediate steps were taken to prevent this bearing destruction and to restore the cost of maintenance to a normal basis. Although ample electric welding facilities were available for the building up of the worn parts, it was nevertheless found that there was no machine in the shop suitable for the boring process. A machine that had been used for similar work on another type of motor was purchased and a number of mechanical changes were made so that it would be suitable for the reboring of GE-80 motors. When these changes were completed and the machine was installed in its permanent location, plans were formulated and schedules arranged for a systematic rehabilitation of the entire group of motors.

Electric welding was used to build up the worn surface of the armature housing. This permitted a new bore $\frac{1}{4}$ in. less in diameter than that furnished by the manufacturers. This was done in order to avoid the purchase of heavy bronze bearings, thus effecting a substantial saving. The lighter casting fitted to the new bore has shown a large increase in mileage.

To correct the axle liner housing and cap wear, it was decided to build up the surface by electric welding to such a degree that it could be rebored to its original size. This was necessary because the axle linings used on these motors are designed with a wall only $\frac{1}{4}$ in. thick on account of being used on a 5-in. axle. The bearing would not have sufficient strength if the bore were decreased, as was done on the armature bearing housing.

The welding current was obtained from a 30-kw.

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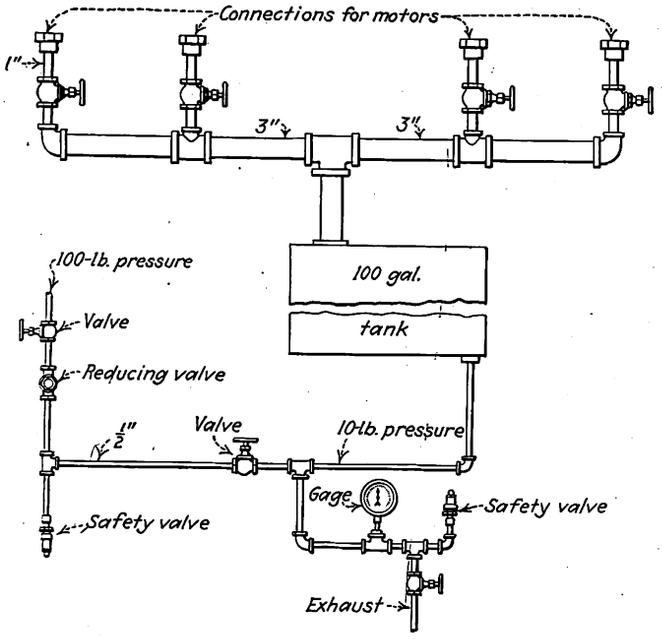
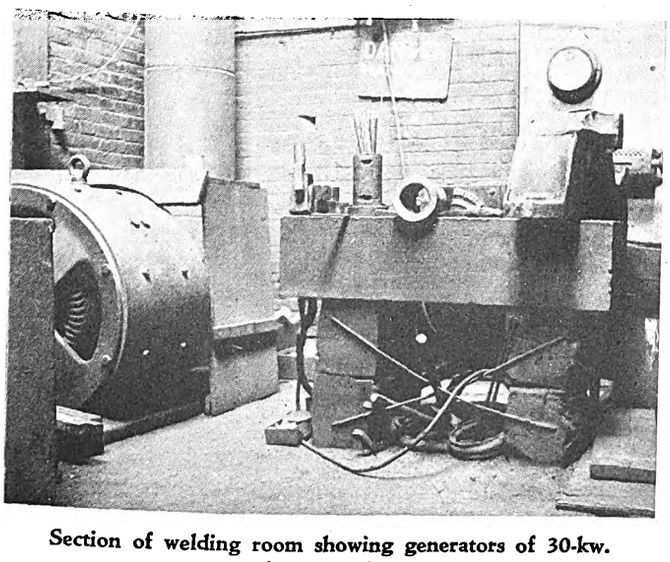


Arrangement of piping for painting motor frames and fields

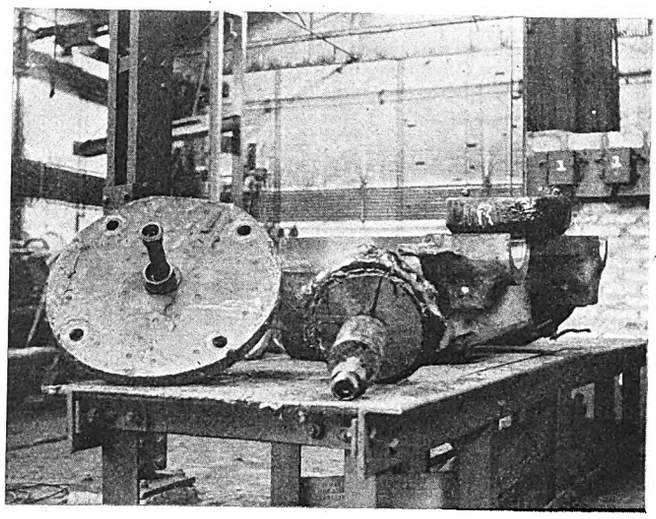
motor-generator set manufactured by the Allegemeine Elektricitäts Gesellschaft, the generator being designed to operate up to 65 volts and deliver a maximum of 460 amp. The motor operates from the 500-volt shop circuit. The welding metal was laid on the surface longitudinally, and the rough edges were later trimmed off with an electric motor-driven portable emery wheel. The motor frame was then ready to be finished in the boring machine. The cutting tools of this machine are attached to the ends of the boring bars, and the centers of these bars are adjusted to the axle and armature shaft bearing centers furnished by the motor manufacturer. Since the lower halves of the motor frames were not to be rebored, it was possible to install permanently the lower half of a GE-80 motor frame on the traveling bed of the mill in correct alignment. This simplified the set-up and eliminated the necessity of lining up each top half, it being merely bolted to the lower half. A cast-iron drum or jig was made up and installed between the two halves of the motor frame at the field poles. This assured the proper distance between the shaft centers and the field poles. This jig has a bronze bushing in the center through which the boring bar passes, eliminating whipping. Two wrought-iron braces were forged and bolted to the angle projection of the traveling bed to take care of the strain caused by boring all four housings at the same time. Holes were cut in the permanent half of the motor frame to permit snap-gaging the bores on the pinion end during the machining process. The regular openings provide a means for accomplishing the same result on the commutator end. The machine is driven by a direct-connected 500-volt motor.



Section of welding room showing generators of 30-kw. motor-generator set

Lubrication of Bearings

After careful consideration it was decided to adopt the Rico vacuum oiling system and make the necessary bearing housing changes to accommodate the apparatus while the motor frames were being rebored. This method



Field-coil assembly stand with finished motor frames and pinion-end connections for painting GE-80 and GE-210 motor frames. The built-up jib crane is also adjacent to bench

was considered far superior to the former one, since the employee engaged in the lubricating and inspection of bearings is guided by a specified standard.

The opening in the armature bearing housing waste window had to be reduced to 1x3½ in., and a 1x3-in. slot was left in the housing. Plates ⅛ in. thick welded to the outer edges of the slots in an angular position in the waste chambers form a funnel which permits the oil-saturated waste to fall by gravity to the point of contact. Similar changes were made in the axle housing to accommodate the new oiling system. In addition to the change in the top part of the axle-bearing housing, the larger waste window in the axle cap was closed entirely by a ¼-in. plate welded to the sides. This permitted changing the design of the bearings so that the upper and lower halves of the axle liner would be identical and thereby interchangeable. This is obviously a great advantage; the greatest wear occurs on the top half of the bearing, because most of the weight is suspended through the top half to the axle and the pressure is increased when the motor is in operation in one direction.

After the various parts of the motor are welded and machined, they are stenciled with a number corresponding to the manufacturer's number appearing on the motor frame. This is done to eliminate errors in assembling motors with parts which have not been machined together.

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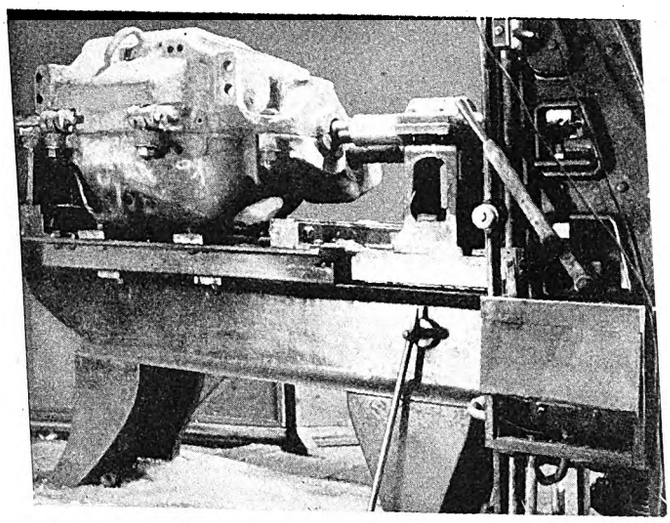
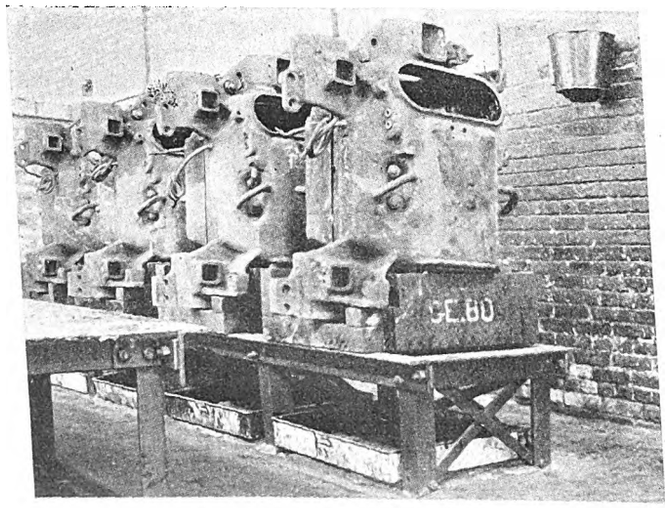


Horizontal boring machine showing the two boring bars and **upper half of GE-80 motor frame bolted to lower half permanently fastened to the traveling bed**

After the boring process is completed the frame is removed from the boring mill and transported to the field assembly bench. The framework of this bench is made of 3x3½-in. angles and is 22 in. high, 30 in. wide and 12 ft. long. This framework is covered by ⅛x6-in. steel strips riveted to it. A built-up jib crane 25 ft. high is located adjacent to this bench and is designed with a 6-in. I-beam boom 12 ft. long that will handle the motors on this and the adjacent painting bench. The crane is made from 6-in. channels and tied together with ½x6x12-in. plates. The weight is carried on a pivot plate 12x12x¾ in. which is bolted to the floor and allows for free movement of the boom. The boom is reinforced with a 1-in. round iron rod fastened to one end and to the gaff. Adjustment is made by a turnbuckle. A 2-ton chain hoist and a 2-ton air hoist provide the motive power for lifting.

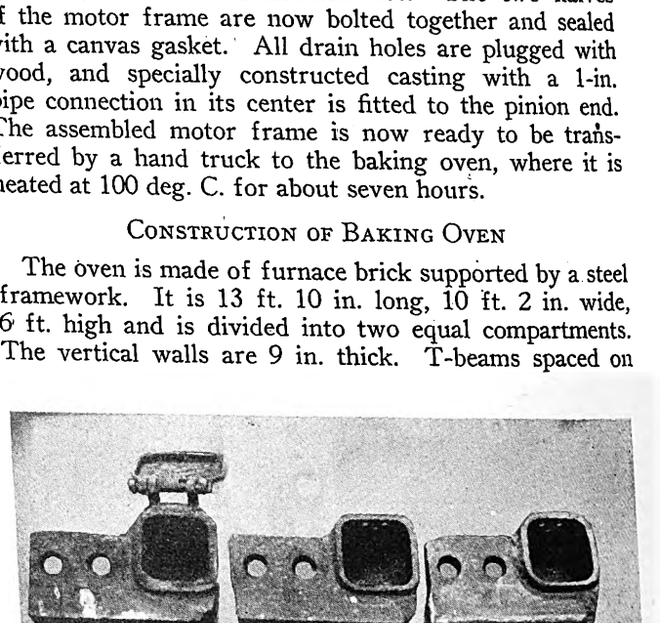
After the motor frame is placed on the assembly bench, it is blown out and cleaned thoroughly. The field coil seats are smoothed and all projections are removed. Then the frame is painted. Impregnated field coils are installed and bolted in place. Care is exercised to see that the field coil springs, oil canvas liners, side and top shields are in proper position. The connections are then made for internal and external use. The two halves of the motor frame are now bolted together and sealed with a canvas gasket. All drain holes are plugged with wood, and specially constructed casting with a 1-in. pipe connection in its center is fitted to the pinion end. The assembled motor frame is now ready to be transferred by a hand truck to the baking oven, where it is heated at 100 deg. C. for about seven hours.



Painting stand with four GE-80 motors installed in vertical position ready for internal painting

Construction of Baking Oven

The oven is made of furnace brick supported by a steel framework. It is 13 ft. 10 in. long, 10 ft. 2 in. wide, 6 ft. high and is divided into two equal compartments. The vertical walls are 9 in. thick. T-beams spaced on 10-in. centers form the ceiling framework, which is filled in with firebrick. Each compartment is heated with 32 double coil electric heaters arranged in four circuits controlled by individual switches. The front of each compartment is inclosed by a door made from No. 16 gage sheet steel. The space between the inside and outside sheathing is filled with magnesia blocks. The doors are raised and lowered vertically and are counterweighted with a piece of 5-in. car axle suspended on a ¼-in. steel cable passing over pulleys. The end guide for these doors is made of two angles that form a Z bar with a plate bolted to it. The center guide is built up of two plates with 1½-in. spacers, thus providing a double guide to accommodate both doors.



Three stages in changing the waste window of GE-80 axle cap on left. Center, ¼-in. plate installed and ready for welding. Right, welding completed.

Painting Motor Frames and Fields

After the preheating the motor frames are removed from the oven and placed in a vertical position on a specially constructed rack. The pipe connection that was inserted in the frame before baking is now pointed downward. This rack is adjacent to the field assembly stand. Its framework is made from 3x3½-in. angles and is 17 in. high and the same length as the assembly stand. This steel framework supports individual wood frames made of oak, each designed to support one motor safely in a vertical position. The stand will accommodate four motors. Directly under it and beneath the floor is a 100 gal. tank in which the insulating paint is stored. A 3-in. header extending the entire length of the rack is installed below this rack and is connected to the top of the tank.

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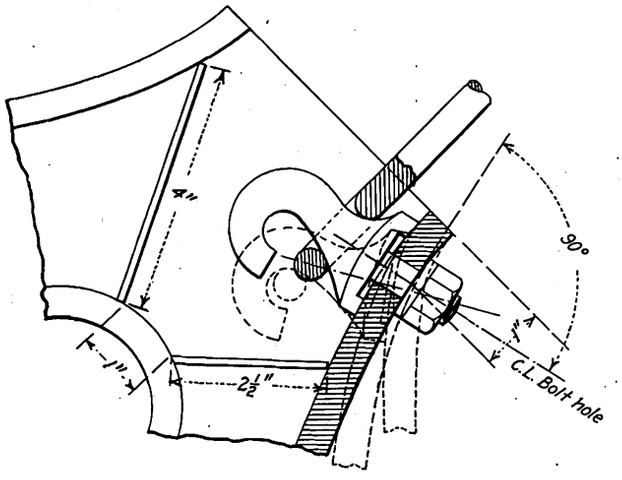
Vertical risers are tapped off of this header under each motor. A union connection and valve installed on the end of these risers permits connecting the motor to the paint supply pipe and controlling the paint outlets. The 100-lb. shop air line is connected to the bottom of the tank through a reducing valve, gage and supply valves. This air pressure is reduced to approximately 10 lb. When the motor frames are in their proper position and the pipe connections are made, the air pressure is increased in the tank, forcing the paint into the motor frame to a height above the field coils. The paint remains in the motor frame until its temperature decreases to about 20 deg. C., measured by a thermometer. Then it is drained back into the storage tank by releasing the air pressure.

Final Operations

When the paint is drained thoroughly the motor frame is disconnected and returned to the assembly rack. It is opened and all sealing material and fixtures removed from the pinion end. The laminated pole faces are now cleaned thoroughly with gasoline to remove excess paint and assure a clear surface. An overhauled armature with its newly-fitted bronze bushing is then inserted. Redesigned axle liners are placed at the same time and secured by the lower cap to keep them intact until they are placed in the truck. Next the completed motor is placed on the floor, and power is applied intermittently through a controller, the motor being run in each direction for several minutes. This makes certain that the bearings are fitted properly, that no undue heating will develop, and that the electrical work has been performed properly.

The painting equipment was developed for this property by the Fisk & Roberts management primarily to safeguard the fields against premature breakdowns. Some of the tracks are laid through a section which is not

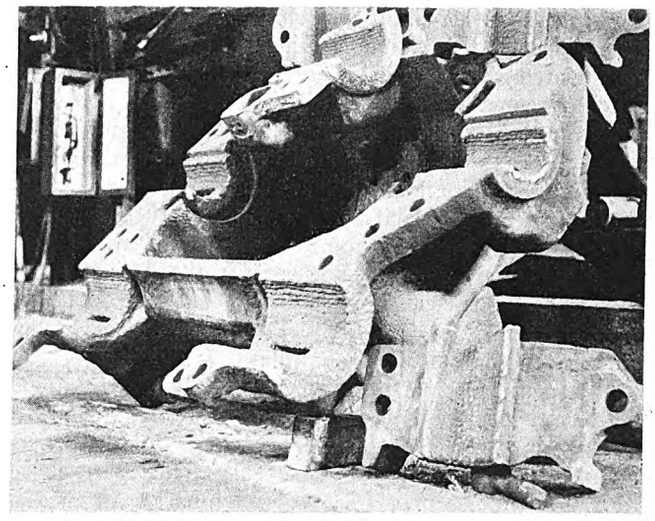


Sketch showing angular plates installed in armature bearing lining

drained. The result is that these tracks are often covered by water 4 to 10 in. deep. The painting process has practically eliminated failures due to this cause.

Overhauling GE-210 Motors

In 1910 twenty double-truck cars with GE-210 two-motor equipments were placed in service. Since then they have been operating continuously. Early in 1924 some wear developed in the armature bearing housing. We decided not to build up the housing as was done with the GE-80 motors but to rebore it to a large diameter and install an oversize bronze bushing.



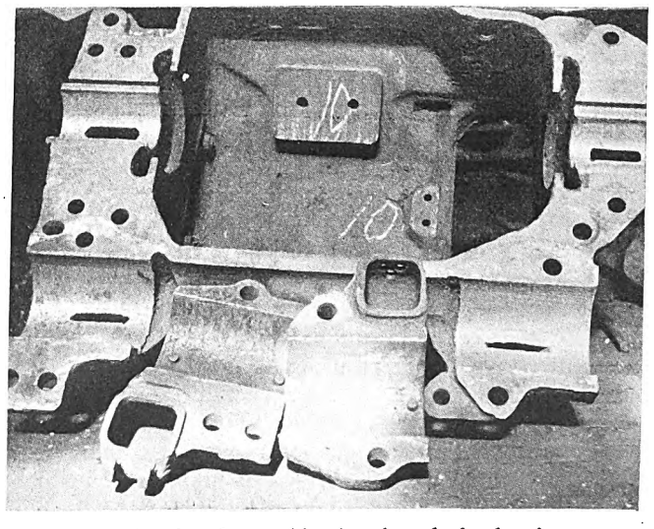
GE-80 bearing fits welded and ready for machining

Careful study was given to the fields of these motors, especially their support and painting. The field support originally supplied by the manufacturer was abandoned and a spring support substituted. This change was made to obtain a fixed tension on the field coil between the upper and lower points of contact. Prior to this change a number of field coils loosened, caused by the drying out of the insulation material. They worked about so that the insulation became worn and finally the field grounded. To install the new spring support it was necessary to cut away a portion of the old one and use it between the pole pieces and the motor frame. This had to be done to obtain the proper air gap. The remaining portion was discarded and a spring substituted that maintains a constant tension in the field coils at all times. As a result, the insulation wear caused by loose fields is eliminated.

After this field work was completed the pinion end of the motor was provided with a fixture having a pipe connection, all holes were sealed, and the same procedure followed as with the painting process on the GE-80 motors.

Overhauling of Armatures

All GE-80 armatures are inspected carefully and, where necessary, they are rebuilt complete with new shafts, coils and commutators. After an armature core



GE-80 bearing fits machined and ready for bearings

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leaves the machine shop the slots are either filed or ground smooth with an emery wheel. Next the end bells are insulated with shellacked red pressed paper. Then fabric impregnated with an insulating compound is placed over the red paper and the coil slots insulated with fish paper. After this the new coils are installed in the slots, being paraffined liberally to eliminate unnecessary pounding and prevent short circuits. A piece of fish paper is placed between the upper and lower coils, and mica is inserted at the end of the slot against the edge of the laminations to prevent the coils from being injured at the point of exit from the slot. The coil ends are then inserted into their proper commutator ears.

Heating of the commutator for soldering is done by a gas flame that is directed on a remote section. When the soldering is completed the winding is again tested for grounds, open and short circuits. The armature is next removed to the banding lathe, where temporary bands are put over the flat steel plates installed on the top of each coil. This assures that the banding pulls the coils well down into the slots. The armature is then placed in the baking oven and heated at a temperature of 120 deg. C. for three hours. Afterwards the temporary bands are removed and permanent bands put on. This method of banding draws the coils into a solid mass, preventing movement which usually results in an open circuit. After the banding, the armature is returned to the oven to be baked for four hours at a temperature of 120 deg. C. It is then taken out of the oven and placed in the banding lathe and thence revolved in a bath of insulating paint, and paint is poured liberally into the coils. After this the armature is baked for 30 hours at 120 deg. C. to evaporate all moisture. It is then fitted with new armature bearings and placed on a rack until needed for service.

This plan of motor rehabilitation has reduced our maintenance costs to a normal basis and has resulted in about 1,000 per cent increase in bearing mileage and 75 per cent reduction in electrical failures. This rehabilitation was one of the important features of the program adopted by Fisk & Roberts in resuscitating this property. Its successful outcome is recognized as an important factor in present operation, particularly the maintenance of regular schedules, and is a contributing cause of the healthy increase in patronage now coming to the cars of this company.

Some Equipment Maintenance Notes from Atlanta

WHEN controllers are overhauled in the shops of the Georgia Power Company, Atlanta, Ga., all parts are sand blasted and cleaned, after which worn parts are renewed and put in perfect condition. The sand blasting method of cleaning has proved of great advantage. Motor rehabilitation includes the cleaning and repainting of all parts. Fields are taken out and reinsulated, dipped, baked and tested. Trucks are dismantled so that all worn parts can be inspected regularly. Compressors are overhauled every eighteen months and air-brake equipment is cleaned on a six months program.

Systematic inspection of various car equipment parts is facilitated by the report and record system. Each conductor or operator makes a daily record which embraces the performance of the car from the time it leaves the carhouse until its return. The superintendent of equipment receives the statements and uses them as a basis for his inspection procedure. As a result of this method motor troubles have decreased considerably. There were but twelve in 1926 as compared with 271 in 1921, or a 95.6 per cent decrease. There were a total of 331 hot journal troubles in 1921, and but seven in 1926. Hot armature bearings have been reduced from 45 in 1921 to three in 1926.

Other interesting figures show a decrease in controller troubles to 21 in 1926 as compared with 292 in 1921. Brake slack adjusters and other improvements incorporated in the new cars have reduced brake failures. There were 397 in 1921, and only 26 in 1926. In addition to the installation of slack adjusters PV brake valves were installed and all brake cylinder packing leathers were renewed.

In connection with one-man car operation there was at first some complaint of stiffness of brake valves which was found to be due to the system of lubrication. This was remedied by the installation of Dot pressure lubricators. These were placed on top of the valve stem. On four-motor cars, line breakers and LB type controller handles have been installed, which has eliminated flashovers from the platform controller. The line breaker equipment is designed so that the controller handle must be stopped on the first point during acceleration. Aluminum cell-type lightning arresters have replaced gap-type arresters and have reduced damages from lightning from 1533 in 1921 to 0 in 1926. Behind this 100 per cent new car and rehabilitation program is a thoroughly modernized car shop.

Recently, a new method of car cleaning has been introduced by which the units are cleaned without the necessity of bringing them into the carhouse. Cars are dry wiped instead of being washed and waxed. Commencing with the first of 1927 the company reduced its car painting interval from 24 months to 20 months. Cars are waxed every six months and are swept and cleaned every time they return to the carhouse.

Additional saving has been brought about by installing Economy meters on all units at an installation cost of $27,000. Operation was begun in February, 1926, which resulted in saving of energy at the car of 2,950,450 kw.-hr. which translated into operating expense is a saving of $30,000. During the first month that these meters were in operation, that is, February, 1926, the consumption of energy per average car-mile was reduced 4.13 per cent below the amount consumed prior to this date, and in December, 1926, due to increased interest on the part of the personnel, there was a 13.10 per cent decrease in the amount consumed as compared to the period prior to meter installation.

As another economical adjunct to the car operation, a new 12 cu.yd. sand car with a 160 cu.ft. compressor and other equipment, has been introduced. This is mounted on an old express car. The tank is filled by gravity from the dry sand bin and is unloaded by compressed air into elevated tanks or bins at the carhouse.

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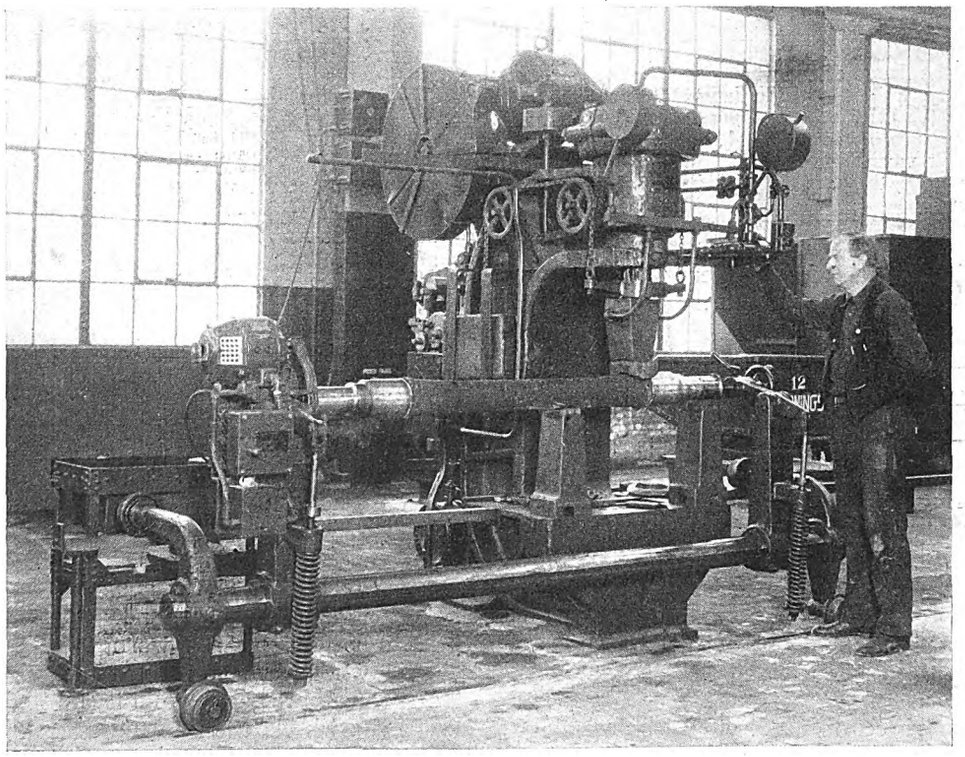
Wheel, Gear and Axle MAINTENANCE in Brooklyn*

For efficient maintenance of these parts on the Brooklyn-Manhattan Transit lines, the most modern machine tools have been installed in the Coney Island shops. Careful grouping of machines eliminates rehandling

By Clarence W. Squier
Associate Editor *Electric Railway Journal*



Every axle that does not go to the grinding machine for truing is tested at the 200-ton hydraulic press. If bent, this machine provides a quick means for straightening

DUE to the large volume of wheel, gear and axle inspection and repairs on most electric railways, and to the necessity for repeating maintenance operations continually, the work is placed on a production basis more often than other railway maintenance procedures. As a result it is quite common to find wheel and axle work done in sections of the shop set apart for this purpose. The wheel press, boring mill, axle lathe and wheel lathe universally used for this work are usually grouped to eliminate unnecessary handling. With the advantage of a new shop at Coney Island with new machine tools, the mechanical department of the Brooklyn-Manhattan Transit lines has been able to perfect a most effective department for this work.

The wheel and axle department occupies a section of the shop 60x200 ft. Not all of the machine tools for which space is provided have been installed, but when completely equipped the department will include the tools listed in the accompanying table. A large section just east of the shop provides convenient open departmental storage for wheels, axles and shafts. This material is handled by overhead electric crane and electric crane trucks through doorways directly to boring mills or lathes for the machine work. Mounted wheels that come from the truck overhauling or repair departments are handled by overhead crane and enter and leave the section at the wheel lathe end. The entire department is also served by a 7½-ton overhead traveling crane, while groups of machines have jib cranes, there being four of these in the department, each having an 18-ft. boom.

Handling Reduced to a Minimum

The number of times that wheels and axles are handled and the amount of handling equipment has been kept to a minimum by particular attention to location and grouping of machines. Wheel boring is done in the central

**This is the third article on methods used and equipment installed in the Coney Island shops of the B.-M.T. Corporation. Others were "Truck Overhauling," published April 21, 1928, and "Intermediate Truck Repairs," published May 5, 1928.*

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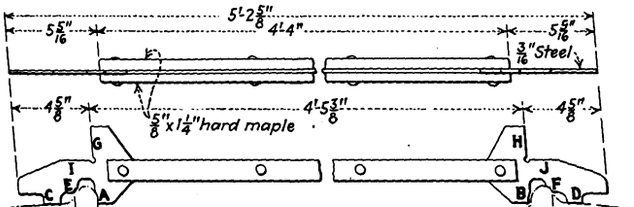


Wheel mounting and check gage

When mounting new or newly turned wheels after one wheel is pressed into position, the stop *A* or *B* of the mounting gage is placed against the inside of the flange of the wheel pressed in position and the corresponding tread stop *C* or *D* against the tread of the wheel. The second wheel is pressed onto the axle until the opposite tread stop comes in contact with the tread with the corresponding gage point *E* or *F* in contact with the outside of the flange.

For mounting partly worn wheels after one wheel is pressed into position, the stop *G* or *H* of the mounting gage is placed against the side of the flange of the wheel with the corresponding surface *I* or *J* resting on the top of the flange. The second wheel is then pressed onto the axle until the opposite stop *G* or *H* comes in contact with the inside of the flange of the wheel.

In checking wheels when both stops *C* and *D* will not rest on the treads of the wheels, they are out of gage.

part of the section. Each of the Sellers 48-in. car wheel boring machines has two built-in jib cranes. While one wheel is being bored another is picked up and held in position by one of the cranes to be swung on to the table of the mill, as soon as the boring of the wheel in the mill is completed. The other jib crane with the previously finished wheel in suspension deposits it on a truck placed alongside.

From the boring mill, wheels to be mounted on axles go to the Chambersburg Engineering Company double-acting, 400-ton, hydraulic wheel press. This machine is used also to press gears on and off. The double pressure heads make it possible to dismount both wheels from a trailer axle without the necessity of removal, after one wheel is pressed off, in order to turn the axle for pressing off the remaining wheel.

Hydrograph chart records are kept of each pressing-on operation. These are numbered consecutively for each day's work, and a notation is also made on each record of the wheel number, the man that fitted the wheel, and the diameter of its bore. Each day's records are put in an envelope and filed by dates. If it is necessary to consult the records for a particular wheel pressing later, the truck overhauling report furnishes the date wheels were changed and number of the wheels. The hydrograph records for that date with wheel number identify the particular operation. In addition, a book record for each pressing is kept at the press. When filled these books are filed.

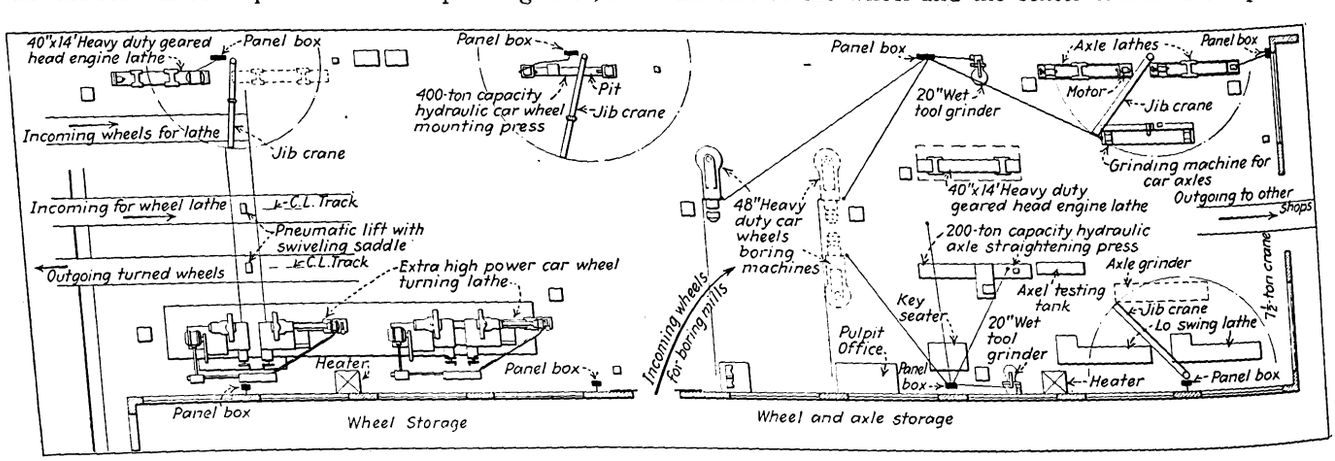
Subway motor axles have a seat for wheels $7\frac{7}{16}$ in. to $7\frac{5}{16}$ in. in diameter, and trailer axles have a wheel seat of $6\frac{1}{2}$ in. to $6\frac{3}{8}$ in. in diameter. Pressures for forcing wheels on must be not less than 75 tons nor more than 95 tons for motor axles, and between 70 and 90 tons for trailer axles. The wheel seat for a standard subway axle may vary 0.001 in. plus or minus. Wheels are bored 0.001 in. per inch of diameter smaller than the axle. This gives a pressing-on pressure of from 10 to 12 tons per inch of diameter. Complete information regarding wheels and axle fits for the different equipment in operation, pressing-on pressures, mating of wheels, scrapping diameters, etc., is furnished the wheel and axle department in blueprint form.

Machine Tools for Wheel and Axle Section of Coney Island Shops

Two extra high power wheel turning lathes.
Three 48-in. heavy-duty wheel boring machines.
One 400-ton hydraulic wheel-mounting press.
One 200-ton hydraulic axle-straightening press.
Three 40-in. x 14-ft. heavy-duty geared-head engine lathes.
Four 8-in. LoSwing axle lathes.
Two 12x96-in. grinding machines for axles.
One external key seater.
Two 20-in. wet tool grinders.
One axle-testing stand with tanks.

In mounting wheels it is the practice to have both wheels on the same axle of the same tape size. A special type of gage is used for gaging wheels. This has one side for gaging new and newly turned wheels and the other for gaging partly worn wheels. New and newly turned wheels are gaged from throat to throat, while worn wheels are gaged from back to back.

As the wheels used on the rapid transit motor axles have diameters ranging from $30\frac{1}{4}$ in. to $34\frac{1}{4}$ in., and gears have outside diameters of 25 in. to 27 in., it is possible to support the wheels at the rim for pressing off. A circular yoke has been supplied by the manufacturer of the press to go over the outside of the gear and fit between the rim of the wheel and the center frame of the press,



Layout of machine tools and equipment for the wheel and axle department of the Coney Island shops, Brooklyn-Manhattan Transit Lines

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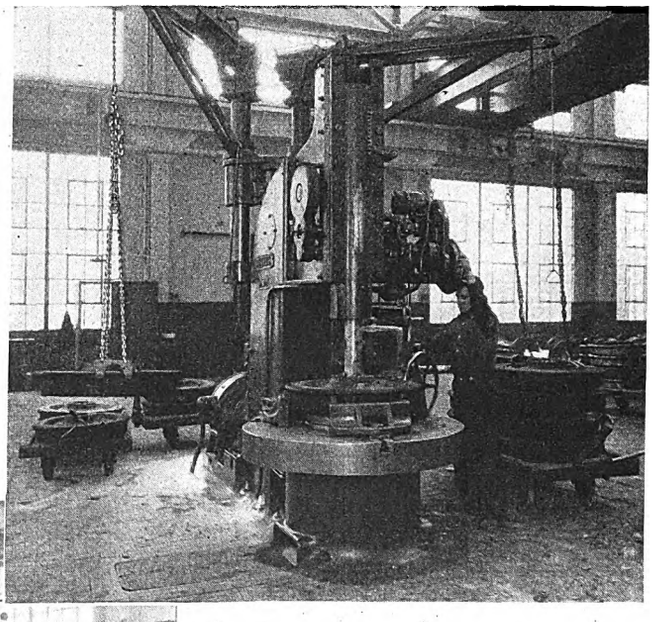
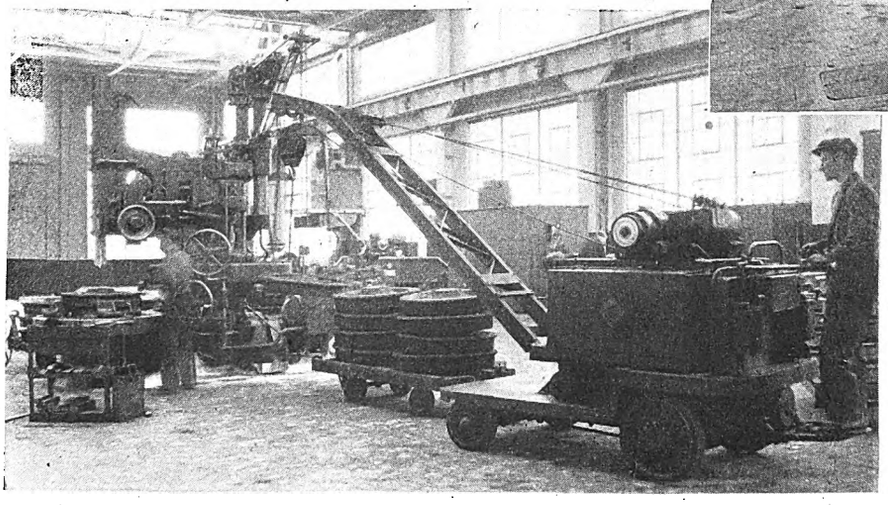
during the pressing. The yoke is suspended from a pipe framework with a roller support so it can be put into position or swung out of the way easily by the operator.

The Brooklyn system was a pioneer in the use of steel wheels for electric railway service, adopting them in 1905. Excellent results and substantial economies have been obtained. By concentrating all wheel and axle work at one point, under the direction of one man, every mile of service consistent with safety is obtained from the wheels.

Checking for Wear Systematized

The different maintenance foremen are expected to see that the wheels are worn to, but not below, the various scrapping dimensions which are furnished them in blueprint form for their guidance. New wheels for subway motor axles are 34¼ in. in diameter and can be worn to 30¼ in. Subway trailer wheels are of 31 in. diameter when new and can be worn to 27 in. When the wheels removed from the trucks are received in the wheel shop, they are checked carefully with gages to ascertain dimensions and defects. An inspector also checks the axles carefully and measures them to determine whether truing up is needed and also to make certain that the bearing fits on the trued-up axles are above the scrapping limit. If a bearing fit will not true up above scrapping dimensions the inspector paints it red and the wheels and axle are routed to the wheel press for removal of the wheels. The same inspector who inspects bearing fits also determines whether the wheels can be returned to service and indicates any work that is necessary. If it is found that the wheel will not true up to ¼ in. above the scrapping limit it is marked for removal.





At top—Boring out a subway wheel. The wheel suspended from the crane on the left is ready to be swung into position. A truck at the right receives wheels after they are bored. The crane at the right handles finished wheels

At left — A truck load of finished wheels being taken away from the boring mill by an electric crane truck

For steel wheel maintenance work the wheel lathe is an important and busy tool. At present, one high-powered lathe is doing the work. This was supplied by William Sellers & Company, Philadelphia, Pa. Three pairs of wheels per hour are turned out, on an average . Handling of the wheels is speeded up considerably through the use of pneumatic floor lifts and a hoist which forms a part of the lathe. The lathe has two turret tool posts, each arranged to hold four tools. There is a roughing tool for the wheel tread, a flange roughing tool, a combined tread and flange finishing tool, and a chamfering tool. The lathe swing is 42 in. and a ⅜-in. cut can be made at high speed. Through the use of an efficient clamping arrangement, wheels can be removed and new ones put in place for turning in two minutes. Only one man and a helper are assigned to the lathe. The helper assists in wheel handling, sweeps up chips, oils the machine, takes wheel measurements and does other work necessary while the wheels are being turned.

The wheels are rolled directly into position in the lathe on a track. Crossing this at right angles are two tracks used for the incoming and outgoing mounted wheels. There are two pneumatic floor lifts, one in the center of each crossover. The helper rolls a mounted pair of wheels along the incoming track to the crossover, steps on a button controlling the valve to admit air to the hoist cylinder of the lift, and the plunger raises the wheels free of the track. The wheels are rotated a quarter turn and then are lowered to the track leading to the lathe. The action is reversed to remove a pair of wheels after turning. This has proved a very easy and quick method for serving the lathe.

Each axle is carefully inspected and tested to detect any minute cracks that would be liable to result in breaking later. The axle, with its wheels in position, is wet with a bath of kerosene while on a test stand. The axle is then wiped dry and is painted with a paint of lime in a solution of one-third alcohol and two-thirds water. The alcohol causes the mixture to dry quickly. After numerous tests, this proportion was found to give a smoother coating than any other combination or composition. A crack retains some of the kerosene. This penetrates the lime coating quickly and leaves a brown discoloration so that detection is easy. Axles without wheels are dipped in kerosene and then wiped dry and painted with the lime. An accompanying illustration shows a crack at the end of an axle that was detected by this method. To get

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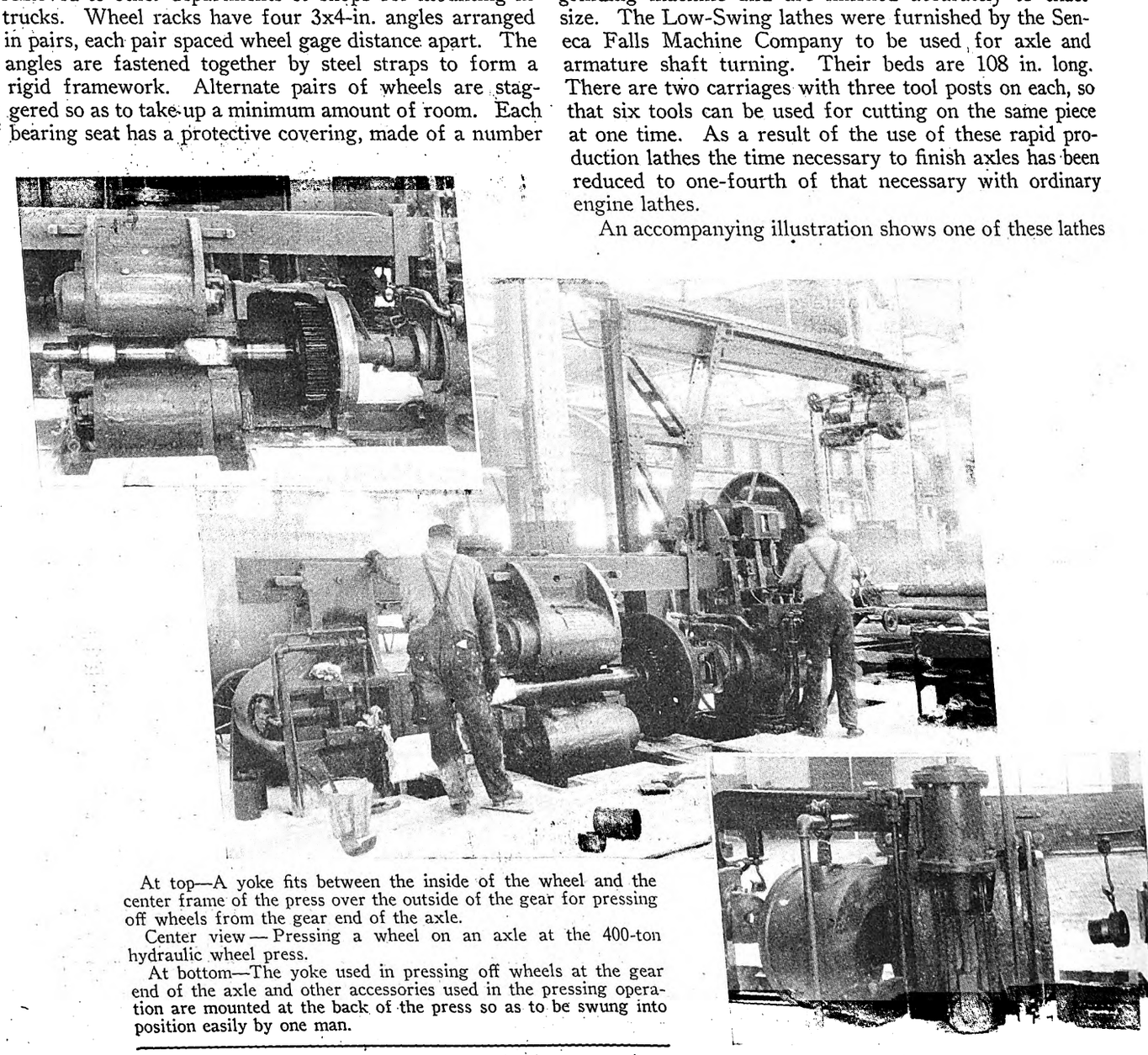
an idea of the depth of the crack the axle was turned down to the different diameters shown. Since this method of inspection was adopted no axles that have undergone this test have broken in service. It has been in use about 1½ years. After testing, axles with wheels mounted are stored on racks to keep them off the floor until they are removed to other departments or shops for mounting in trucks. Wheel racks have four 3x4-in. angles arranged in pairs, each pair spaced wheel gage distance apart. The angles are fastened together by steel straps to form a rigid framework. Alternate pairs of wheels are staggered so as to take up a minimum amount of room. Each bearing seat has a protective covering, made of a number of wooden strips strung on small ropes. Each strip is about 1 in. square and of a length sufficient to cover the bearing surface. By tying the loose ends of the ropes together the covering is held securely.



At top—A yoke fits between the inside of the wheel and the center frame of the press over the outside of the gear for pressing off wheels from the gear end of the axle.

Center view—Pressing a wheel on an axle at the 400-ton hydraulic wheel press.

At bottom—The yoke used in pressing off wheels at the gear end of the axle and other accessories used in the pressing operation are mounted at the back of the press so as to be swung into position easily by one man.

Bearing seats which are worn tapered, out of round, cut or have rough fillets are turned in a gap lathe. For this work with wheels in position, two heavy duty American 24-in. by 14-ft. geared head engine lathes are used. The bed of the lathe has two gaps for the wheels, the swing in the gaps being 40 in. Each lathe has two carriages, one with two tool posts. With this equipment the two motor suspension axle bearings and one-truck journal bearing can be trued up at the same time.

New axles have bearing seats ¼ in. in the rough over size when received from the manufacturers. They are turned and ground to accurate sizes in the wheel and axle department. For this work there are two groups of three machines each. In each group there are two 8-in. Low-Swing axle lathes and one 12x96-in. grinding machine. Bearing fits are turned in the lathe to a size 0.015 in. to 0.018 in. larger than standard. They then go to the grinding machine and are finished accurately to exact size. The Low-Swing lathes were furnished by the Seneca Falls Machine Company to be used for axle and armature shaft turning. Their beds are 108 in. long. There are two carriages with three tool posts on each, so that six tools can be used for cutting on the same piece at one time. As a result of the use of these rapid production lathes the time necessary to finish axles has been reduced to one-fourth of that necessary with ordinary engine lathes.

An accompanying illustration shows one of these lathes turning a large subway car axle. The various finished fits for this type of axle are, journals 5x9 in., dustguard surfaces 6⅛x2 in., wheel fits 7 7/16x6½ in., gear seats 7½x6⅛ in., and axle bearings 6½x12¾ in. The total length of the axle is 7 ft. 1 in. With the improved lathe equipment this size axle is turned ready for grinding in an average of three hours. With the single-tool lathe ordinarily used, the machining operations on an axle of this size would require at least three hours for rough finishing, and an additional nine hours for finishing cuts. Previously two different lathes were used, one for roughing and the other for finishing, so it was necessary to change the axle from one to the other.

In addition to provisions for multiple tools cutting simultaneously, this type of lathe has a geared headstock

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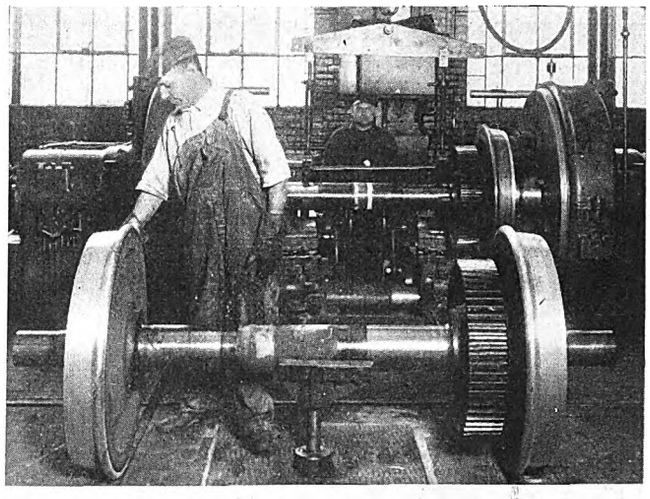
providing for six spindle speeds and a geared feed with nine changes. The geared headstock is rugged, so as to withstand the severe strain imposed upon it when several tools are taking heavy cuts. The clutch for starting and stopping the machine is on the driving pulley shaft and is operated by the shifter rod placed above the table. In order to obtain rigidity the tool holders are clamped directly to the carriage casting itself, which, in turn, bears directly on the bed of the lathe. This eliminates numerous intervening parts in the supports for the cutting tools and avoids possibility of vibration. The cutting tools do not extend across the bed of the lathe, so that the carriage can be run past the tailstock or back rest without moving the tools from their position. A geared pump built into the head of the lathe provides a continuous flow of cutting compound. The volume of axle work in the Coney Island shops permits the lathes to be kept busy continuously.

Finishing of axles by grinding, which is coming into quite extensive use, has been adopted in the Brooklyn shops. Landis 12x96-in. grinders are used. There is a saving of approximately 25 per cent in the time taken to finish axles as compared with that when they are finished in a lathe. There is also greater accuracy of dimensions and smoothness of finish, so that longer life of bearings results. Where wheels or gears are to be pressed on axles, the grinding finish produces more uniform pressure for the pressing and the grinding finish eliminates irregularities common with filing or rolling, so due to the smoother surface there is a better fit and more surface area in contact between the wheel bore and the axle. This method is also of advantage in producing a better fit of bearing so that the pressure per square inch is reduced. As the pressure employed in grinding is not great, there is little danger of particles of emery becoming embedded in the surface of the axle, and all loose particles are washed away with the heavy flush of water used. Axles without wheels that have surfaces to be trued up go to the grinding machine. Those with wheels mounted go to the gap lathes for truing.

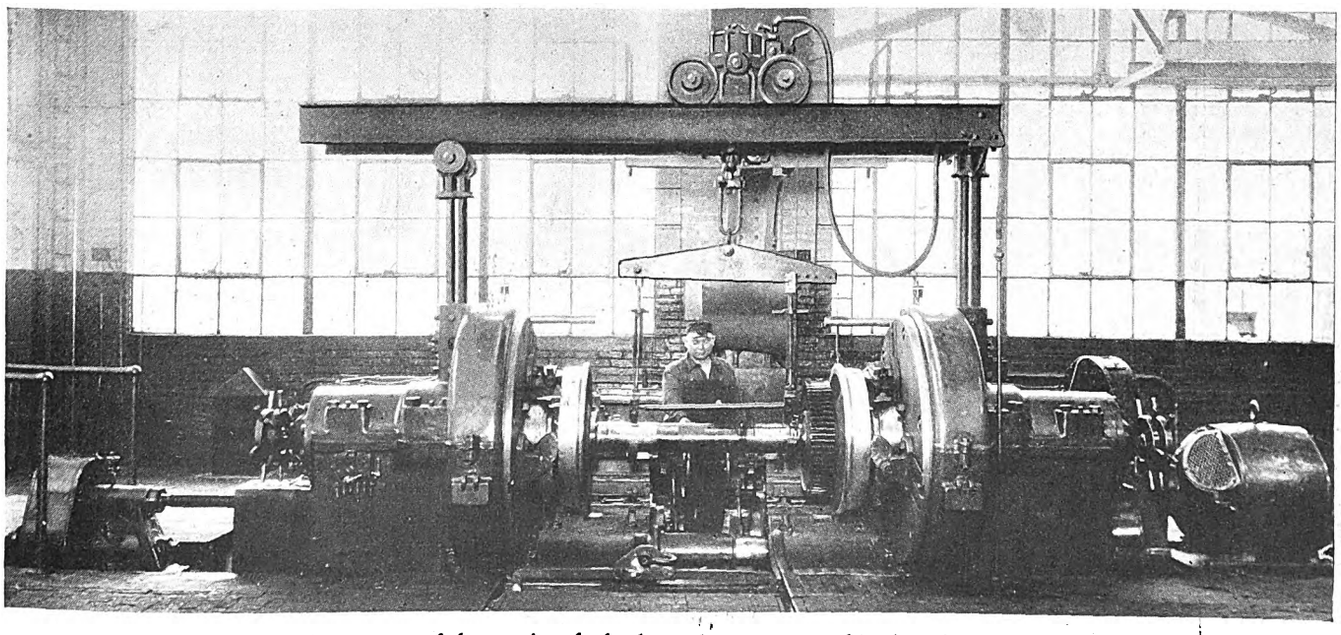
The 200-ton hydraulic axle-straightening press forms an important part of the equipment for the axle section. Every axle without wheels that does not go to the grinder goes to this test machine to determine if it is bent. If so, the straightening becomes an added part of the maintenance procedure.



Pneumatic floor lifts provide a convenient means for turning wheels from the incoming and outgoing tracks to that serving the wheel lathe

Besides the machine tools, the axle section contains a large number of portable axle racks. Each will hold seven axles with gears mounted and they are placed at convenient locations so that the jib crane which serves one of the various machines can deposit an axle in one of these racks after it is turned and is waiting to go to the grinding machine. After grinding the same jib crane handles the axle to another rack, or an individual axle can be picked up by an overhead traveling crane and taken to another section as desired.

These axle racks are constructed of angles and channels. The ends form a triangle. Two 12-in. channels form the top portions of the ends. To these, 6-in. angles are riveted to form the support for the ends of the axles. To prevent injuries to the axles the faces of these angles are covered with $\frac{1}{8}$-in. copper. Gusset plates strengthen the framework at all corners. The complete rack is 5 ft. wide and 8 ft. long. The bottom framework is constructed of 4-in. angles, with a plate at each corner. These are 6 in. wide and $\frac{1}{2}$ in. thick and have holes so that tackle can be fastened to lift the entire rack with load by



An average of three pairs of wheels per hour are turned in this wheel lathe

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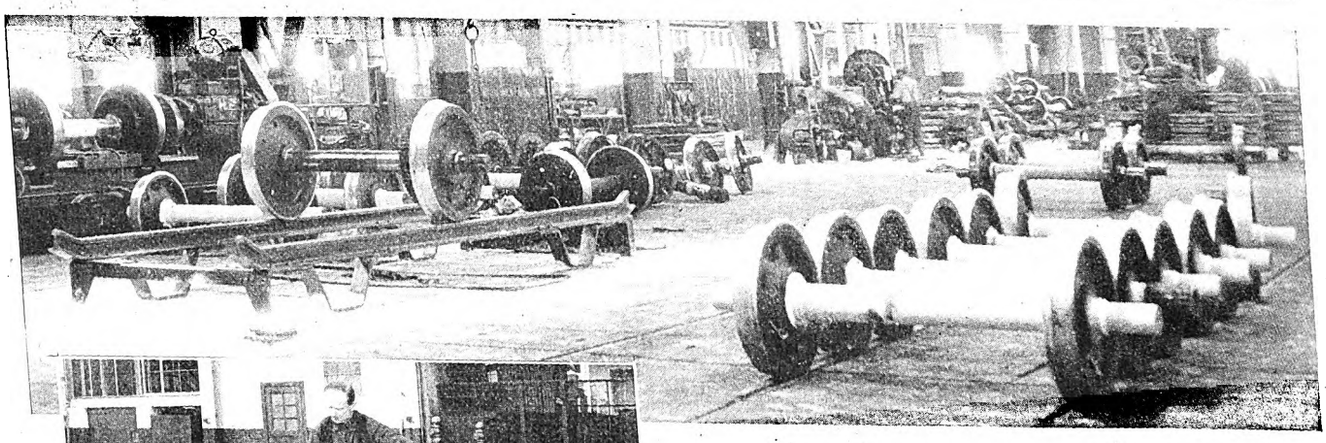
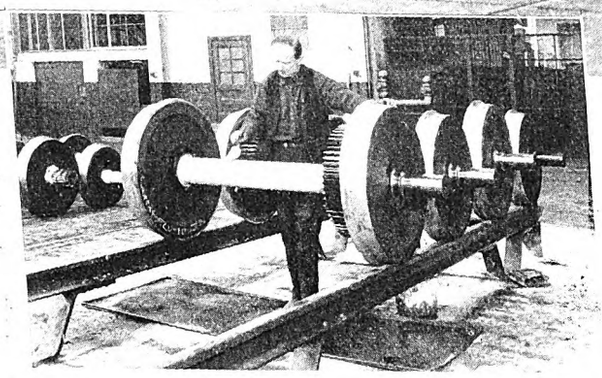
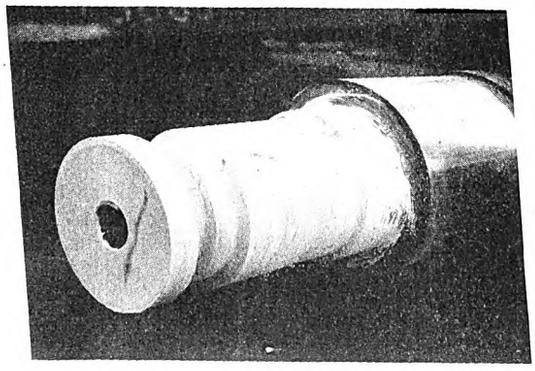
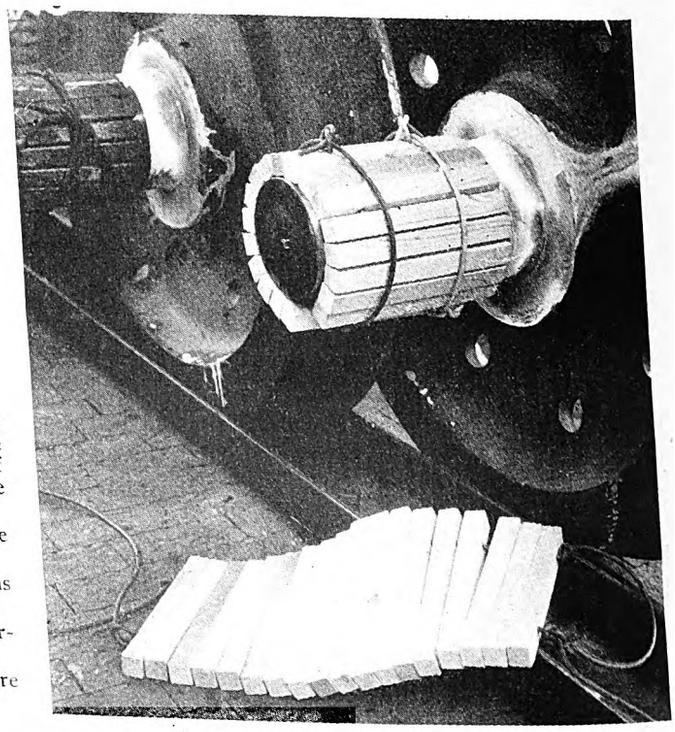




Rapid Transit Service Requires Careful Checking and Testing of Wheels and Axles





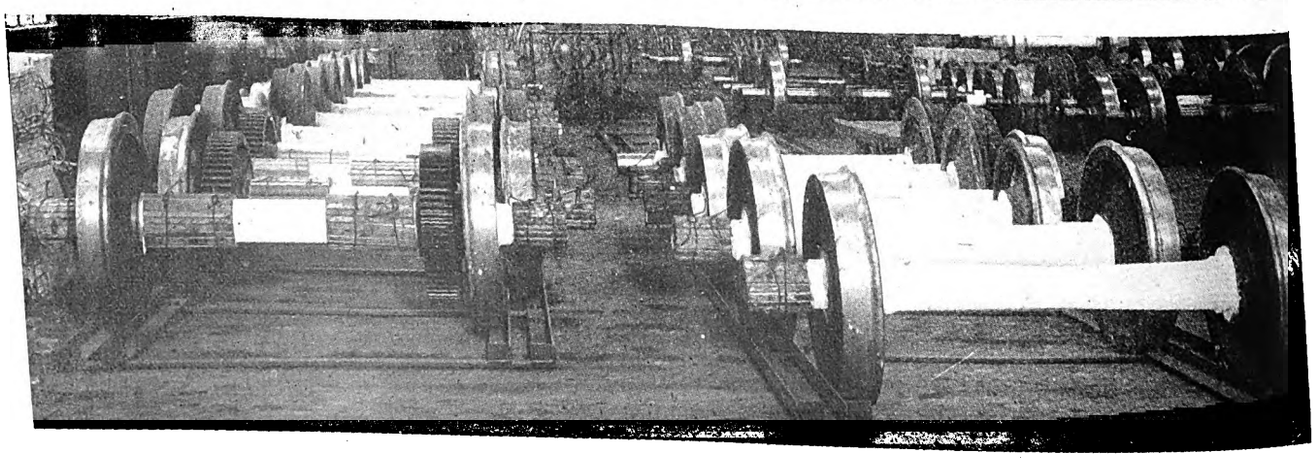
At top—All axles are tested carefully for cracks before being sent out from the wheel and axle department. The axle of the pair of wheels on the stand at the left has just received a bath of kerosene. Axles of mounted wheels on the track at the right have been painted with lime as the second operation of the test.

Second view—Painting the axles of mounted wheels with lime on the test stand.

Third view—Crack at the end of an axle. The turned sections show the depth and width of the crack at different depths.

The bearing fits of axles are protected by wooden strip coverings. These are shown at the right.

View at the bottom shows mounted wheels ready for service are placed on racks to keep them on the floor.



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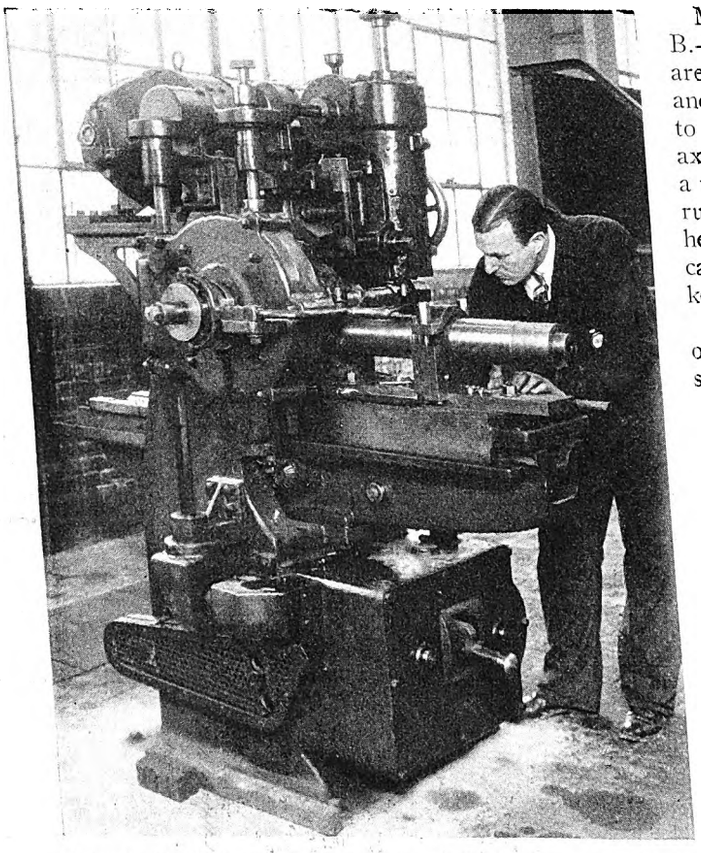

An external keyseater for armature shafts forms a part of the equipment of the wheel and axle department

an overhead traveling crane if desired. As the racks are fitted with wheels they can be moved with their load of axles. The wheels are of 8 in. diameter and have a 4-in. face. The front axle is constructed of a 4-in. I-beam and has a center bearing and circular side bearings so that it can swivel for turning sharp corners and moving about.

Maintenance work on wheels and axles for the entire B.-M.T. lines is done at the Coney Island shops. There are three other shops where wheels and axles are removed and installed. A wheel supply flat car makes daily trips to and from the shops. Handling of wheels mounted on axles at the Coney Island shops is facilitated by providing a track into the wheel and axle section so the car can be run inside and loading and unloading done with the overhead traveling crane. The top of the wheel supply flat car has wooden blocking bolted permanently in place to keep wheels from rolling while in transit.

The wheel and axle section also does the finishing work on new armature shafts. A Mitts & Merrill external key seater is used for cutting keyways in shafts.

Rails Replaced Without Disturbing Ties

By W. L. Lewis
Engineer Erie Railways. Erie, Pa.

IN THE summer of 1927 the Erie Railways found that the rails on West 18th Street, Erie, Pa., needed replacing while ties, paving, etc., still remained in good condition. This track had been rebuilt in 1915 on a 5-in. solid concrete base with a new 4-in. wire-cut lug brick pavement. At that time all new material was installed except the rail, which was relaid after the ends were cut off. After considering cost of reconstructing this stretch of track it was decided to remove the old rail and lay other rail in its place on the existing substructure. Due to several small abandonments of track the company had some very good 7-in., 80-lb. plain girder relayer rail on hand which it decided to use.

The work as carried out consisted of first digging a trench on each side of the rail. The old rail was removed and all dirt was cleaned out. The ties were also

A convenient departmental storage for wheels and axles speeds up production. Material can be brought in on a car and unloaded by the overhead 7½-ton traveling crane. Wheels are loaded on small trucks and taken to the wheel and axle department by electric crane trucks

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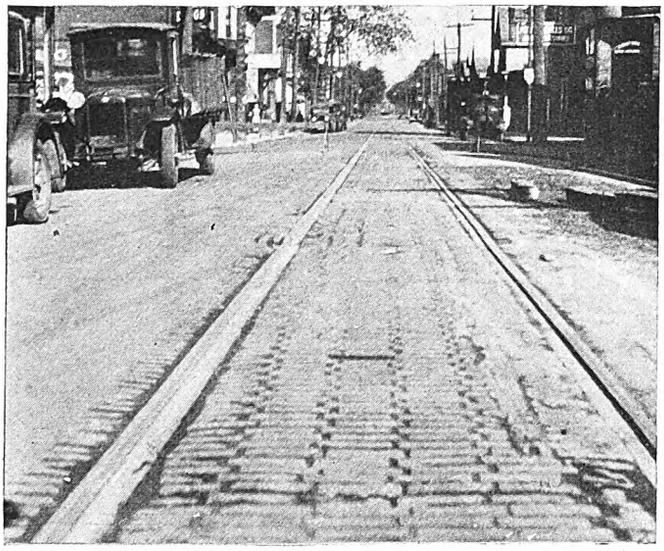
cleaned carefully and where mechanical wear showed at the joints they were adzed carefully to a true surface. Upon the clean ties 8x12x3-in. white oak blocks S-2-S were laid with staggered holes drilled for spiking, the staggering being reversed from the original. A special cut spike was used $8\frac{1}{2}$x$\frac{5}{8}$-in. instead of the $5\frac{1}{2}$x$\frac{9}{16}$-in. standard. This gave the same length of spike in the tie and as the ties were all in first-class condition and to a perfect surface the rail lined up advantageously.

After the track was lined up and spiked thoroughly amesite was tamped with bar tampers under the base of the rail between the ties. Then by the use of 2x6-in. forms to keep the concrete away from the rail, the excavated portion was filled in with concrete to within 5 in. of



Track on West 18th Street before reconstruction was started

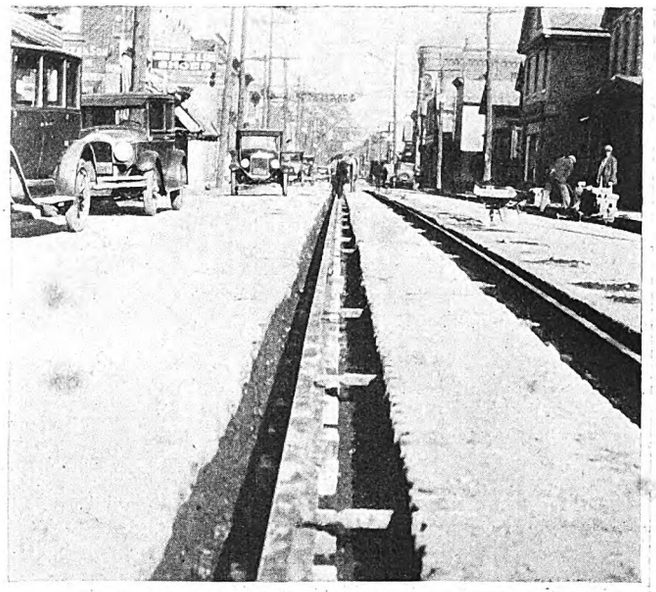
the top of the rail except a portion about 7 in. wide, which was kept open to the base of the rail by the forms. This was filled in with amesite after the concrete had set and was bar-tamped thoroughly to the top of the rail. After this the whole top surface between the rails and to the pavement outside the rails was filled with amesite and rolled. The ties cut their own flangeway.

This job was watched closely during the past winter, which was exceptionally unfavorable for track construction, there being heavy snows with sudden thaws and freezes. Together with the adjoining pavement the work has stood up well and a considerable amount of this type of reconstruction is contemplated during the coming season. The accompanying table shows the cost of the reconstruction:

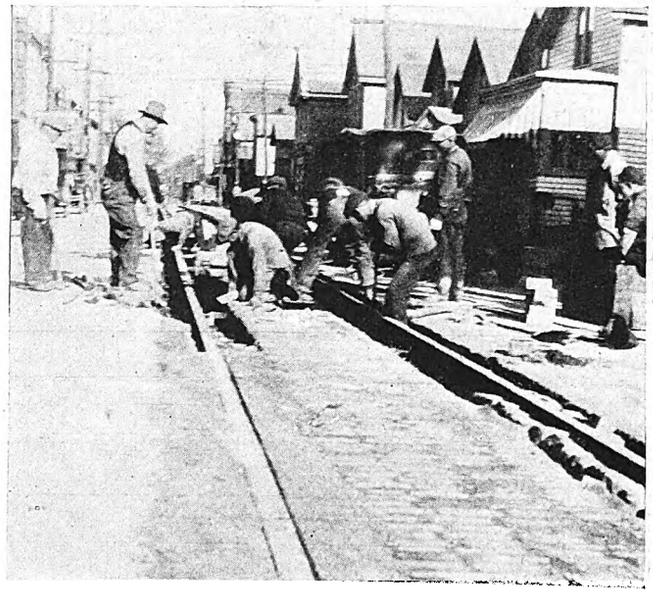
COST OF RECONSTRUCTING TRACK ON WEST 18th STREET, ERIE, PA.

Class of Work	Cost	Class of Work	Cost
Grading	$403.34	Paving	1,379.59
Ties	268.32	Miscellaneous	21.20
Rails, etc	859.16		
Track labor	256.26	Total	$3,187.87

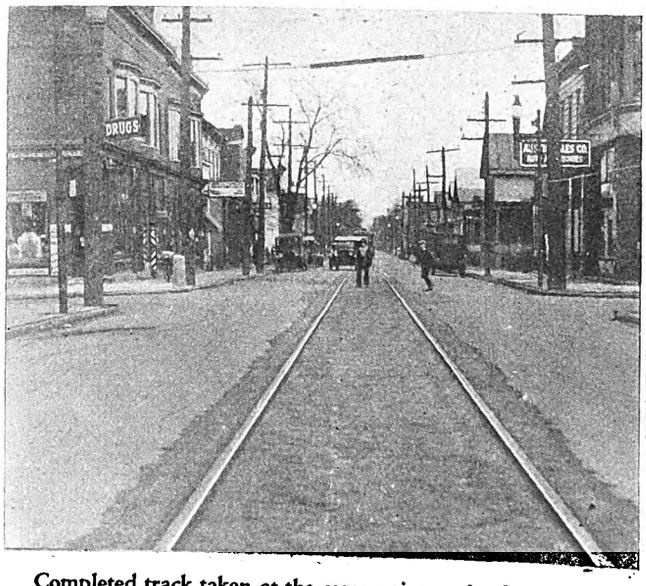
The item for paving in the table appears high. This is because the cost of the amesite used in tamping under the rail was charged to this account. Eight hundred and fifty feet was relaid with this type of construction by nineteen men and a foreman in nine days. The cost per lineal foot was $3.75. While this is not exceptionally low for the job, it is felt that the cost is justified by the results achieved, as it is expected that at least ten years' additional life will be obtained.



Replaced rail laid and lined



Changing and shimming the rail



Completed track taken at the same point as the first picture

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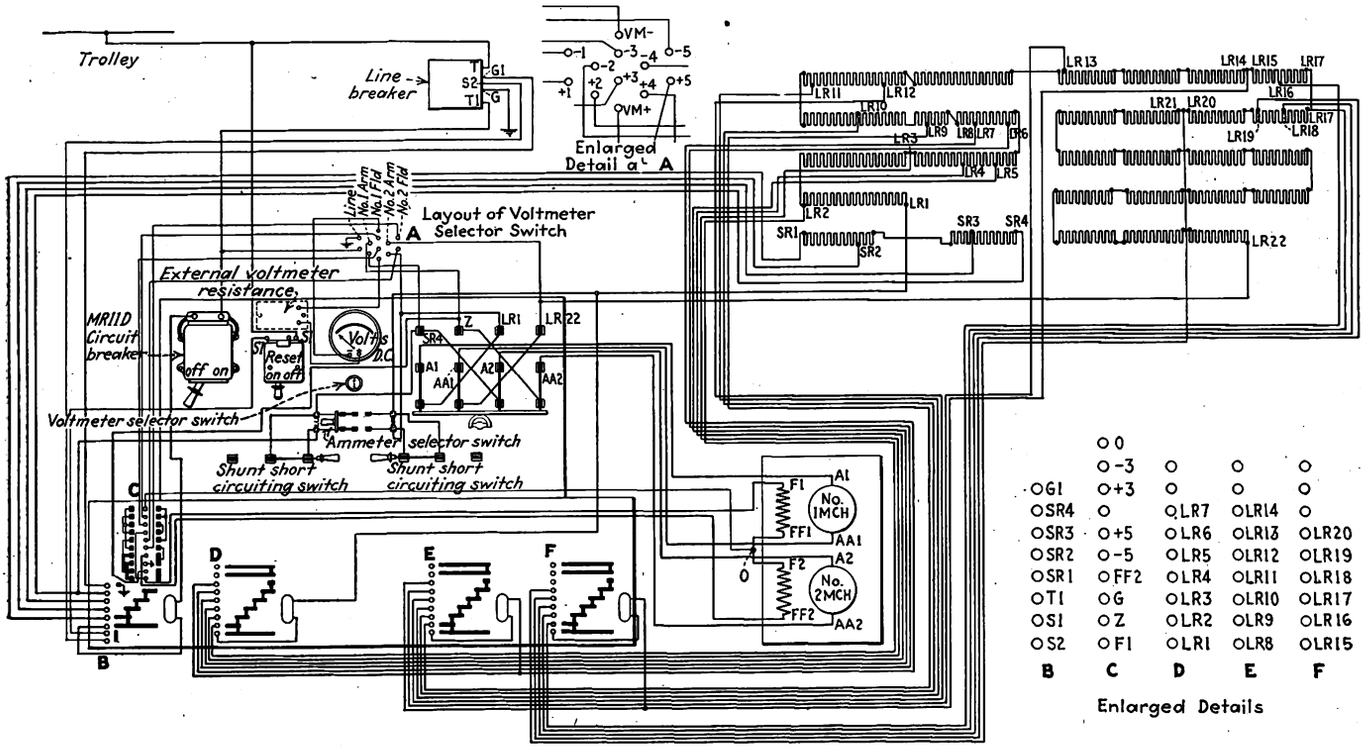
Railway Motor Load Testing Set

By A. J. Naquin
Equipment Engineer Rolling Stock and Shops Department, New Orleans Public Service, Inc., New Orleans, La.

Motors are given a running test after overhauling. Tested in pairs, one motor drives the other as a generator and so provides for convenient adjustment of load



Wiring diagram for motor load test of the New Orleans Public Service, Inc.

RAILWAY motors overhauled in New Orleans are given a load test by use of a testing set designed by the railway engineering department of the New Orleans Public Service, Inc. Accompanying halftones show the general arrangement of the apparatus and a diagram shows connections. The load for the motor under test is furnished by having it drive another motor as a generator. Motors are tested in pairs and either motor can be used as a generator while the other unit is used as a motor to drive it. The direction of rotation of either unit may also be changed at will by the reversing switch of the control.

The motors are set up for the test on a bedplate which has convenient slots for bolting and clamping the motors in position. The pinion ends of the two motors are placed together and connected by a flexible coupling. In the illustration showing the controlling switchboard in the background the loading rheostats are in the upper right-hand corner. There are four controllers in the control cabinet, the one at the left being used for starting purposes. Three steps of resistance are cut while bringing the motor up to speed. The other three controllers determine the loading by cutting out units of resistance in the generator circuit. The controller at the extreme right is used for close adjustment; with it the motor and generator current is changed by increments of 3 amp. or less.

The current flowing through either the motor or generator is indicated on a portable ammeter by throwing a double-pole, double-throw switch to either the left or the right as desired.

The voltage from trolley to ground and across each motor may be read from the switchboard voltmeter by moving the selector switch beneath the voltmeter. A line breaker for opening the motor circuit is operated by either the control switch or the ratchet switch on the starting controller. A circuit breaker in series with the line breaker gives additional protection of the motor circuit; the former being set at 50 amp. higher than the latter.

All overhauled motors having rewound armatures are tested on this set for thirty minutes at 150 per cent of the hourly rating, being run fifteen minutes in each direction of rotation. During the test, commutation is carefully checked. About 10 per cent of the motors whose armatures are dipped and baked but without other repairs are also tested. All testing is done during the regular overhauling period which is every 40,000 car-miles.

It is believed that if an overhauled motor satisfactorily passes the high current test described, and the high voltage test also given every overhauled motor, that it may be placed in service for another 40,000 car-miles without danger of failure.

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Keeping Accurate Records of Car Wheels

RECORDS of car wheels kept by the Omaha & Council Bluffs Street Railway, Omaha, Neb., have been found so efficient that out of 3,528 wheels scrapped in a period of two years less than 5 per cent lacked a completely detailed report. When car wheels are received from the foundry a shipping list which includes the serial numbers is obtained from the storekeeper. The wheels also are checked in by serial number by the stores department. In this way a double check of these numbers is obtained.

When a pair of wheels is mounted on an axle, an axle gear-wheel tag is filled out. The numbers of the axle, the gear and the two wheels that have been mounted are recorded, giving size, bore, specification number, and manufacturer of the wheel. This tag is then tied to one of the wheels and stays with the mounted pair until it is installed in a car.

When the wheels go in service, the tag is removed and the serial numbers of the wheels removed from the car are entered in the "out" column provided for that purpose, giving the reason for removal, location, date and car number, thus completing the tag. After transferring the information into the records, the tag is filed according to car number.

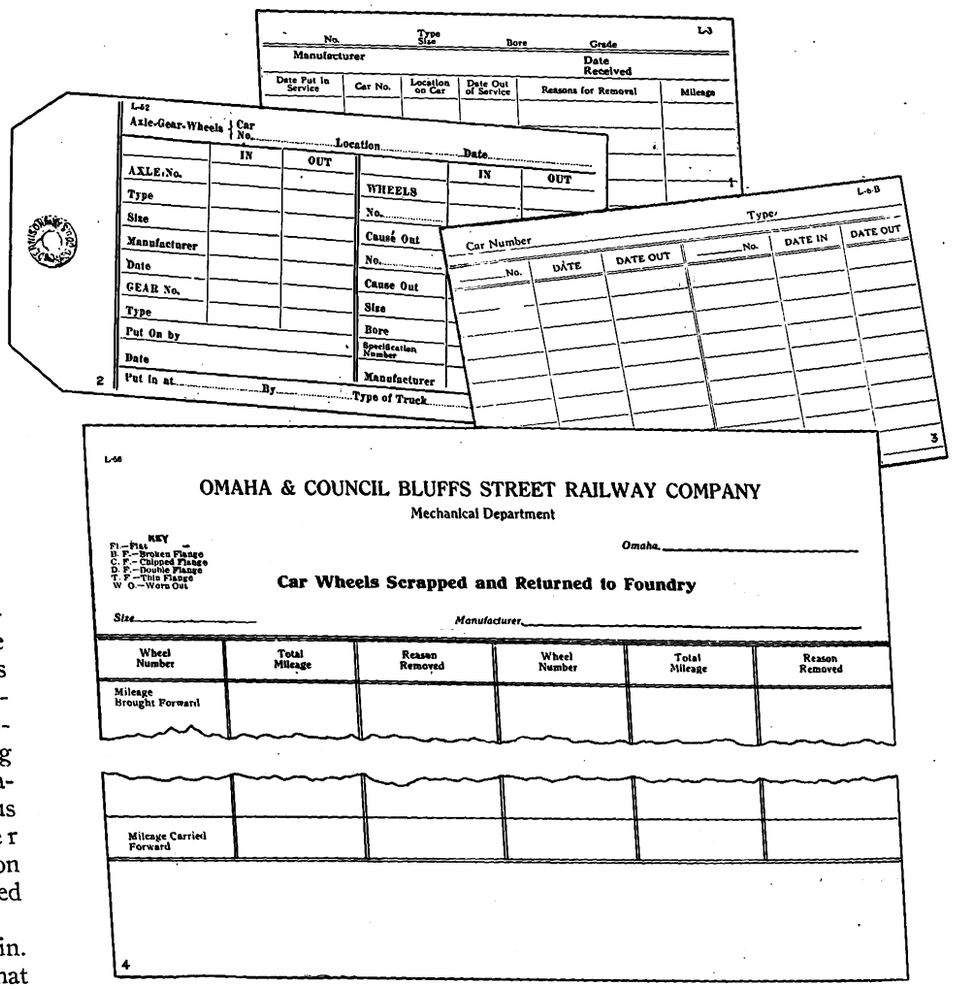
The car record, a 3x5-in. card, shows at any time what wheels are on any car. These cards are filed by car numbers. The entries for wheels installed and removed are transferred to this card from the tag.

The individual wheel record, another 3x5-in. card, shows the date the wheel is put in service, the car number, location on car, date out of service, reason for removal, and mileage. The entries likewise are transferred from the tag.

The car mileage, figured by the transportation department at each division office, is sent to the mechanical department the first of each month. The sheets show by cars the mileage by lines as well as miles per day for the month. The total mileage of each car is entered on cards which have monthly spaces sufficient for six years. These are filed numerically according to cars.

When a wheel is scrapped the wheel man reports it and an entry is made on the individual wheel card. The total mileage made by the wheel is then computed and entered on this card.

When wheels are scrapped and returned to the foundry or sold, their serial numbers are reported by the stores department. The corresponding individual wheel cards are removed from the files and entries are made on the "car wheels scrapped" sheet. This gives the total mileage of each wheel and the reason for its removal. The



These forms are used for recording complete information on the receipt, handling, reclaiming and final disposition of car wheels used on the Omaha property

1. Individual record made out for each wheel.
2. Car record showing placing and removal of all wheels.
3. This tag is attached to each mounted pair of wheels. When they are placed the information regarding the wheels removed is entered on it.
4. Record of car wheels scrapped, giving for each classification and size of wheel the mileage and reason for removal for an entire order.

MILEAGE OBTAINED FROM CAST-IRON CAR WHEELS IN 1927—OMAHA & COUNCIL BLUFFS STREET RAILWAY

Diameter, Inches	Total Wheel Mileage: Total	Number Received	Number Recorded	Mileage	Average	One-Wear Wheels: Number	Mileage	Average	Two-Wear Wheels: Number	Mileage	Average	Three-Wear Wheels: Number	Mileage	Average	Miles per Wheel After Reclaiming: Two-Wear	Three-Wear
33	1,027	37	990	50,647,836	51,159	784	40,393,263	51,522	171	8,413,182	49,200	35	1,841,391	52,611	18,656	11,719
30	268	7	261	15,254,845	58,448	227	13,358,843	58,850	27	1,580,020	58,519	7	315,982	45,140	25,679	10,277
21	436	25	411	18,733,531	45,580	281	13,245,350	47,136	111	4,782,955	43,090	19	705,226	37,117	12,565	7,429
26	104	8	96	4,151,975	43,250	58	2,712,226	46,763	34	1,304,978	38,382	4	134,771	33,693	17,179	7,269
Weighted average	1,835	77	1,758	88,788,187	50,505	1,350	69,709,682	51,637	343	16,081,135	46,884	65	2,997,370	46,113	17,091	10,036

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total mileage is computed for the entire shipment of each size of wheel.

A report is also made up each month from the tags, giving the number of wheels of each size removed from service, along with the causes of removal.

While the company at present is purchasing only steel car wheels, there are many cast-iron wheels in service on which a large mileage average has been obtained. The accompanying table gives the total mileage of car wheels which has been obtained from wheels of the several diameters used. As may be noted, in certain instances an average in excess of 60,000 miles has been secured.

Ventilated Room for Spray Painting

Two systems as used by the Leipsic Street Railways are described. One provides for a horizontal flow of air, the other for vertical flow to prevent fumes from spreading

SOME interesting provisions for spray painting adopted by the Leipsic Street Railways, Germany, were described in the Feb. 3 issue of *Verkehrstechnik*. The consolidation of two street railway companies, one with cars painted blue, the other red, brought about the necessity of repainting equipment. A uniform ivory color was adopted. To do this speedily and economically the spray method was used, since it was found that the brush method required more labor as well as greater space for an extensive job.

Nitro-cellulose lacquers were tried out first because they seemed especially suitable for spraying. Their durability did not prove entirely satisfactory and therefore an enamel system is now used.

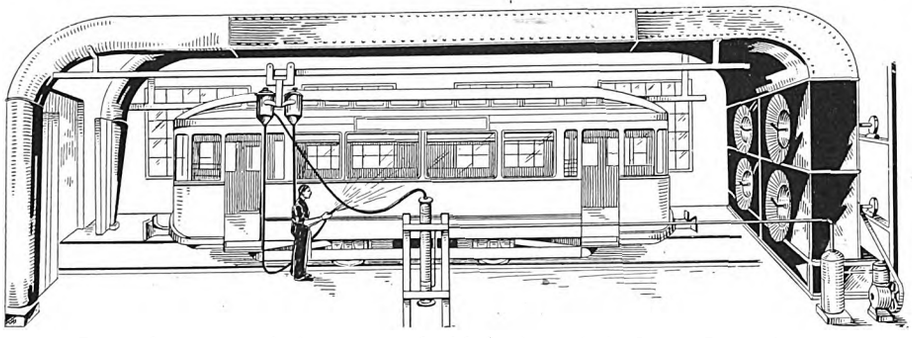
Where the condition of the old paint is such that it is inadvisable to remove the ground coat, rusty spots are first rubbed with a wire brush and then two coats of ivory-colored zinc paint are applied. After this an ivory-colored rubbing varnish is sprayed on and after sandpapering this, a coat of varnish is sprayed to complete the job. This simplified method was adopted in the belief that it is better to paint cars more frequently than had previously been the custom, since heavy street traffic and increased numbers of accidents made repainting necessary at least every two to three years.

Where cars were entirely repainted after the removal of the old paint, the time per car with the spray method was found to be 7½ hours as compared with 50 hours by the brush. Details appear in the accompanying table.

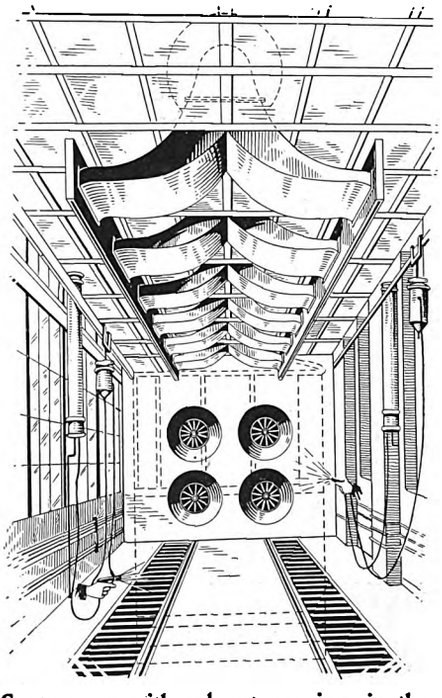
With an average wage of 42 cents per hour for the painting crew, the saving per car of average size amounted to $18. The amount of paint used was found somewhat greater with the spray method than with the brush, but this depended somewhat on the quality of paint used and the skill of the workmen.

Wooden seats were repainted by the brush method as it was found that in order to do a satisfactory job by spraying, it was necessary both to remove the seats from the cars and to use more paint. Lettering is also done with brushes.

Added facilities were provided at the shop for spray painting. This included necessary piping for connecting to the compressed air supply. Air is used at a pressure of from 37 to 52 lb. It was found that with the higher pressure there was a better distribution of paint, but a slightly greater quantity of paint was used. To protect the workmen against fumes from the paint without the use of masks, a special room with forced ventilation was built by a German firm. This has proved satisfactory for exhausting the disagreeable fumes. The special paint room is 53 ft. long and 15 ft. wide, and was erected in one section of the paint shop. Cars are run in and out through an opening at one end of the room while on the opposite end there are four exhaust fans. Each has an exhaust opening of 27½ in. A sprinkling device is also installed which sprays water in front of the fan opening, so that the particles of paint mix with the water as they are drawn out and then fall into a settling basin below the floor. In this basin the paint is separated from the water by gravity and the water is again pumped through the spraying equipment. The air drawn from the room is purified before it is led back again. The purifying of the air from paint and water is done by means of filtering, after which it again enters the room at the end opposite to that where the fans are installed.



Room for spray painting arranged with horizontal air flow. Convenient connections for compressed air are installed



Spray room with exhaust openings in the floor for vertical air flow

COMPARISON OF TIME NECESSARY TO PAINT A CAR BY THE SPRAY AND BRUSH METHODS

Class of Work	Time, Hours Spray	Brush
Covering windows	½	..
First coat of oil paint	1½	10
Two coats of ivory-colored zinc paint	2½	20
One coat of rubbing varnish	1¼	10½
One coat of lacquer	1	10
Removal of covers for windows	1	..
Total	7½	50½

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With this method ample circulation of air is provided and the workmen are not subjected to drafts because the circulation is directed so as not to inconvenience them.

Some of the advantages found with this equipment are that the exhaust fans do not become clogged with paint and there is no danger of spontaneous combustion. Paint fumes which would be annoying if exhausted into the open air, are deposited in a form so that they can be removed without being spread through the neighborhood. The temperature of the room is easily kept constant since the air exhausted is used over again and so considerable loss of heat is avoided. The paint room has its own ventilation and forced air circulation, which is entirely separate from the surrounding shop, so the sucking up of metal and other dust from the shop is prevented. This is of importance in keeping slow-drying oil paints clean.

The compressed air system for the paint room is installed on rails so that it can be shifted as desired. It has an oil and water separating device. Separate valves permit renewal of the air in the room from the outside. This was found particularly desirable in the summer months when the air outside is warm.

At another location a spray painting room somewhat similar to this, but with some modifications, was used. This is shown in the second illustration. In this fresh air enters through nozzles at the ceiling and the mixture of air and paint fumes is exhausted through slots in the floor. A water sprinkling method is used in connection with this in order to prevent the fumes from spreading. An advantage of this system is that the fans can be placed so as not to obstruct the end of the room and thus both ends can be used and cars can be moved directly through if desired. Also, in painting trucks of cars this method proved of particular advantage.

Rhode Island System Installs Frequency Changer

WORK has been in progress the past few months on the installation of a frequency changer set at the power plant of the United Electric Railways, Providence, R. I. This machine allows the interchange of power between the railway power plant and the Narragansett Electric Lighting Company's plant and further, the New England Power Company's system. This work involves an expenditure of approximately $450,000 to complete the connection. The set went into commercial operation on Feb. 14.

The frequency changer set is made up of two synchronous machines with their individual exciters all on the same shaft. One of the machines, that for the railway end, operates on 25 cycles and the other machine is made to operate on 60 cycles.

With the installation of this interconnection, the railway will have the advantage of the larger power systems in case of accidents to the machinery in their plant and likewise the power systems will receive the advantages of the generating capacity of the railway plant in the event they have trouble. The stand-by capacity of both systems can now be used for extra capacity for either.

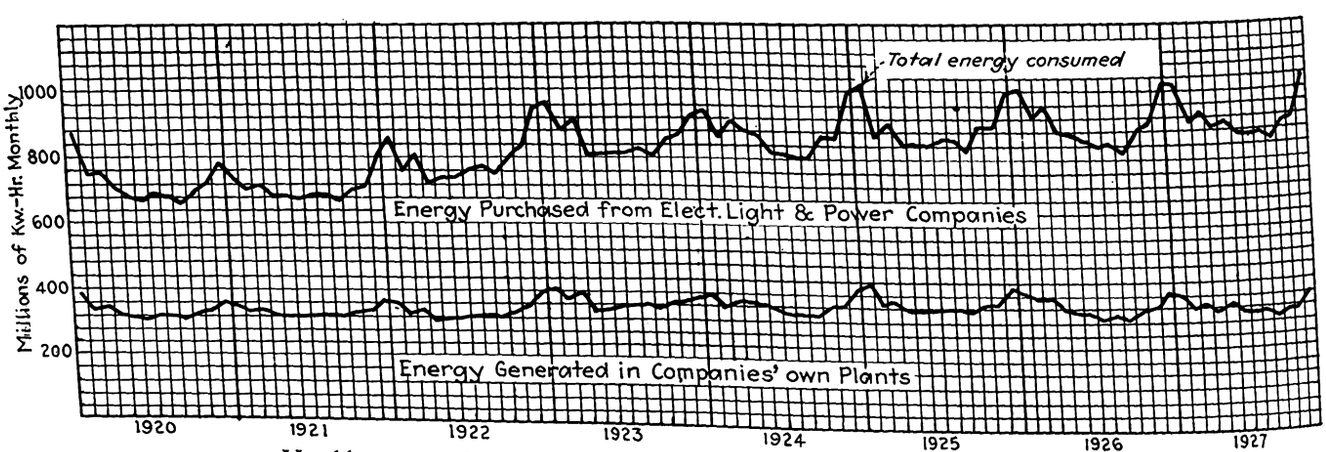
When passing power to the railway the 60-cycle energy is received through underground cables at 11,000 volts, three-phase, to the 60-cycle bus in the railway plant and thence to drive the frequency changer. This connection and the 60-cycle machine and switching equipment have a capacity of 21,000 kva. The 25-cycle machine of the frequency changer set then acts as a generator furnishing 11,000-volt, three-phase, 25-cycle, energy direct to the 25-cycle buses of the railway system. This part of the connection has a capacity of 20,000 kw.

Energy Used by Railways Increases

DESPITE the use of buses, lighter rolling stock and improved apparatus, the monthly consumption of energy used by the railways is still on the upward trend. The accompanying chart shows the monthly consumption beginning with the year 1920. This is a continuation of the chart published with a résumé of energy consumption in the Aug. 20, 1927, issue of this paper.

The chart shows pronounced seasonal peaks with apparently erratic monthly fluctuations in addition. The latter entirely disappear, however, when the curve is replotted in terms of average daily energy consumption, expressed as a per cent of the annual total. The seasonal variations are due primarily to such influences as car heating and snow removal.

Although the energy consumption for the first few months in 1927 was below that of 1926, the total for the year was greater. The total energy consumption for 1927 was 11,013,000,000 kw.-hr. against 10,970,000,000 kw.-hr. for 1926. The total energy generated in railway-owned plants has decreased from 4,371,000,000 kw.-hr. in 1926 to 4,320,000,000 kw.-hr. in 1927, while the energy purchased from central station companies has increased from 6,599,000,000 kw.-hr. in 1926 to 6,693,000,000 kw.-hr. in 1927. For the last seven years the larger portion of the steady increase in energy consumption for transportation purposes has been in the energy purchased from central-station companies.



Monthly consumption of energy in millions of kilowatt hours by electric railways

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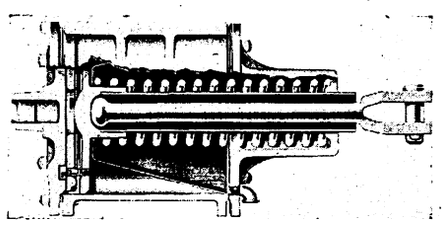
Brake Cylinder Protector

DIRT and water, which may enter at the non-pressure side of the piston, cannot reach the cylinder walls and packing, it is claimed, by using a brake cylinder protector that has been developed by the Westinghouse Air Brake Company, Wilmerding, Pa. The use of this protector should lengthen the life of packing cups, reduce leakage and decrease maintenance costs.



Brake cylinder protector

The protector consists of a conical-shaped, impregnated, canvas structure, devised so that at one end it is clamped between the cylinder body and the non-pressure head, where it functions as a gasket, while at the other end it is held in position against the piston by the release spring. Any dirt or water entering the cylinder is trapped by the protector, and the water is discharged through a drain opening provided in the non-pressure head. The protector, being flexible, collapses as the brake is applied.

Motors for Dusty Atmospheres

BOTH alternating and direct-current motors, built for use where fumes, dust or explosive gases are present, are included in a line announced by the General Electric Company, Schenectady, N. Y. The motors bear the designation "Class BU Form JA" and are totally inclosed.

The object of the construction is to reduce the danger from transmission of heat generated inside the apparatus from any cause whatever, whether it be sparking or explosion, to the outside in such intensity as to ignite any gases surrounding the equipment. The two-piece, cast-iron exterior is heavy enough to withstand the pressures of an internal explosion and has flanged joints sufficiently wide to cool the flame of any such explosion. No gaskets are used, as it is not intended that the motors should be gastight.

The internal mechanical and electrical features follow standard General Electric design. The electrical characteristics are primarily the same as those of standard totally-inclosed motors. The alternating-current motors are available in single-phase ratings up to 3 hp. and, in polyphase ratings up to 15 hp., at standard voltages and the more popular speeds. The direct-current motors may be either shunt or compound-wound types with the horsepower ratings from $\frac{3}{8}$ to 5 hp., also at the standard speeds and voltages.

All of these motors, either alternating or direct-current types, are designed to operate within a temperature rise of 55 deg. C., the standard for inclosed motors.

Dick Prescott Appoints an Assistant

and Surprises a Friend

DICK PRESCOTT, newly appointed superintendent of equipment of the Consolidated Railway & Light Company, finally found himself alone at the desk over which Tom Mullaney, retiring superintendent, had conducted the affairs of the Consolidated shop for many years. Mullaney's announcement of Dick's appointment as his successor had been gracious and helpful. Dick had managed, somehow, to respond to the congratulations and good wishes that were heaped upon him both by Mullaney and by the several foremen of the shop departments. Finally he was alone.

As Dick meditated for a few moments on the rapid succession of events during the past two days, he marvelled at the sudden turn with which the wheels of destiny had elevated him to a position of power and responsibility. Dick felt humble indeed as he thought of the group of foremen who had just pledged their support and co-operation. Some of them were many years his senior in age and in experience. Nevertheless, they had all recognized his leadership and his right to succeed Mullaney as head of the department.

After the foremen had left Dick consulted with Mullaney regarding an important matter which he had been turning over in his mind. Mullaney had approved heartily and Dick was now about to take his first official step as head of the department. He meditated a few minutes longer as he sat alone in the superintendent's office. Then he smiled quietly to himself as he reached for the telephone and called Steve White, carpenter shop foreman under whom he had started his apprenticeship in the Consolidated shop. Dick asked Steve to come into his office, and in a few minutes his old friend was ushered in by Miss Stevens.

Dick smiled cordially as he pointed to a chair opposite him. As Steve accepted the invitation, his face reflected his delight and gratification at the success which had been won by his former apprentice.

"Gee! Dick," he exclaimed, "this is simply wonderful. Little did you think, when you struggled so hard to improve our methods and to put new enthusiasm into this shop, that recognition and reward would come so soon. You've earned every bit of it, Dick, and I'm delighted that the company recognized your merit."

"Thank you, Steve," replied Dick, "this came as a complete surprise and I'm having difficulty in getting adjusted to the change. However, I am about to issue my first order as superintendent of the department."

"Good, Dick. What's it going to be?"

"Effective tomorrow morning, Steve White is appointed assistant superintendent of this department!"

Steve sat stunned. For a moment he lost the power of speech entirely.

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Frank B. Carpenter

Wins April Prize

Description of a fixture for boring journal bearings in a lathe, which is used in the shops of the Charleston Interurban Railroad, Charleston, W. Va., was awarded the monthly prize of $25 for April in *Electric Railway Journal's* maintenance competition. Honorable mention was given by the judges to a split sleeve for protecting the ends of shafts while pressing into wheels, submitted by C. B. Hall of the Virginia Electric & Power Company, Norfolk, Va.

Frank B. Carpenter

who was awarded the monthly prize for April in ELECTRIC RAILWAY JOURNAL'S maintenance contest, is master mechanic of the Charleston Interurban Railroad, Charleston, W. Va. He has occupied this position since November, 1926. Mr. Carpenter's first electric railway experience was with the Birmingham Railway, Light & Power Company, as master mechanic. He served in the United States Artillery Corps in 1899 at the artillery district of Key West, Fla., being on special duty as assistant to the artillery engineer. Later he was appointed to the school of submarine defense, Fort Totten, N. Y., and studied electrical engineering pertaining to coast defenses.

Mr. Carpenter has had broad experience in connection with various electrical equipment, having served in the capacity of chief electrician and electrical engineer for a number of electrical companies. He designed and supervised many power plants and substations in the coal fields of Alabama, Kentucky, Ohio, West Virginia and Pennsylvania. In his present position, Mr. Carpenter has built many labor-saving devices for use in the Charleston shops in connection with maintenance of equipment, and has corrected many old methods by substituting improved ones. He is particularly interested in everything pertaining to modern methods, and ways to make an electric railway efficient.

BORING journal bearings for electric car trucks is a common operation and the fixture for doing this work in a lathe, as described by Frank B. Carpenter, master mechanic of the Charleston Interurban Railroad, Charleston, W. Va., in the April 21 issue of this paper, presents a simple and effective solution of the problem. This was awarded the $25 monthly prize. The railway bores journal bearings in a lathe and the fixture fits to the rotating head while the boring bar is held stationary in the tool post. Two bearings are bored at one time. Clamps for holding and centering the bearings fit to beveled projections of the fixture so that the bearings are centered accurately as they are drawn down in the tightening operation. The split sleeve protection for the end of axles while being pressed into wheels, described by C. B. Hall, chief clerk of the mechanical department, Virginia Electric & Power Company, Norfolk, Va., was awarded honorable mention.

Ten Weeks More for Maintenance Contest

As announced in the April 21 issue, the time of closing the maintenance contest was extended three months. The time limit for submitting items, previously set as April 30, was extended up to and including July 31.

Those who still have material that they wish to get in before the contest closes should send it in at once so articles can be arranged to better advantage. It is hoped that all maintenance men will take advantage of this opportunity to tell others of the good work they are doing. It is evident that articles published so far represent but a few of the advanced methods that can be found in most shops.

The following are revised conditions for submitting material in the contest:

1. Any employee of an electric railway or bus subsidiary may compete.

2. The author does not need to be the originator of the idea.

3. Articles may be submitted by several persons or by a department.

4. Any maintenance practice or device for electric railway or bus repairs may be submitted.

5. Articles should be 100 to 200 words long, with one illustration, and in no event longer than 400 words with two illustrations.

6. Illustration material may be in the form of drawings, sketches, blueprints or photographs. All sheets should be marked "Maintenance Competition."

7. Manuscripts should be mailed to the Editor of ELECTRIC RAILWAY JOURNAL, Tenth Avenue at 36th Street, New York, N. Y.

8. A prize of $25 will be awarded each month for the best maintenance idea in the group published during that month. A minimum of $5 will be paid for each article accepted for publication. Manuscripts will be received until July 31, 1928.

9. Announcement of the winner each month will be made in the issue devoted to maintenance and construction (the third issue each month) following the month in which the article was published.

10. Additional details were given in this paper, issue of April 16, 1927, pages 700-701.

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Electric Railway Journal Maintenance Data Sheet

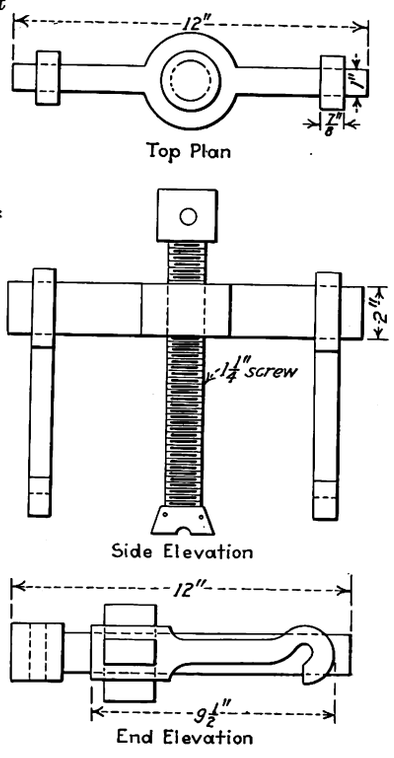
ROLLING STOCK—TRUCKS—24

Device for Straightening Brake and Door Rods*

BY BENJAMIN H. HALL
Shop Foreman West Penn Railways, McKeesport, Pa.

BRAKE rods sometimes bend when a car splits a switch, and door rods require straightening due to truck and automobile collisions. Usually these rods are less than 1 in. in diameter. The demand for a device to straighten this class of material led the West Penn Railways to construct a screw-straightening device in its McKeesport shop. Often the bent rods can be straightened in position without removing them from the car. Otherwise it is necessary to remove doors and miscellaneous equipment in order to have the rods straightened.

The straightening device consists of a crosshead in the center of which is a 1¼-in. screw. The top of this is arranged to take a round bar to act as a handle and the bottom has a block to fit over the rod to be straightened. The crosshead carries at each end two hooked pieces that extend down and hold the rod in position while the screw pressure is applied.



Convenient device for straightening rods without removing them from cars

Submitted in ELECTRIC RAILWAY JOURNAL Prize Contest

Electric Railway Journal Maintenance Data Sheet

TRUCK AND WAY DEPARTMENT—26

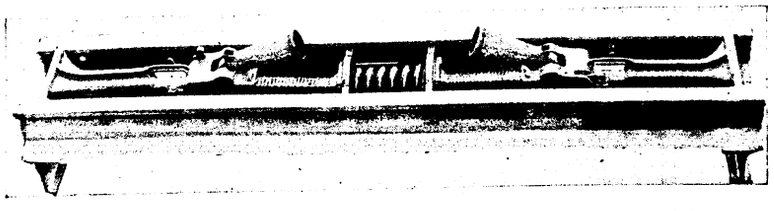
Testing Frame for Track Jacks*

BY W. J. MCCALLUM
Foreman Frog Shop Way Department Toronto Transportation Commission, Toronto, Canada

WHEN lining special trackwork use is frequently made of track jacks in a horizontal position. Jacks that otherwise operate perfectly sometimes do not work so well when used horizontally. In order to check and adjust jacks for this defect, as well as for ordinary repairs, a frame, shown in the accompanying illustration, was designed by the way department frog shop of the Toronto Transportation Commission, Toronto, Canada.

The frame consists of two pieces of 7-in. T-rail welded to short cross arms. Between the side members is a sliding head made up of a seven-ton spring with one-inch plates on either side held together with ¾-in. bolts. The plates have a boss on one side to hold the spring, and a corresponding socket on the other which retains the head of the jack.

In testing, two jacks are placed in the frame. The ram of one is run in to the limit and the other is fully out. By working one jack against the other, the spring is compressed and each can be tested to the full length of stroke.



Framework used for testing jacks in a horizontal position

Submitted in ELECTRIC RAILWAY JOURNAL Prize Contest

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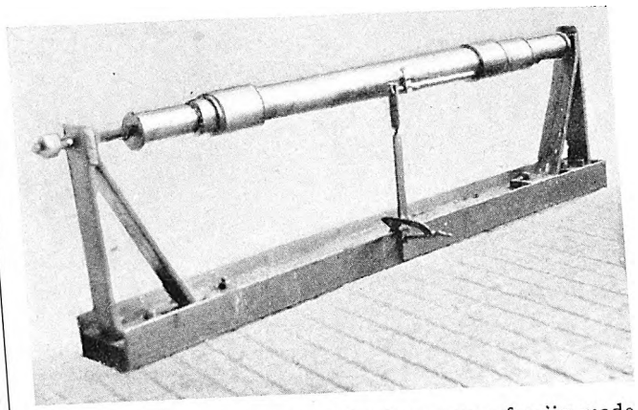
Electric Railway Journal Maintenance Data Sheet

ROLLING STOCK—TRUCKS—25

Jig for Testing Bent Axles*

BY C. B. HALL

Chief Clerk Mechanical Department
Virginia Electric & Power Company, Norfolk, Va.



Testing an axle for eccentricity by means of a jig made in the Norfolk shop of the Virginia Electric & Power Company

FOR testing bent axles and the alignment of wheels a jig shown in the accompanying illustrations has been constructed in the machine shop of the Virginia Electric & Power Company, Norfolk, Va. An I-Beam forms the base, with an upright at either end made of 1x3-in. bar. Centers for the axle to be tested are fitted at the top of the uprights, one of which is arranged to slide to provide for different lengths of axles. There is a screw centering adjustment at one end. A movable truing pin is clamped to the center of the base. Adjustment of the pin as desired is made with a thumbscrew.

The accompanying illustration shows an axle in position for testing. Wheel alignment after wheels are pressed on axles is also tested by sliding and adjusting the truing gin to the wheel.

Submitted in ELECTRIC RAILWAY JOURNAL Prize Contest

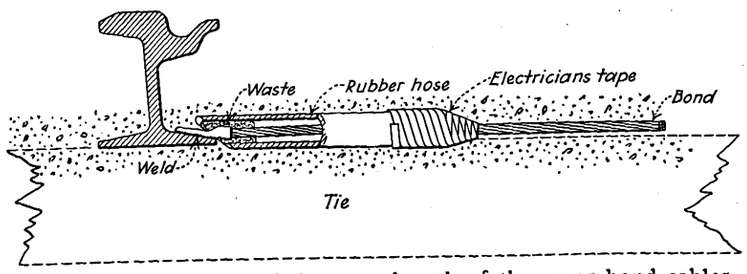
Electric Railway Journal Maintenance Data Sheet

TRACK AND WAY DEPARTMENT—27

Protection for Cross Bonding in Concrete*

BY R. J. FENNELL

Assistant Roadmaster Way Department Toronto Transportation Commission,
Toronto, Canada



Rubber hose is installed over a length of the cross bond cables to provide for movement

BREAKING of concrete-imbedded cross bonds at the point where the cable enters the terminal, is prevented by the welding and bonding section of the Toronto Transportation Commission, Toronto, Canada, by means of the scheme shown in the accompanying illustration.

Before the terminal is welded to the rail, a 12-in. length of scrap hose is slipped over the end of each bond. The opening at the terminal end is stuffed with waste and that at the cable end is closed by winding with electrician's tape. With this method of installation, if the rail becomes loose in the concrete bed, any movement is taken up in the free length of cable within the hose and the bond will not break at the junction of the steel terminal.

Submitted in ELECTRIC RAILWAY JOURNAL Prize Contest

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Electric Railway Journal Maintenance Data Sheet

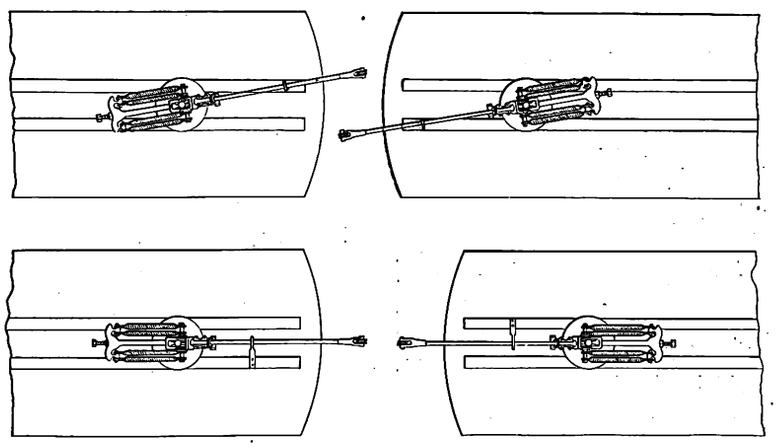
ROLLING STOCK—MISCELLANEOUS—32

Staggered Trolley Hooks Permit Placing Cars Close Together*

By Farrell Tipton
Electrician San Diego Electric Railway, San Diego, Cal.

MOST carhouses are handicapped for space in storing cars, so it is desirable to crowd them as closely together as possible. With some types of cars the trolley poles extend beyond the ends, and with the trolley hooks in the center, cars are kept a considerable distance apart in order to give clearance. This also is dangerous to workmen as the cars may be placed so close together that the trolley connections on one car will be energized by the car ahead.

To overcome these objections the San Diego Electric Railway, San Diego, Cal., staggers the trolley hooks, so that the poles will pass each other with the cars placed close together. This was accomplished with little cost by turning the hooks around from their former position and using the same installation holes.



Staggered trolley hooks permit storage of cars close together

*Submitted in Electric Railway Journal Prize Contest.

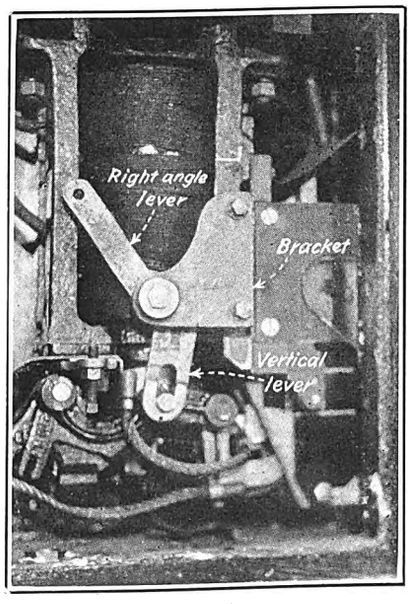
Electric Railway Journal Maintenance Data Sheet

POWER AND ELECTRICAL DEPARTMENT—1

Sectionalizing Switch Closed by Hand Lever

WITH the power layout of the Key System Transit Company it is oftentimes necessary to hold a sectionalizing switch closed for a moment or for a longer time, particularly on an isolated section of line where a short circuit has opened the sectionalizing switches at both ends. This happens when the substation feeding the section is shut down for inspection or other reasons. It is then necessary to close one of the sectionalizing switches after the short has been cleared before the other sectionalizing switch will pick up.

To effect the closure, a bracket is mounted on the main frame of the sectionalized switch solenoid. A right-angle lever at one corner



Device mounted on sectionalizing switch by which it is possible mechanically to close the contactor

throws over center a vertical lever which pulls the contactor of the switch up into the closed position. At the extreme upper end of the right-angle lever is a rod with an insulated joint which projects through a hole in the bottom of the switch box. The rod is not shown in the illustration. A lineman may pull down on this rod to close the switch. When the line is energized the switch will hold itself closed. The rod is then raised and the vertical lever thrown back off center into its original position. By means of a slot located in the lower end of the lever the rod can return to its original position without disengaging the switch contactor.

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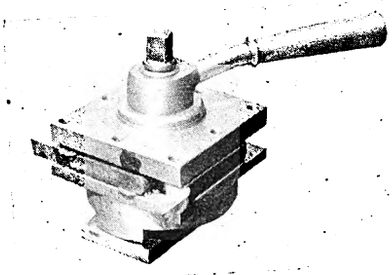
Electric Railway Journal Maintenance Data Sheet

ROLLING STOCK—MISCELLANEOUS—33

Four-Way Tool Post

FOUR tools can be held in a tool post and rotated so as to bring each into working position in a handy device originated by workmen in the 39th Street repair shop of the Brooklyn-Manhattan Transit Corporation, Brooklyn, N. Y. The base for this tool holder consists of two parts, a bottom bar which fits into the compound rest slide of the lathe carriage and an upper circular section. A screw which passes through these, clamps the tool holder to the lathe carriage in the same manner as with an ordinary tool post to hold it firmly in position.

The top of the four-way tool post holder is 4½ in. square and the four tools are held in position by headless setscrews. The accompanying illustration shows cutting-off tools in position, but boring tools or outside turning tools can be used equally well. When the holder is rotated so as to bring a tool into position it is held firmly by a pawl in the lower portion. This pawl is forced into a hole in the top section by a spring. A lever in the lower section when pressed down disengages the pawl. By a quick turn of the clamping stud the holder is released and can be rotated so as to bring the desired tool into position. Another turn of the lever on the holder, clamps it securely so that there is no danger of loosening. The entire outfit is self-contained and there are no detached parts to lose.



Four-way tool-post holder for use on lathe

Electric Railway Journal Maintenance Data Sheet

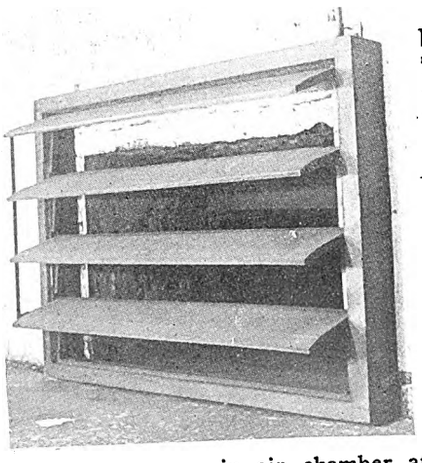
POWER AND ELECTRICAL DEPARTMENT—2

Automatic Shutters on Blowers for Air-Cooled Transformers*

BY M. D. SCHWEGLER

Superintendent of Power Toronto Transportation Commission, Toronto, Canada

ON AIR chambers where more than one blower operates in an air chamber of a substation considerable trouble was experienced by the Toronto Transportation Commission from broken shafts and couplings. The breakages were caused by operators closing the motor starting switch on the motor of a blower which was rotating backward due to the neglect of the substation attendant to close the cut-off shutter.



Fan shutter open in air chamber at Front Street substation of Toronto Transportation Commission

This trouble has been eliminated by installing a self-operated shutter. The vanes are counterweighted so that they are slightly off balance. The air from a running blower holds the shutter open, while the back pressure of the air chamber closes it and holds it closed when the blower is shut down. These shutters were installed about two years ago and since then no trouble has been experienced with any of the blowers.

*Submitted in ELECTRIC RAILWAY JOURNAL Prize Contest.

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Electric Railway Journal Maintenance Data Sheet

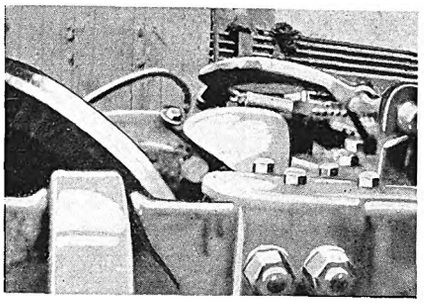
ROLLING STOCK—ELECTRICAL—46

Motor Intake Cover to Keep Out Snow*

By R. T. Chiles

Master Mechanic Cumberland County Power & Light Company, Portland, Me.

During the winter months, from the middle of December to the middle of April, the Cumberland County Power & Light Company, Portland, Me., is compelled to close up the ventilating intakes of its motors to prevent an accumulation of snow in them. The tying of canvas over the ventilating intakes was tried at first, but was found unsatisfactory. It also was expensive in material and labor. A light galvanized iron cover is now used, which fits over the ventilating intake. This costs 30 cents per cover and can be put on and removed easily. Its substantial construction also will enable it to last several winters. The type of cover used is applicable to both the GE-201G and the GE-203A motors.



Galvanized-iron cover fits over ventilating intakes of motor

*Submitted in Electric Railway Journal Prize Contest.

Electric Railway Journal Maintenance Data Sheet

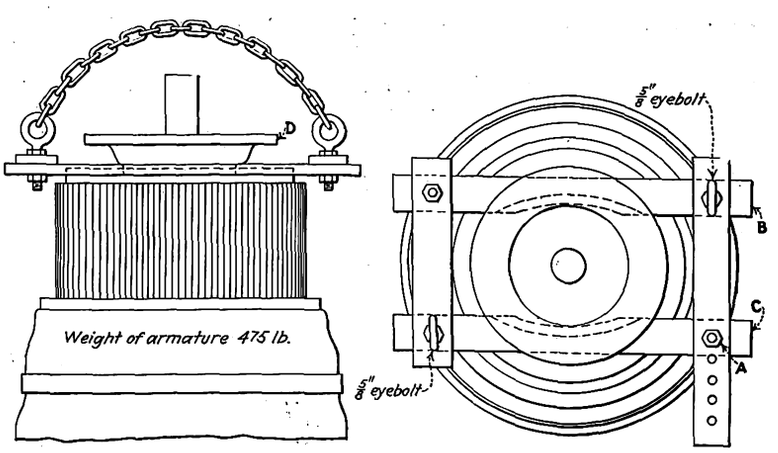
ROLLING STOCK—ELECTRICAL—48

Attachment for Lifting Armatures Quickly*

By Arthur E. Clegg

Foreman Electrical Department San Diego Electric Railway, San Diego, Cal.

Where armatures are dipped and baked a common method is to dip them with the commutator end up. For this a device for attaching the lifting hook, which can be fastened quickly and conveniently to the armature, is desirable. Such a device, used by the electrical department of the San Diego Electric Railway, is shown in the accompanying illustration. To attach it to the end of an armature, the bolt marked *A* is removed. This allows side pieces *B* and *C* to swing apart, giving clearance to place the device over the armature wiper ring *D*. The side pieces are cut out and beveled. By having several holes in the end cross-pieces, the sides can be adjusted so that they will fit snugly under the wiper ring. In the illustration, one of the end cross-pieces is longer than the other, allowing for a row of bolts for adjustment. The two eyebolts which fasten the equipment together form a convenient means for attaching the lifting chain.



Device for lifting armatures commutator end up

*Submitted in Electric Railway Journal Prize Contest.

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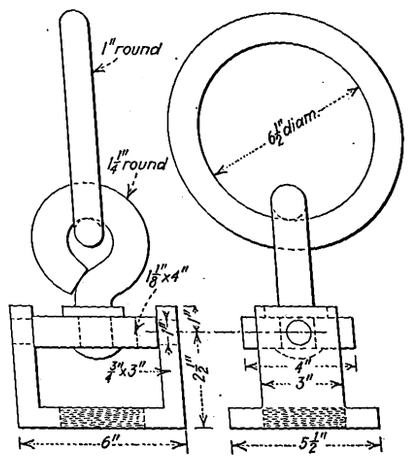
Electric Railway Journal Maintenance Data Sheet

ROLLING STOCK—ELECTRICAL—47

Lifting Armatures by Pinion Nut Threads

TWO methods of lifting armatures are used in the shop of the New York, Westchester & Boston Railroad, Westchester, N. Y. In one of these the armature is horizontal and in the other it is vertical. The type of motor now in service is such that it was found cheaper and quicker to remove and install the armatures in a vertical position. The lifting nut shown in the sketch was developed for this purpose. This is made of a "U" bracket, rotating cross bar, swivel eyebolt and a ring. The "U" bracket is made from ¾x5½-in. stock. The bottom is drilled and tapped to fit the armature shaft pinion nut threads and the ends and sides are forged down to a width of 3 in. A ⅛x4-in. bar installed inside of this bracket swivels on axles of 1-in. diameter. An eyebolt made from 1¼-in. round stock is riveted loosely to the center of the bar so that it is free to rotate. The lifting is done by a 6½-in. diameter ring made from 1-in. round material fastened to the eyebolt.

The horizontal lifting is done by means of a flat leather sling. Both of these lifting methods have proved entirely satisfactory.



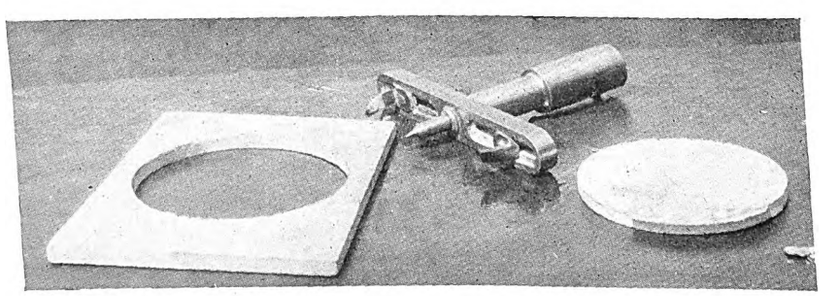
Device used for lifting armatures by the end of shaft

Electric Railway Journal Maintenance Data Sheet

ROLLING STOCK—ELECTRICAL—49

Cutter for Dust Guard Holes

MOST electric railways make their own dust guards for journal bearings out of wood. The accompanying illustration shows a special cutting tool which has been developed in the 39th Street repair shop of the Brooklyn-Manhattan Transit Corporation, Brooklyn, N. Y., for doing this work. The shank of the tool is arranged to fit in a drill press so that different sized holes can be cut. The lower end of the shank carries a center point. This is held down against the piece of wood by a small spring inside the shank. As the cutting tools are fed into the work the center lifts to the extent that the tools sink into the work.



Convenient tool for cutting holes in dust guards

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American Association News

Way and Structures Men Hold Spring Meeting in Atlanta

MEMBERS of the A.E.R.E.A. Way and Structures Division and guests numbering 52 gathered in Atlanta, Georgia, on Monday, May 7, for a series of meetings during that week. This was the largest meeting of the division ever held and among the guests were a number of way engineers from southern properties. The Georgia Power Company acted as host and arranged an interesting program of inspection and sight-seeing trips, including an inspection of the railway property in Atlanta. The committee on this trip had an opportunity to inspect the so-called beam type of track which for a number of years has been employed successfully in Atlanta with both steel and wood ties, and to observe the condition of this track and various types of paving which have been in service for a long period of time. The storage yard, creosoting plant and track machinery of the company were also of special interest. The delegates were guests of Frank L. Butler on Tuesday evening, at a dinner held at the East Lake Country Club. On Wednesday, the entire group was taken by automobile to the camp of the Georgia Power Company at Gainesville, where several of the committee meetings were held. Among the points of interest shown the delegates was Stone Mountain, just outside of Atlanta.

All of the meetings were unusually well attended and the discussion of the various subjects was participated in by the invited guests as well as by the committee members. At the close of the meetings a resolution was passed by the Way and Structures Division expressing the appreciation of the group for the many courtesies extended them by the Georgia Power Company. Also a resolution was passed thanking Frank L. Butler, C. A. Smith and H. L. Wills, who were in charge of the arrangements and who did everything possible to make the meetings and the trips successful and enjoyable.

Following are brief reports of the several meetings of committees in this division held during the week.

No. 2—Special Trackwork

SPECIAL way and structures committee No. 2 met in the directors' room of the Georgia Power Company on Monday, May 7, with more than 40 members and guests present. Some of the more important matters discussed and acted upon by the committee were as follows:

The shape of the opening in the switch body casting and the location and shape of the pocket for the several switches under consideration by the committee were agreed upon. The throw at the center line of the lug was increased to 1§ in. for all of the proposed standard switches and the location of the lug was changed accordingly on each switch. Agreement was reached to brand all switch tongues on the top at the heel with radius, hand and symbol of maker. In addition, the maker may, at his option, show the tongue pattern in depressed numbers on the underside of the tongue.

There was but a brief progress report on the subject of expansion joints. Action was taken on a report submitted by Mr. Bragg on rules for the maintenance of electric or spring switches. A design of double spring frog prepared by Mr. Peabody was discussed and certain modifications suggested. In accordance with the action taken at a meeting held on Dec. 30, 1927, Mr. Alden presented a revised design for split switches, which was approved.

The specification for iron bound, hard center special trackwork was considered in detail. Each of the railway representatives present spoke of his experiences with this type of construction and expressed his opinion regarding the necessity for modifications of the specification. Each manufacturer representative present expressed his opinion regarding the necessity for modifying the present specification. After some further discussion the meeting was adjourned and reconvened on Wednesday evening at the Georgia Power Company Camp. As a result of thorough discussion the following modifications were proposed and agreed upon by the committee:

Paragraph 412—A sentence is to be added to this paragraph reading, "When necessary between switches, mates, frogs and crossing intersections, a four-bolt joint on 7-in. special trackwork and an eight-bolt joint on 9-in. special trackwork may be used unless otherwise specified."

Paragraph 407 (a)—Omit the last sentence reading, "The minimum depth of the body portion shall be 8 in." and substitute for it the following, "The minimum depth of iron under 7-in. special trackwork to be 1 in. thick."

No. 12—Rail Corrugation

COMMITTEE No. 12 met also in the directors' room of the Georgia Power Company on Tuesday afternoon, following an inspection trip of the railway property in which particular attention was given to those sections of track on which corrugation has occurred. There were 32 members and guests present at this meeting. Secretary Ewing announced that data collected for six locations in Detroit had recently been received. He asked for suggestions regarding the analysis of the data now on hand from various properties. After discussion he was requested to submit, prior to the next meeting, analyses which in his opinion would be of the greatest value. Among the more important matters discussed by this committee may be mentioned the following:

Contributing causes of corrugation and allied subjects and causes; do corrugations occur alternately or opposite when both rails are affected?; car nosing, including stresses set up in rails; analysis of rail stresses, including those set up by changes in temperature; tractive effort stresses; vertical and torsional vibrations of wheels; vertical vibration of rails; rail fatigue; area of wheel contact; rail deflection tests.

There was also a discussion of the corrugation observations taken on the inspection trip during the morning. A statement prepared by H. S. Williams of Detroit on "Stresses in Steel Rails Caused by Temperature Variation" was read and discussed. This statement was based on data obtained from the Department of Street Railways, Detroit.

The complexity and highly technical nature of the work assigned to this committee is evident from the list of subjects outlined above. It has been necessary for the committee in analyzing many of these problems to either devise new instruments or adapt existing scientific measuring devices to the particular tests at hand. The committee probably will not be in a position to make a final report for some time but at the conclusion of the meeting it was agreed that a progress report would be presented at the convention this year covering: (1) A brief statement of the previous consideration; (2) a record of meetings for the year and work done on each of the subdivisions of the assignment; (3) conclusions where any have been reached; (4) recommendations.

No. 5—Wood Preservation

WAY and structures committee No. 5 held a brief meeting at the Georgia Power Company Camp on Thursday. Due to the fact that the work of this committee had not progressed very far the attendance was small and the meeting was quite informal. A tentative report was presented by Mr. Swayze on preservatives other than creosote. Several suggestions were made for elaborating certain phases of the report and Mr. Swayze agreed to carry out these suggestions and present another report prior to the next meeting.

Mr. Smith announced that Mr. White had presented a report on wood preservatives having resistance to fire. He announced that the other three subjects—Review of Manual, Treatment of Poles and Timber in Place and Economy in use of Treated Timber were not yet ready for presentation.

In a general discussion two matters were brought up for consideration; (1) How can the committee best stimulate interest in the use of wood preservatives? (2) To what extent is it desirable to duplicate in the Manual existing specifications of the American Wood Preservers' Association or the American Society for Testing Materials? Both of these questions will be discussed at the next meeting of the committee which will be held just prior to the next meeting of the standing committee on way and structures.

Standing Committee on Way and Structures

FOLLOWING these sessions of special committees, a meeting of the Standing committee on way and structures was held at the Georgia Power Company Camp on Friday, May 11, with 34 members and guests present. Eleven of the thirteen

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members of the standing committee were represented and in addition five of the seven special committee chairmen, who are not members of the standing committee, were represented.

T. H. Newbold, representing W. R. Dunham, Jr., presented the progress report of special committee No. 1 containing a number of recommendations to advance existing recommended specifications or designs to standards. The committee recommended also that Manual section W101-15 be referred to a proper committee for study and that if no revisions are required it be advanced to standard. A recommendation was also made to combine Manual section W111-25 with W13-24, making the combined section a standard. It was voted to put a footnote on Manual section W113-23 calling attention to the revised serial designations of Manual sections referred to by number in this specification. It was voted also to withdraw section W200-23 from the Manual and substitute a single page reference calling attention to the withdrawal and stating that the text may be found in the Engineering Proceedings. All of the above matters will be submitted for letter ballot to the entire standing committee.

Mr. Ryder reported briefly on the work of way and structures special committee No. 2 and stated that a written report would be prepared and submitted for consideration at a later date.

Mr. Baker stated that his committee had sent out a questionnaire to a selected list of 41 member companies, 32 of which had replied to date. He reported that this committee met on March 7 in Chicago. Mr. Baker expects to obtain replies from the nine companies that have not yet answered the questionnaire after which his committee will analyze the data and prepare a report.

Mr. Smith reported on the meeting held by his committee, No. 5, on May 10. There was some discussion of the desirability of adopting certain wood preservation specifications by reference only where they were identical with those of the American Wood Preservers' Association or the American Society for Testing Materials. The difficulty and expense of the frequent revisions of these specifications was stressed and the committee instructed to give serious consideration to this matter in its report. In connection with the matter of stimulating interest in the use of wood preservatives the general opinion seemed to be that more attention would be devoted to the economies to be obtained with wood preservatives.

Mr. Merker, representing Chairman Gailor of way and structures committee No. 6, reported that his committee had been expanded to include additional manufacturers and railway engineers and that the hearty co-operation of the American Welding Society was now being obtained through the committee appointed by President Farmer of that organization. Attention was called to the decision of the committee to change the title of the welding rod specification from "Specification for Welding Rods" to "Specification for Bare Electrodes." A specification is also being prepared covering the so-called flame test which has recently been developed and is believed to be a simple yet very practicable test for determining the welding properties of the electrodes. Mr. Merker further stated that, owing to the delay in expanding the committee and in arranging for the co-operation of the American Welding Society, it would not be possible to present more than a progress report this year.

Mr. Spencer reported in considerable detail on the work to date in investigating alloy steels other than manganese for special trackwork. He announced the results of some welding tests on both chrome nickel and manganese steel which had been made by the Canadian Steel Foundries on specimens welded by the Montreal Tramways. He also announced the results of the tests made by the Lorain Steel Company on test specimens which they themselves made up. In view of the fact that there are a number of variables entering into such tests it is not surprising that there were some inconsistencies in the results of the two sets of tests. Mr. Spencer hopes to arrange with each of the manufacturers to submit test pieces, all of which will be welded in the presence of the committee with the same types of electrodes and by the same welder. It is his plan then to have the welded specimens tested in the laboratory in the presence of the committee members. He stated that one more meeting of the committee would be held this year, but that it was not likely that a final report would be presented at the convention.

Mr. Harvey presented a copy of a tentative report of his committee which was read and discussed. Comment was made on the use of T-rails in the cross-sections of track construction used as illustrations and it was pointed out that the committee had simply followed out the procedure adopted by previous committees on this subject. It was suggested that except in the case of pavement contours suitable only for T-rail sections the association's 7-in. grooved girder rail be shown in the illustrations.

Owing to the importance of this subject and the fact that the report had not been studied by the members of the standing committee, the chairman asked each member to review the report promptly on his return home and forward to Mr. Harvey a written discussion, sending copies of the discussion to all members of the standing committee. With this information Mr. Harvey's committee will then be in a position to prepare a final draft of the report for consideration.

Mr. Hughes, chairman of the committee on bus garages, was not present and no report was submitted. Mr. Hecker submitted a copy of the advance report of the National Fire Protection Association garage committee and called attention to the modifications which had been made in the original draft through the efforts of the A.E.R.E.A. representatives. He stated that copies of this report had been submitted to way and structures committee No. 9 for comment and criticism and that during the coming year the report would again be reviewed by the National Fire Protection Association garage committee with the view of making any necessary revisions and submitting it in 1929 for final adoption. He reported also that at a recent meeting the committee had analyzed its several subject assignments and agreed upon a program of carrying out the work for the year.

Mr. Hawkins, reporting as chairman of the committee on track construction, stated that it did not desire to make any recommendations this year. Due to the interlocking membership on the corresponding committee of the American Society for Municipal Improvements, and the harmonious relationship existing between the two committees Mr. Hawkins did not believe anything should be done by the way and structures division which would in any way disturb the present satisfactory situation.

Mr. Wysor reviewed briefly the work of the committee on rail corrugation, calling attention to the meeting held earlier in the week and outlining the status of the various matters under consideration. He stated that his committee would present only a progress report covering the work accomplished during the year.

Chairman Eckroad of way and structures committee No. 13, joint railway and bus terminals, was not present nor was any report presented for the committee. Mr. George stated that he had seen no correspondence of this committee since its organization but attributed this to the fact that the committee was organized rather late in the year. Chairman Eckroad is urged to make a special effort to have at least a progress report for the convention.

COMING MEETINGS OF Electric Railway and Allied Associations

May 22-24—**Indiana Public Utilities Association, Columbia Club, Indianapolis, Ind.**

May 24—**New England Street Railway Club, annual meeting, Boston, Mass.**

May 28-31—**National Association Purchasing Agents, annual convention and exhibit, American Royal Building, Kansas City, Mo.**

June 4-6—**Midwest Electric Railway Association, Hotel Baltimore, Kansas City, Mo.**

June 4-8—**National Electric Light Association, Atlantic City, N. J.**

June 6-8—**Canadian Electric Railway Association, annual convention and exhibit, Toronto, Canada.**

June 12-13—**American Wood Preservers' Association, Chattanooga, Tenn.**

June 14-15—**New York Electric Railway Association, Half Moon Hotel, Coney Island, N. Y.**

June 20-27—**American Railway Association, Div. 5—Mechanical, annual convention and exhibit, Atlantic City, N. J.**

June 21-22—**American Railway Association, Motor Transport Division, Atlantic City, N. J.**

June 21-22—**Wisconsin Utilities Association, Accounting Section, Hotel Pfister, Milwaukee, Wis.**

June 28-29—**Central Electric Railway Association, Cedar Point, Ohio.**

July 8-12—**Public Utilities Advertising Association and International Advertising Exposition, Detroit, Mich.**

July 13—**A.E.R.A. Executive Committee, New York, N. Y.**

July 18-20—**American Society of Civil Engineers, annual convention, Buffalo, N. Y.**

July 25-27—**Electric Railway Association of Equipment Men, Southern Properties, Cincinnati, Ohio.**

July 27-28—**Central Electric Railway Accountants' Association, Detroit, Mich.**

Aug. 16-17—**Wisconsin Utilities Association, Transportation Section, Sheboygan, Wis.**

SEPT. 22-28, 1928

American Electric Railway Association, 47th annual convention and exhibit, Cleveland, Ohio.

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Mr. George reported that way and structures committee No. 14, rails, had submitted a final report on branding which had been sent to the standing committee for letter ballot, ten votes having been cast. This report was prepared after joint consideration by way and structures committee No. 14 and representatives of the track committee of the A.R.E.A. Mr. George announced that in two of the votes cast, one disapproved the recommendation and the other made certain suggestions for an alternate rail designation. Following a discussion both of those members withdrew their original votes and approved the report as submitted. The remaining two members were asked to submit their votes as promptly as possible. It was requested by Chairman Alden of this committee that the submission of the report to the general secretary be withheld until action had been taken by the A.R.E.A. track committee on May 30.

Mr. Clark submitted for special committee No. 15, drawings of a full size for a track checking gage and wheel checking gage. This gage is so designed as to permit readings on a scale of the actual gage of either track or wheels.

Mr. Ryder questioned the effect of the curved-head rails on the location of the gaging points on the rail and of the need for considering this in the design of a measuring device. He also called attention to the fact that the committee had apparently not considered the second half of its assignment, viz., "Check gaging point on rails and wheels to determine if present practice is correct." After some discussion it was voted that the drawing be referred back to special committee No. 15 and that it be requested to complete its assignment. In the discussion of the gage submitted Mr. Flowers and Mr. Ewing both stressed the importance of wheel coning on the centering of the wheels on the rails.

Chairman L. A. Mitchell of special committee No. 16 was not present at the meeting and no report was submitted. This committee was organized late in the year, which probably accounts for the delay in getting the work started. Chairman Mitchell is urged to make a special effort to at least present a progress report at the convention.

Chairman George then called attention to a suggestion of Mr. Smith that a study be made of the desirability of modifying the heads of the Association's standard girder guard rails to conform to the curved heads of the standard grooved girder rails. Mr. Smith moved that the matter be referred to special committee No. 14 for consideration and report. The motion was duly seconded and approved.

Those in attendance at the several committee meetings were: C. A. Alden, F. L. Butler, S. Clay Baker, B. R. Brown, David Berman, E. B. Bloom, J. A. Campbell, B. R. Chestney, Charles H. Clark, T. H. David, E. B. Entwisle, L. O. Eiffert, D. D. Ewing, H. Fort Flowers, H. H. George, C. L. Hawkins, W. H. Hayes, H. F. Heyl, A. E. Harvey, J. H. Haylow, G. C. Hecker, C. R. Kinnear, W. M. Kingston, T. J. Lavan, J. R. McKay, A. D. WcWhorter, W. H. McAloney, R. F. Marion, J. T. Moore, H. F. Merker, C. L. Moses, T. N. Newbold, A. M. Nardini, E. S. Olmsted, R. M. O'Brien, M. L. Rahner, A. T. Spencer, J. H. Sundmaker, H. F. Swayze, C. A. Smith, E. M. T. Ryder, E. R. Rath, C. R. Seybold, R. E. Tafel, A. Taurman, H. J. Tippet, J. B. Tinnon, H. S. Williams, W. W. Wysor, A. S. Wentworth, A. J. Yauger, W. S. Yeates.

News of Other Associations

Central Master Mechanics Hold Two-Day Session

EIGHTY maintenance men attended the Erie meeting of the Central Electric Railway Master Mechanics' Association on May 9 and 10. This approximated the record established at the Pittsburgh meeting a year ago, which at that time was credited with being the largest in the history of the association. The two days spent in Erie were crowded to the limit with a business session and inspection trips. During the business session which occupied the morning of the first day and a part of the afternoon the reports of a number of standing committees were presented, discussed in considerable detail and adopted with some modifications.

Further progress was made in determining equipment standards for freight cars in interchange service and for the completion of a revised list of uniform charges and standards. Standardization details relating to grab bars were discussed and the recommendations of the committee accepted. Chairman A. J. Challeen of the committee on revision of uniform charges presented a report outlining a new basis for standardizing prices of truck and car parts. The system of credits is eliminated and an allowance for the salvage value of scrapped parts made in fixing the new prices for replacements. Before the adoption of this report, however, considerable discussion was aroused. In the rules governing the condition and repair of freight cars for interchange service as adopted by the association May 11, 1927, and published in ELECTRIC RAILWAY JOURNAL for May 28, 1927, and Jan. 7, 1928, the objection was raised to the "plus 15 per cent" which rule 38 authorized to be made over and above the cost for material and labor in making repairs to foreign cars.

The committee appointed to write a set of instructions covering the proper use of cards and forms used in the interchange of equipment in cases involving damage to cars recommended the use of four forms only; a defect card, bad order card, repair card, and a uniform foreign defect and repair report. The committee stated that while it is true that several additional cards have been adopted by the association, it was the consensus of opinion that there should be published at present only the four forms mentioned, and that the members of the association should see that their foremen, inspectors and repair men become thoroughly familiar with the use of the cards. Detailed instructions for their use were incorporated in the report and the whole accepted.

The meeting voted to incorporate all existing standards, uniform charges and forms used in the conduct of interchange business in a handbook to be published by the association as soon as possible.

Following the completion of committee reports the session was thrown open for a consideration of questions relating to mechanical practices which had been previously prepared and sent to the members. Lively differences of opinion developed.

In addition to entertaining the master mechanics at luncheons on Wednesday and Thursday the General Electric Company was the host at a banquet given them Wednesday evening at the Lawrence Hotel, Erie. The dinner was made the occasion for informal remarks from F. E. Case, railway engineer of the General Electric Company, who was called on by F. J. Foote, president of the association.

Thursday was given over to an inspection tour of the Erie works of the General Electric Company, and for those who especially wished it a trip was arranged between Erie and Northeast, Pa., on a magnetic-brake equipped car belonging to the Buffalo & Erie Railway. Results of the initial tests were published in this paper for July 17, 1926 and Aug. 21, 1926. At the Thursday luncheon the place of the fall meeting was selected as Cleveland, Ohio.

Central Electric Railway Master Mechanics at Erie Works of the General Electric Company, Erie, Pa., May 10, 1928

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Using Power and Light Ideas in Selling Rides*

By Walter Jackson
Fares and Motor Bus Consultant, Mount Vernon, N. Y.

GAS and electric utilities are not faced by the competition of home-manufactured products, and have the further advantage of knowing precisely how much the customers buy. Contrast this with the plight of the purveyor of public transportation, who is faced by a serious competitor, the private automobile, and who has no first-hand knowledge as to the riding habits—in time, frequency, distance—of the individual patron. No matter how many costly surveys he may make of passenger movement, the answer is a mass and not an individual one. He learns that a certain number of persons ride a given line on a given day, leave at a certain corner and disperse in a certain neighborhood. For this reason, it is much more difficult for the electric railway and bus operator to set up a proper schedule of rates such as will combine greatest revenue to the company with greatest usefulness to the public.

The gas and electric utility man has been so successful in selling at differential rates to build up an all-day load factor that he has actually reversed the original situation. Formerly, a daily load curve had the same peak aspect that the electric railway load curve has to this very day. Now, the heaviest load comes in the morning hours when industry is busiest. The gas and electric utility man has been guided by two principles in developing his variety of rates and rate structures; that of granting a lower rate in accordance with quantity purchased, and that of granting a lower rate to those who purchase when the maker has an unavoidable surplus. Furthermore, the two principles are modified by the competition factor.

Purveyors of local transport, as a class, have done very little with lower rates for wholesale use, the first principle. A cash fare for all, regardless of the distance traveled, is in use as well as a ticket rate—sometimes two such rates—which grants a lower fare to persons who invest in more than one fare at a time. However, those who pay more than one fare are not necessarily wholesale users of the service and the wholesale rate is granted without proof of consistent patronage. As to the second principle—lower rates to those who buy when the maker has a surplus—local transportation companies have made practically no move. The rate for a long ride in a crowded car is as much as that for a short off-peak ride in a car with many empty seats.

The competition factor which modifies the rate adjustments for gas and electric utilities should be considered more seriously by electric railway men than it is. Walking is a serious competitor, as are the telephone and the radio, but the overwhelming competitor is the privately operated automobile. Although the average automobile owner has little interest in detail cost, it does not follow that he will pay no attention to public transport rates that are lower and more convenient. In many cities, the use of a personal machine for travel to and from the business district has lost its savour, and transport concerns are having less difficulty in holding or gaining rush-hour business in proportion to the growth of industry.

Although wages, materials, taxes, etc., are higher now than they were a decade ago, the transport in competition with the bus and the trolley has been growing cheaper. Continuance of old rate-making practices, therefore, means that we are trying to get more money from a diminishing clientele. Transport men should not be fatalistic about the decline of off-peak traffic when it is borne in mind that there are more persons outside the store and factory and office than there are in them. In other words, the traffic to and from the job does not have to be the major traffic. It is not reasonable to complain about the loss of off-peak traffic, or failure to gain such traffic, if no use is being made of differential rates.

Fares That Classify the Patrons

City transport systems have no way of determining the amount of riding, the hourly distribution and the length of riding done by individual customers. However, there are available certain classes of rates that at least reveal the habits of riders by groups. These rates are made possible by the use of special cards, as the permit card, weekly pass, Sunday-holiday pass, and the week-end pass.

Closest to the practice of gas and electric utilities is the use of a permit card. The purchaser pays a fee of 25 cents or more a week for a card which permits him to travel for 5 cents additional per ride. The principle has proved a success on properties securing increases to 10 cents from cash fares as low as 6 cents and 7 cents, and to token rates like 8.33 cents. It has been less successful, or even a reducer of revenue, where the increase in other fares was little or nothing. Unquestionably, the permit card in its more liberal weekly, transferable form, is a better way of producing more revenue than a straight increase in fares; but as it does not do much to encourage off-peak travel, it falls short in respect to the main problem.

More widely used is the type of rate called the unlimited ride, weekly pass. The flat rate for riding has proved practicable; first, because unlimited riding in theory is closely limited in practice, and, second, because almost all extra riding with a pass comes in the non-rush hours. The most likely buyer of a pass is a person who is already a peak-hour customer. Hence, it makes no difference whether he or someone else uses his pass rides also at other times. The weekly pass is deliberately priced to bring out whatever off-peak riding is possible among its buyers. It generally costs four to six more fares than the twelve compulsory rides each week between home and job, so that the purchaser is either a person with some off-peak riding or one who feels that this type of rate will encourage him to become an off-peak rider. The pass has been most successful on medium and large properties with a large market.

Off-Peak Passes Also Encourage Riding

While the weekly pass, through its cheapness for the off-peak extra rides and its avoidance of change-making, transfers and identification checks, is a popular institution, it still falls short of building up the off-peak loads and revenues sufficiently. For this reason it is advisable to use an off-peak pass which could be sold for one-half or two-thirds of the standard pass cost to persons who ride less frequently than the worker who must ride twelve times a week. It has been estimated that the standard weekly pass produces good off-peak riding from one-third of the customers. It is possible that an off-peak pass would produce similar results with another third of the patrons.

Pittsburgh, Cincinnati, San Francisco and St. Louis, in the order named, are the metropolitan centers which have adopted the pass principle for the encouragement of Sunday-holiday riding. On these days, little of the traffic is compulsory. Therefore, it is logical that we should offer a more attractive rate. The Sunday-holiday pass also has been used successfully by short interurban lines, particularly on those entering some terminal city with many entertainment objectives.

Other variations of the pass are the week-end or the Saturday-Sunday pass, being used by a railway which serves a large terminal city, and an evening pass, being used by one railway during the summer months. A few railways have considered nickel fares for short rides within a fair-sized neighborhood center. This is a rather delicate discrimination, because any rate of fare that seems to favor a given neighborhood will be opposed by other districts. Another way of building up off-peak service is offered by the sale of single or round-trip tickets at lower rates if used between certain hours, as from 10 to 4. This plan has been effective on the trolley lines of London. Differential rates as used by gas and electric utilities are being used in other forms by electric railways, but those mentioned are the most popular for merchandising rides.

**Abstract of a paper presented before the annual convention of the Missouri Association of Public Utilities, held at Jefferson City, Mo., April 26-28, 1928.*

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News of the Industry

Seven-Cent Fare Suggested in Dayton

Expert wants railway to carry out $1,000,000 program as part of general traffic improvement scheme

ROSS W. HARRIS, Madison, Wis., has reported on proposed traffic changes in Dayton, Ohio. He suggests rerouting of street cars, coupled with higher fares and better service, parallel parking only, faster signal lights, traffic lanes for automobiles and two new thoroughfares.

By making changes which he suggests Mr. Harris feels certain that automobile speed can be increased 40 per cent in the business district and street car movements downtown can be accelerated materially.

Four street car tickets for a quarter and a cash fare of 7 cents is advised to enable the companies to effect the required routing changes and make necessary improvements in service. Immediate relief of congestion and provision for future traffic needs are both inextricably linked with the street car situation, the report says.

Diagonal parking would be virtually abolished under provisions of the report and downtown thoroughfares, would have double lanes of traffic, moving at 19 m.p.h., in each direction, with the green light showing for fourteen seconds during each cycle instead of for 17½ seconds as it does at present.

Study Covered a Period of Year

On Main Street parallel parking would in turn be discontinued when the need required and that thoroughfare opened for three lanes of automobile traffic in each direction.

Mr. Harris would overcome many of the common forms of automobile and street car delay in the business section by merely speeding up the lights. He says this plan would give users of both types of transportation great relief, without inconvenience to pedestrians. Opening of Second and Fourth Streets as thoroughfares, to widen the neck of the downtown traffic bottle, is recommended.

Mr. Harris was employed jointly by the city and the electric railways early in 1927 to work out the answer to present traffic problems and provide for future traffic needs of the city's rapidly increasing population. It was felt that experienced and constructive assistance was needed to insure a program that would afford immediate relief and insure citizens against future traffic entanglements.

The official report contains 750 pages and represents nine months' work on the part of Mr. Harris and an organization staff. It is supplemented with a voluminous appendix of maps and charts.

Philip H. Worman, representing the companies, estimates the expenditure of more than $1,000,000 on the part of the local railways will be necessary permanently to establish the improved service required in the Harris traffic report. New cars alone would cost the companies about $500,000 and improvements in tracks will require the expenditure of a still larger sum.

To maintain permanently the kind of service called for in the Harris report, the City Railway would have to spend $150,000 for new cars. Likewise to comply with provisions of the report, the Peoples Railway would need twenty new cars at a cost of $200,000 and the Dayton Street Railway would have to make an outlay of $77,500. Since cars of the Cincinnati, Hamilton & Dayton Railway are the last word in car equipment, no changes of any sort would be necessary in handling the passengers on this line.

Commission Reversed in Baltimore Case

Prohibited from limiting rate of fare to be charged. Court regards 8 per cent return as none too liberal

IN A sweeping decision by Judge Joseph N. Ulman in Circuit Court No. 2, Baltimore, an injunction is granted under which the Public Service Commission is prohibited from limiting the fare rate to be charged by the United Railways & Electric Company, Baltimore. The court holds, however, that earnings of the company will be limited to 8 per cent on all the railway's property. No sooner had the court handed down its order than attorneys for the commission announced that the case would be taken to the Maryland Court of Appeals.

Under the action of the court there is nothing which would interfere with the United increasing its fare rate immediately, but Charles D. Emmons, president of the company, announced that no such action will be taken until the Court of Appeals decides the case.

The case grew out of the United's plea to be permitted to charge a straight 10-cent fare. In this action the commission refused to grant the full increase, but allowed a fare of 9 cents or three tokens for 25 cents. Up to that time the fare had been 7½ cents. The company then sought an injunction to restrain the commission from preventing it from charging 10 cents. At the same time two other petitions were filed, one by the People's Corporation and the other by the Socialist Party, each seeking a return to the 7½-cent rate.

Some of the Background

Judge Ulman spent several days in hearing the United case and then handed down his sweeping decision. Under this decision the case was to be remanded to the Public Service Commission for the purpose of taking additional action on the subject of annual depreciation allowance. It was held by the court that the rate fixed by the commission was unreasonable and illegal and that less than 7½ per cent earnings were confiscatory. It also held that an annual depreciation allowance fixed by the commission was based on erroneous and illegal standards. Instead of agreeing to resume the case and take up the questions cited by the court the commission elected to have the subject go direct to the Court of Appeals and notice of appeal was filed.

Harold E. West, chairman of the commission, said that under the ruling of the court it is to be assumed that the commission has no right to fix the rate of fare for the company.

The court said:

This cause having been set down for hearing and coming on to be heard on the pleadings and the transcript of papers and proceedings, including evidence in the case before the Public Service Commission, and having been argued by counsel for the parties, and the court being of the opinion, for the reasons stated in its opinion filed in this case, that the rates fixed by order No. 12,639 of the Public Service Commission passed on Feb. 10, 1928, and said order and prior orders limiting rates charged by the plaintiff (the United) are unconstitutional, unlawful and unreasonable and fail to allow to the plaintiff a fair return on the fair value of its property; and the defendants constituting the Public Service Commission of Maryland having elected not to have this cause remanded to them for further proceedings upon the lines suggested in the courts opinion, but to have the final decree or order entered forthwith.

It is thereupon, by the Circuit Court No. 2 of Baltimore City, judged, ordered and decreed that said order No. 12,639 of the commission be and the same is hereby vacated and set aside in so far as the same purports to limit the rates of the plaintiff; except, however, as to that portion of said order which extended the first fare zone on the Halethorpe line to the terminus of said line at Halethorpe, as to which latter provision in said order the bill of the plaintiff is hereby dismissed.

And it is further adjudged, ordered and decreed that the defendants and their successors in office be and they are hereby perpetually enjoined and prohibited against enforcing against the plaintiff the provi-

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sions or order No. 12,639 in so far as the same limit or purport to limit the rates of fare to be charged by the plaintiff, and also against enforcing against the plaintiff the provisions of any prior orders of the commission limiting or purporting to limit the rates of fare to be charged by the plaintiff.

And it is further ordered that the costs in this case be paid by the defendents.

From this action on the part of the court it can be seen that the commission was upheld on only one point—that dealing with the fare to Halethorpe, and that the commission is prohibited from enforcing not only the recent order upon which the court acted but also any orders passed previously.

In the commission's original order an allowance of $883,000 was made for annual depreciation and retirement of the company's property, while the United held it should be $2,200,000, based on present value. It was held by the court that the method used by the commission in arriving at the amount it set was illegal and erroneous. It was decided by the commission that 6.26 per cent was a reasonable return. The court, however, held that the company should be allowed to earn from 7½ to 8 per cent.

Need of Community Confidence Reiterated at Port Arthur

On the occasion of a "red letter" day in Port Arthur, Tex., namely April 21, 1928, when the Eastern Texas Electric Company installed a new railway and bus service J. G. Holtzclaw, manager, made the following statement:

> If a public utility is to survive and fulfill its mission, which is the rendering of good service, it must have community confidence. This confidence, this feeling of trust which is so necessary to success, is won, not by promises made, but by promises kept. This we consider a fair price and again we pay it gladly. When we took over the railway system of Port Arthur we promised new service within three months. The three months have passed quickly. Bad weather at times has threatened delay. Failure of material to arrive on schedule has resulted in temporary setbacks. But at last we can happily and proudly say that again we have fulfilled our pledge!

Parade in Commemoration of Hocker Line Revival

Eight cars were paraded over the Kansas City, Merriam & Shawnee Electric Railway, the rehabilitated Hocker Line, on May 12, officially opening the interurban road to service. The cars carried officials and patrons of the line, officials of the Kansas City Public Service Company, 200 Kansas City business men and the Kansas City Public Service Company band of 30 pieces. They left Ninth and Wyandotte Streets at 2 o'clock and traversed the line to Rosehill, Kan., its suburban terminal.

Following the parade a barbecue and picnic was held in Shawnee Park, at which M. A. Summermour, Mayor of Shawnee and chairman of the board of directors of the reorganized railway, and other officials spoke. Service on the road was resumed Sunday morning, May 13, after a ten-months suspension.

I.C.C. Against Johnson Measure

Chairman of regulatory body sees need for clarifying bill so as to remove need for commission to take jurisdiction

IN A report to the House committee made public on the so-called Johnson electric railway bill, John L. Esch, chairman of the Interstate Commerce Commission, concedes the need for clarifying the status of electric railways before the commission, but objects to the methods proposed in the bill. In brief, this bill, introduced by Representative Johnson of Indiana, proposes to classify as "commercial electric railways" all lines that approach steam railway practice in magnitude and method of operation and to subject these to the full provisions of the interstate act. Mr. Esch reports:

As a general statement it may be said that the provisions of the interstate commerce act applicable to steam railways are also applicable, with few exceptions, to electric railways. Thus the general provisions relating to the duties and obligations of the carriers, the filing and observance of rates, the joint use of terminals, acquisition of control and consolidations, the pooling of freight, the observance of the long and short haul provisions, the observance of accounting regulations, and the filing of reports, are all as applicable to such electric railways as to steam lines.

In the provisions covering the construction or abandonment of lines, through routing and joint classification, and in the general rate scheme, including the recapture clause, Mr. Esch, however, agrees that exceptions are made in the cases of electric railways. Instead of making general definitions of electric railways to be excluded from this proposed stricter ruling as is done in the bill, Mr. Esch contends that it would be better to define only the included class and to make it incumbent upon the rest to prove their right of exclusion. Mr. Esch writes as follows:

> It is, of course, not an easy matter to define such a class of electric railways, and we do not believe that it could be done with sufficient accuracy without providing for the individual consideration of particular cases by the commission. The best plan that we are able to suggest is to provide that all electric railways having certain characteristics capable of accurate definition shall be included within the class, unless upon public hearing we shall find that particular electric railways coming within the definition are not as a matter of fact affected with an important national interest so far as the purposes in question are concerned.
>
> In arriving at a proper general definition, we think we can start with the premise that participation in general freight service, rather than passenger service, is the thing that brings electric railways within the range of national interest. The next step is that only electric railways which interchange standard freight equipment in interstate commerce, with connecting steam lines, are affected by such an interest. A further step is that only such electric railways as participate in joint interstate freight rates with connecting steam lines need be included; for it seems to us that those whose service is rendered merely by switching or which are content with combination rates on through traffic, are not of such national concern.

Mr. Esch feels, however, that this definition would probably be too broad in practical operation and would include various electric railways which, in fact, are not of national concern for the purposes in these sections. To obviate this difficulty, it seems to him that provision should be made for appeal to the commission which would permit that body, after public hearing, also to exclude until further order such specified electric railways, coming within the broad definition, as are found after taking evidence, not be affected with an important national interest. In conclusion he says:

> This would, it seems to us, put the burden of proving their right to exclusion upon the electric railways where it belongs, instead of reversing the process as this bill proposes and putting the burden on us of combing the entire electric railway field and discovering the particular electric railways which the public interest requires to be classified as "commercial electric railways."

New Traffic Code Recommended for Boston

A revision of many of the present traffic regulations in Boston, Mass., is recommended in a new traffic code compiled by Prof. Miller McClintock, director of Mayor Nichols' traffic survey. The new code contains most of the regular provisions of the present standard code. It also definitely establishes certain arbitrary definitions and standardizes many regulations.

One of the recommendations is that there should be a co-ordinated system of automatic traffic signals operating under progressive timing for various sections of the city. These systems have been worked out and prepared by the survey, which has also worked out special automatic traffic control plans for immediate installation in Governor Square and at the intersection of Cambridge and Charles Streets. The report recommends the designation of certain "through streets" where all vehicles would be required to come to a full stop before crossing unless otherwise directed by traffic lights or a police officer. A new division is recommended in the street commission for the special handling of traffic matters. This would be under the direction of traffic engineer. Reorganization is also suggested in the police traffic division.

Unrestricted parking is permitted in certain sections of the city and no parking is recommended in other sections within an area indicated by official signs. The delivery of goods and the collection of waste materials between 8:30 a.m. and 5:30 p.m. are forbidden except by emergency permit of the street commissioners on specified congested parts of the streets.

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Legislature in Session

Illinois body takes up home rule measures and bills intended to afford means of settlement in Chicago

THE Illinois General Assembly, in special session, has under consideration three bills prepared by the city and intended to give Chicago home rule over public utilities. The special session was called primarily for this purpose and to settle the railway situation there. It convened on May 15 with a large number of members absent, and it seems doubtful whether the session will accomplish anything, owing to the fact that it is called by Governor Small following his defeat in the primary and at a time when members who have been renominated are preparing for their fall campaigns and those who have not been renominated are no longer interested in legislation.

Opponents of the Governor point out that this is the first real attempt he has made in eight years to secure legislation to provide home rule and stress the point that the legislation is sponsored by Mayor Thompson, who backed Small in the recent primary.

At the opening session Mayor Thompson and members of the local transportation committee of the City Council were present. The city's bills were introduced simultaneously in the House and the Senate after the Governor had completed the reading of a message in which he argued for home rule for Chicago and declared himself unalterably opposed to a terminable permit or any other franchise without a fixed term. The bills authorize Chicago to create a regulatory commission vested with the same power as the State Commerce Commission to govern utilities operating in the city. They also repeal the twenty-year limitation on franchises and give the Council the right to grant a franchise for any fixed period.

Two other bills are to be introduced later providing for a consolidation of the surface and elevated lines and authorizing the construction of subways by special assessment.

No Seven-Cent Fare in Detroit Now

No need exists at present to increase fares on the Detroit Municipal Railway, Detroit, Mich. This is the opinion of the Street Railway Commission, although two members of the three-man board believe an advance in fares would justify itself. Ogden Ellis, chairman of the commission, is quoted as follows:

> While an increase in fare would benefit the city by allowing the department to make developments, there is no probability of an immediate raise. I am not sure that there would not be a certain amount of opposition in some quarters to boosting fares. I haven't inquired. Of course if an increase were necessary the commission has the power to act. The fact of the matter is, the fare is going to stay at 6 cents for the time being at least.

John J. Barlum, another commissioner, had much the same to say. While he is of the opinion that it would be wise to establish a 7-cent fare and maintain it for two years, for the purposes of providing service for outlying districts, purchasing new equipment and repairing old and making adequate payments into the sinking fund, there will be no change in fare before fall, he declared. He is said to feel that if the 7-cent fare could obtain over a two-year period there could be a 5-cent fare.

Enterprising Scheme to Boost Railway in Clarksville

An ingenious plan and a co-operative spirit have spelled salvation for the Citizen's Railway operating in Clarksville, Tenn. Twenty-one individuals with "interested" citizens have composed a committee which is to investigate the public sentiment and possibility of substituting buses for the two cars which operate on approximately 3 miles of line and haul about 125,000 people annually. The committee is to have a month for its investigation and recommendations and during that time the 21 citizens and firms will contribute $5 each for maintenance of the system against its daily operating deficit. They even pledged a continuance of the contributions if the report is not ready at the end of the month.

One of the pledgees stated that he would be willing to donate $250 annually to help defray any deficit provided W. E. Beach, who served without compensation as president since 1916, would continue in office. The president suggested that the service be discontinued for a period of 30 days, following the close of the city schools.

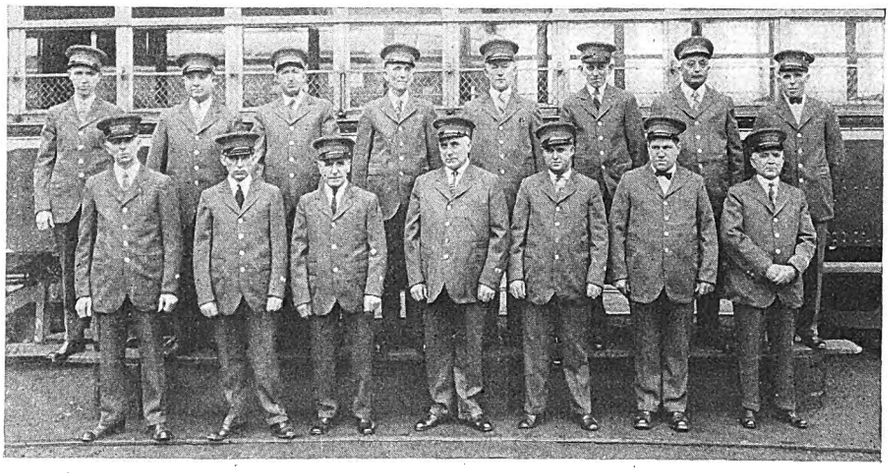
Contest in Cincinnati Extended

An extension of time up to June 30, 1928, has been allowed for the contest open to every member of the Cincinnati Street Railway, Cincinnati, Ohio, covering ideas on selling rides. In the May issue of the *News*, the official paper of the company, readers are told that their ideas might be worth $10 and that they should be sent in to the Contest Editor, 804 Dixie Terminal.

New Uniforms for East St. Louis Employees

A departure from the usual in electric railway apparel is seen in the new uniforms being worn by all platform men and supervisors of the East St. Louis Railway and Belleville division of the East St. Louis & Suburban Railway, East St. Louis, Ill. Instead of the dark serge material the new toggery is made of the popular and durable olive-drab whipcord cloth. The caps are of the semi-military style with the operator's badge on each side instead of across the front, as formerly was the custom. Four-button cutaway is the style of the coats. All buttons bear the nickeled monogram of the affiliated East Side Electric System.

A distinctive feature of the new uniforms is the service star worn on the left sleeve. Each silver star worn represents five years' service with the company, the five-star-cluster indicating that the wearer is a member of the company's Twenty-five Year Club.



Natty appearance of railway employees in East St. Louis in their new uniforms

Judah Street Extension in San Francisco Under Way

After a year's delay work has been started and is being pushed by contractors on the Judah Street extension of the San Francisco Municipal Railway, San Francisco, Cal. It is expected that cars may be running by Jan. 1. The plea of Reuben Hunts, "A taxpayer," for an injunction was denied by the California Supreme Court, the court ruling that the work could be financed out of city moneys on bond. The Municipal Railway was declared to be a unit and not a group of operating lines as contended by Mr. Hunt. Further litigation was avoided by a conference between attorneys for Mr. Hunt and City Attorney O'Toole, as a result of which it was announced that no other legal action would be brought to impede the work.

Judah Street will be paved from Forty-first to Forty-eighth Avenues. Some of the trackage has already been laid. The extension will serve the newly built Sunset district.

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Electrification at New York Plan Report

Electrification of all railroad lines in New York City and its suburbs, elimination of grade crossings at the intersection of railroads and main highways, and unified management and operation of railroad transportation in the environs of New York, are some of the outstanding needs cited in the report on "Transit and Transportation" prepared by the Regional Plan of New York and Its Environs as the result of six years' study, the second section of which was made public May 14. The report says:

One of the plans calls for a new subway system for the exclusive handling of package freight, coal, building materials and waste products. This plan proposes the use of small cars of about 10-ton capacity, with demountable bodies which could be transferred from the subway chassis to motor truck chassis for short hauls on the street surface.

The second plan for freight distribution would create a system of inland freight stations in combination with industrial terminal buildings, such as have been proposed by the Port of New York Authority, and toward the carrying out of which considerable progress has been made. It is expected that these would release much of the water front of Manhattan and New Jersey for the development of steamship terminals.

The third plan calls for the construction of double-deck piers, containing two float bridges, and connected at the second story level with freight terminal buildings on the inland side of waterfront streets.

The fourth proposal suggests the establishment of a large terminal on the west water front of Manhattan, which would connect through a fleet of rapid-scheduled motor floats with all the New Jersey railroads and the New York Central Railroad.

The regional planning body does not indicate which of these proposals it considers most desirable, but definite recommendations on the subject will be contained in the regional plan itself, which is to be drafted next fall.

100 New Cars for Cincinnati

Telegraphic advices from Cincinnati on May 18 report an order placed with the Cincinnati Car Company for 100 cars to be delivered to the Cincinnati Street Railway next fall to cost $1,300,000.

Old Scale Accepted in New York State

Motormen and conductors on the Syracuse, Rochester and Utica divisions of the New York State Railways accepted the proposal of the company that the existing wage contract be renewed for another year. The contract is in contrast with an increase of 8 cents an hour asked by the men. The company claimed it was unable to meet the requested increase because of paving costs and increased competition from automobiles.

More than 2,000 men are affected by the agreement. The so-called working terms of the new contract will differ only slightly from the ones in force the last two years.

Lower Fares in Massachusetts

Trustees of the Eastern Massachusetts Street Railway have announced a reduction of fares on part of its lines in Melrose, Mass., through the issuance of thirteen-ride tickets to cost $1. The lower fares will be effective on May 23. Aldermen of Melrose recently petitioned the company for reduced fares and also asked for lower fares on two other lines with transfer privileges. These two reductions with the transfer privileges the railway management did not see its way clear to grant.

Both Sides in Fort Wayne Wage Issue

Attorneys for the Indiana Service Corporation, Fort Wayne, Ind., at a recent hearing before the Indiana Public Service Commission, said that higher fares would follow higher wages. They opposed a wage increase which had been sought by employees. Attorneys for the employees said they should be granted the wage increase regardless of the financial condition of the company. Men are seeking a scale of 65, 67½ and 70 cents an hour.

Arbitration in St. Louis

Mayor Victor J. Miller of St. Louis, Mo., on May 16 induced representatives of the St. Louis Public Service Company and the Amalgamated Association to agree to submit their differences to the Missouri Public Service Commission for arbitration. The directors of the railway must also ratify the action of the company officials at the Mayor's conference. This will be done immediately. Briefly the agreement provides:

The city, union and company will submit the wage scale to the Missouri Public Service Commission for arbitration.

Railway officials will ask the directors to authorize them to extend the present contract with the union indefinitely.

The city agreed to intervene as an interested third party and request a speedy and satisfactory settlement of the controversy.

In the meantime the existing wage scale will prevail and any award made by the state commission shall be retroactive as of June 2.

In page advertisements inserted in all of the St. Louis newspapers on May 14 the company stated its position and defended its action in demanding that the workers accept an 8.4 per cent average reduction in wages to be put into effect on June 3.

It is believed that the Missouri Public Service Commission will decide prior to June 1 the question of raising fares in St. Louis to 8 cents flat from the present rate of 8 cents cash with two tokens for 15 cents.

Rapid Transit Survey in St. Louis Approved

The ways and means and a special rapid transit committee of the St. Louis, Mo., Board of Aldermen approved May 11 Mayor Victor J. Miller's bill for a rapid transit survey at a cost of $50,000. The vote was twelve to one. The bill provides for a Transportation Survey Commission to include the Mayor, comptroller, presidents of Board of Aldermen and the Board of Public Service, a representative each of the Missouri Public Service Commission, the St. Louis Public Service Company, City Plan Commission, the director of streets and sewers and seven private citizens.

Franchise Negotiations in Jacksonville Suspended

Negotiations between the City Council and the Jacksonville Traction Company, Jacksonville, Fla., for a new franchise covering operation of the railway system have been suspended pending further investigation of the valuation and other matters by a committee of the Council.

Councilman Hamphill had introduced figures stating that the valuation of the company in 1924 had been placed at $4,136,180 in the hearing to determine whether the company was entitled to a higher rate of fare, that the citizens' committee of Jacksonville had valued the property at $4,557,132 and that the statement of the company to the state of Massachusetts placed the assets of the company at $4,783,611.

At a prevous session Mr. Knight had said that the company would accept a valuation for rate-making purposes on its property of $5,900,000 and desire authority to earn 9 per cent on that investment. He followed with a review of the action of the Railroad Commission in 1918 in allowing a 7-cent fare after the company had gone into receivership and stated that the valuation reached by the commission and the company differed only $58,000. Despite the aid given by the commission then and in 1924 in allowing increased fares, the company has not paid dividends on its common stock since 1914 and preferred stock since 1916 and lost $32,000 last year, he said.

New Office Quarters for Brooklyn Companies

New offices of the Brooklyn-Manhattan Transit Corporation and Brooklyn City Railroad were established May 14 at 385 Flatbush Avenue, the latter company occupying the third and fourth floors and the B.-M. T the six floors from the fifth to the eleventh in the Paramount Building. Formerly the two companies occupied two interconnecting buildings at Clinton and Montague Streets. The offices of the B.-M. T. had been established at 85 Clinton Street since 1905. The Brooklyn City Railroad occupied the building at 168 Montague Street since 1892.

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Joint Consolidation of Harbor Operations in Los Angeles

The railroads and railways serving Los Angeles, Cal., harbor joined in applying to the Interstate Commerce Commission on May 9 for permission to consolidate their water front operations. The Los Angeles Harbor Commission will participate in the project. Under the amendment the Southern Pacific, Santa Fe, Pacific Electric and Los Angeles and Salt Lake systems will organize the Harbor Belt Line Railroad. The application explained that an expenditure of $145,000 would be necessary for the construction of new switch tracks and connections. The balance of the belt line property will be made up of contributions of line from the other railroads and the utilization of tracks owned by the harbor commission. Reference to the planning of this line was made in ELECTRIC RAILWAY JOURNAL, issue of March 3, 1928, page 373.

Stations Located for North Jersey Line

Twenty-four stations along a 16-mile right-of-way have been tentatively named by the North Jersey Transit Commission in making known further plans for a rapid transit line proposed along the Palisades ridge from Bergen Point to Fort Lee.

Four stations are proposed for Bayonne, eight for Jersey City, five for Union City and two each for West New York, North Bergen, Fairview, Cliffside Park and Fort Lee. Guttenberg, which occupies a narrow strip of territory between West New York and North Bergen, will be served by a station in West New York five blocks from the city line, and one in North Bergen three blocks from the city line. Joint stations serving two communities are planned at the Jersey City-Union City, Union City-West New York and North Bergen-Fairview city lines.

The route is planned as a subway for almost its entire length. It is laid out so as to serve an area of 20.7 square miles containing a population of approximately 500,000 persons.

Massachusetts Governor Insists on Elevated Legislation

Governor Fuller of Massachusetts is understood to be preparing to send a special message to the Legislature requesting that every effort be made to enact Boston Elevated Railway legislation at the present session, and outlining his views for consideration by the House and Senate. Since the Legislature killed all Elevated legislation in the House the Governor has declined to make his plans public, but he has much to say on the subject in speeches he has made about the need for settling the matter of whether public control of the road shall continue.

In speeches last year and early this year the Governor has threatened to keep the Legislature in session until some Elevated legislation reaches him. He has also said that if the Legislature failed to pass a bill he might feel himself forced to run for a third term as Governor, as he felt he should not leave the office until the Elevated problem is settled.

Transit—A Factor in Community Development

Supervisor of public relations at Buffalo explains company's plan for community development through helpful co-operation

A CAMPAIGN to help the city develop along sound lines through a knowledge of its advantages and a unity of thought and action has been running in cars and buses of the International Railway, Buffalo, N. Y., for several weeks. The purpose is to develop a better understanding of mutual interests in the prosperity of the community and to promote unified effort toward advancement of all interest on the Niagara frontier.

Still more recently the railway has taken another step in this campaign, soliciting the co-operation of moving picture theatres, radio stations and newspapers. As a result the Buffalo Theatre and the Hippodrome in Buffalo are displaying one of these messages at each performance. The Buffalo Evening *Times* is using daily one of these slogans on its front page and station WMAK is signing off nightly with the same message. In these latter developments the railway does not appear at all, the message simply being signed by the organization sponsoring it.

THREE-SIDED RESPONSIBILITY

Thus did Walter McCausland, supervisor of public relations of the railway, explain in part the program of his company for community betterment in a recent address before the Niagara Falls Rotary Club. Among other things he said:

The railway's place in the community may be more clearly visualized when I inform you that this last year the high-speed line between Buffalo and Niagara Falls carried 2,500,000 passengers while the new de luxe limited bus line carried 60,000 more. The International Railway also operates the local service in Niagara Falls and welcomes your comments and suggestions regarding this feature of its work.

As taxpayers you will be interested in the fact that we pay to Niagara Falls in school, county and state taxes $46,000. Last year your city was beautified and traffic conditions were greatly improved by the additional facilities supplied at the American end of Falls View Bridge. Similar improvements are now being completed at the Canadian end of the bridge.

The employees as well as the management have expressed their desire to participate in the activities of the community. Last year we made up a special fund for the organized charitable drives in the communities served by the company. The management matched their contributions dollar for dollar, and the first check drawn from the new fund was for the Niagara Falls community chest.

The speaker mentioned these things not to tell how good the company is, but merely to emphasize the mutual interest. He said further:

It may surprise many to learn that the International Railway carries daily 500,000 passengers on cars and buses of the Niagara frontier. To put the figure another way this is practically equivalent to the population of Buffalo or in the course of a year 1½ times the population of the United States.

Of this tremendous throng of daily riders, more than one-half ride within two hours in the morning and two hours in the evening.

Mr. McCausland then discussed the facilities of the company for coping with the physical problems before it.

Speaking along somewhat similar lines Mr. McCausland addressed the Mercer Club on "Some Human Aspects of the Transit Business." He referred to the $375,000 track and paving program and to the safety record of the Broadway carhouse. In concluding his address he said that International Railway Company men and management pledge themselves to the following policy:

To the Public—

To furnish an adequate system of transportation, operated by efficient and courteous employees, and to improve service to the fullest extent that such improvement can be supported by the fare collected.

To the Employees—

To pay wages adequate to the necessities of life and comfort, and sufficient to permit of reasonable savings. To provide opportunity for participation in increased earnings made possible by the increased effort of the employees, and to encourage the investment of this added compensation in such a way as to make the employees owners as well as workers.

To the Owners—

To pay a reasonable return on the actual value of International Railway Company property, in justice to those who made the company possible in the first place, and in order to keep its credit at a point which will assure the continuance of a high standard of public service.

Ten-Cent Fare Asked in Hamilton

Fares of 10 cents or three tickets for 25 cents on street cars and 15 cents on buses or two tickets for 25 cents are the rates which the Hamilton Street Railway, Hamilton, Ont., will ask when its application for an increase in fares is considered by the Ontario Railway Board. The company will also request that children's fares, at present rating at ten for 25 cents, be changed to six tickets for 25 cents. The present fare in Hamilton is 5 cents. being the only city in Canada with a 5-cent fare. Civic officials are said to appreciate the fact that the company is entitled to redress through an increase in fare, but are understood to feel that a rate of 10 cents is too high.

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Recent Bus Developments

Bus Program Ahead in St. Joseph

The ordinance introduced before the City Council of St. Joseph, Mo., at the instigation of the St. Joseph Railway, Light, Heat & Power Company making it possible for the company to use buses as co-ordinate units of the railway system was passed recently. At the same time the Council repealed the ordinance against buses passed in the days of the jitney.

C. A. Semrad, general manager of the company, said that if this ordinance and one to repeal the ordinance regulating self-propelled vehicles carrying passengers for line, so as to prevent the operation of such vehicles paralleling car lines, were passed the company would establish a temporary bus line on Grand Avenue to replace the railway within two weeks after the passage of the bills.

Four buses, to cost $25,000, will take the place of the three cars which now run on the line, the shortest of the system. It is proposed so to route the buses that the tracks will be followed only from the downtown district to Tenth and Powell Streets.

Mr. Semrad declares motor vehicles as substitutes for cars on the Union line is impracticable, because of the long distance to be traveled, and the large number of passengers. The present Union line is 7 miles in length, with one smaller line at the north end and two at the south end.

Only one bus line is operated in St. Joseph at present, between the end of the Frederick Avenue car line and the state hospital. An extra charge is made for transfers.

Line in Lowell Approved

A vote allowing the Eastern Massachusetts Street Railway to operate a bus line through Andover Street to the City line has been taken by the city of Lowell, Mass. A hearing was set for May 15 on the railway's petition to run buses to the Billerica line.

Co-operating With Plane Service in Detroit

During the all-American Aircraft Show held in Detroit, Mich., from April 14 to April 21 a special bus service was established between the Airport and Convention Hall on Woodward Avenue, a distance of about 13 miles, by the Department of Street Railways. The service, which was supplemental to the regular de luxe coach operation, which the department has been operating between the hotel district and the Ford Airport for the past year, was well patronized by out-of-town visitors to the show who desired to inspect the airport. Another de luxe type coach to handle the increased volume of traffic that the Department of Street Railways is transporting to the airport was recently purchased. These two units maintain an hourly schedule for the accommodation of passengers traveling the route of the Stout Air Services, Inc., on their regularly scheduled planes between Detroit and Cleveland.

City Suggests Buses on Denver Line

The city of Denver, Colo., has asked the Denver Tramway to substitute buses for its electric railway cars on the Globeville suburban line. This suggestion followed a protest by the company of the request by the city for a contributor to the expense involved in the work of building a new viaduct leading to Globeville.

Joint Coach Service Effected in Los Angeles

A change in coach service was effective May 4, when the operation of the Wilshire Boulevard and La Brea Avenue Motor Lines was taken over by the Los Angeles Motor Coach Company, in which the Los Angeles Railway and the Pacific Electric Railway are each one-half owners. At that time the Wilshire line was extended from Fairfax Avenue along Wilshire Boulevard to Santa Monica Boulevard, in Beverly Hills. Eight new double-deck coaches, costing approximately $100,000, are being provided by the Pacific Electric Railway and the Los Angeles Railway to take care of the additional service. All of the Los Angeles Railway double-deck coaches will be used on the Wilshire Line.

Application for this joint service was referred to in the ELECTRIC RAILWAY JOURNAL, issue of April 28, 1928, page 711.

One System Suggested for Knoxville

Experts retained by city frown upon any plan that would contemplate competition provided local railway is willing to put on four suggested bus routes

CO-ORDINATION of the city's transit facilities is recommended for Knoxville, Tenn., in the report of Harland Bartholomew & Associates. The report really is the outcome of the situation created by the desire of the Knoxville Rapid Transit Company to secure operating right for local bus lines, some of which would be competitive with the railway lines of the Knoxville Power & Light Company. The Council was not disposed to proceed in the matter, however, until it had the benefit of outside suggestions. Hence the report now presented.

The report will be placed by the Council bus committee before Power-Light officials to ascertain if the company will agree to put on the bus lines recommended for immediate installation. If Power-Light will not agree to put on four lines recommended for immediate installation, the report suggests that an independent system be enfranchised by the city.

The four lines recommended extend into the Beaumont section; into Lonsdale; out Sevierville Pike, and northward from the terminus of the Sixth Avenue car line to Whittle Springs.

The Bartholomew report outlines and recommends nine bus lines for an independent system, in case a co-ordinated bus system can not be agreed on.

The report finds in the repeated eliminations of competing lines in Knoxville's transportation history through numerous consolidations a "striking example of the experience of nearly every city where electric railways are now in operation." The report says:

> Cities have come to realize that the electric railway is a natural monopoly subject to reasonable regulations. The economic problems that brought about the unification of gas, water, electric and telephone services are identical with those supplying urban transportation. The city must be served as a unit if duplication of effort is to be avoided and convenient and efficient service provided at a minimum cost. Competition among local utility companies adds to the cost of operation and makes it impossible for the competing companies to earn sufficient revenue to keep their properties in good operating condition.

DANGER IN COMPETITION

As evidence of the economic results that might be expected should an independent bus system be enfranchised in Knoxville, the report gives the number of passengers carried on the various Power-Light lines a day and the number of seats available:

Seats	Passengers	Excess Seats	Per Cent Vacant
83,803	45,490	38,113	46

The maps in the report show that the six bus lines proposed by the Rapid Transit Company duplicate some lines for their entire length. Yale and Highland lines are the only two where duplication in whole or in part does not occur.

In order to extend transportation service into areas now needing service and not now served, the report recommends installation of six supplemental bus routes, and declares four are needed immediately.

The report recommends that the interurban bus lines carry local passengers within the city on certain routes outlined. It recommends that the terminal location of these lines be changed from State Street to a point west of Gay

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Street, and somewhere in the square bounded by Main, Union, Walnut and Henley. All interurban buses then could be eliminated from Gay Street.

As stated before, the report suggests that if no agreement with Power-Light for installation of bus lines can be reached, a franchise be given to an independent company. In this connection nine routes are traced out, based on the maximum service, economy of distance and time, and grade and street conditions. It is proposed to permit buses on these routes to traverse Gay Street until Henley Street is widened and opened and the Henley Street bridge is built. It is proposed, too, to have buses on these routes follow certain loopings in the business section, so that no route will extend through the business section to an objective on the opposite side.

The railway company applied on April 23 for a charter for the Knoxville Motor Coach Company which would be the name of a subsidiary bus operating organization if the Council gives the necessary franchise.

Conference on Substitution by Bus in Ohio Territory

A committee to confer with the Buckeye Stages, Inc., on a franchise for Columbus-Westerville, Ohio, bus service has been appointed by the Westerville Council, which voted for substitution of bus for street car service. Service at present is being supplied by the Columbus Railway, Power & Light Company, but no franchise between this company and Westerville has existed since 1915. Westerville is 14 miles north of Columbus. The matter will be placed before the Ohio Public Utilities Commission.

California Commission Explains Denial of Petitions

The California Railroad Commission has denied various petitions for rehearing the application of the Key System Transit Company for a certificate to operate bus service from the City Hall in Oakland to Alameda. In so doing, however, the commission ordered that when application was made by the utility for a supplemental order approving the routes of the proposed bus service in Oakland and Alameda the matter would be re-opened for further hearing.

Would Increase Feeder Lines in Chicago

Extension of surface lines by the establishment of feeder bus routes was urged by the Chicago City Council committee on transportation at a recent meeting attended by a group of business men from the northwest side who have been petitioning the committee for some time to establish routes. Installation of four routes has been ordered by the Illinois Commerce Commission. The form of the ordinance was approved by Harry P. Weber, attorney for the Chicago Surface Lines, and James W. Breen, assistant corporation counsel.

Replacement in Atchison

Story of a Kansas town in which change-over was deemed desirable —Eleven miles of route

BUSES have relegated to oblivion the thread-bare and derided railway system operated at Atchison, Kan., by the Kansas Power & Light Company. Whether the buses are enjoying present popularity because they represent progress in transportation or novelty remains a matter for conjecture. The old mule cars in Atchison enjoyed similar public acclaim in the beginning and then became the handy butts for commedians' jokes just as the street cars have been for several years.

Thirty-four years ago Atchison held promise of stepping longside Kansas City in population and the coming of the railway was believed to herald great things for the future, and it did. The memory of those early days caused some display of sentiment among the older residents but the buses are new and shiny temptations to ride.

Probably the private auto can be blamed for the death-blow. When a considerable portion of the population became owners of motor cars, electric railway patronage went into a tail-spin that was fatal. Decreases in revenue were accompanied by an increase or at the least a standstill in operation costs.

Officials of the company were loath to spend money. Service and patronage became a game in which each kicked the other farther down the hill. At last it became necessary to make wholesale replacements or abandon the entire system. Company officials are believed to have decided on the replacement because it entailed less initial outlay than would have been needed to rehabilitate the railway.

Slightly less than two years ago two electric lines into north Atchison were abandoned, the tracks torn out and replacement made with buses. One bus was made to serve the combined territories of the two car lines by extending its route. Last summer another line was replaced with a bus. This spring the three remaining electric lines were abandoned and their territory covered by two bus routes, each bus extending its territory. The equipment of the railway was junked wholly.

The fare remains at 10 cents just as it was for the street cars, but the buses are enjoying greater patronage. They are Yellow Coaches, type X, with a capacity of 21 passengers each. Four are kept in active service while a fifth is held for emergencies. The buses cover an entire route of 11 miles on a fifteen-minute schedule.

Two of the former motormen were retired on account of their length of service, and the others were drafted as bus drivers. L. M. ("Curly") Bliss, one of the retired motormen, had been driving a street car since the system was started 34 years ago.

Interstate Legislation Goes Over Till Fall

FURTHER consideration of the Parker interstate bus bill will be postponed until Congress meets again next December. The interstate and foreign commerce committee of the House so decided in executive session May 15. In explaining this action, Representative Parker of New York, chairman of the committee, stated that there are too many conflicting ideas in the committee on the subject to achieve any harmony of opinion this session. "We can get much more satisfactory action next fall," he said. He also pointed out that even if the House passed the bill this session, the Senate would probably not to be able to do anything about it as the committees of that body which are to conduct hearings on the subject have been tied up with other bills.

Additional Service in Rensselaer

The Public Service Commission has amended the certificate of the Capitol District Transportation Company, Inc., subsidiary of United Traction Company, governing its operations in Rensselaer, N. Y., by authorizing the company to establish bus service on certain additional streets in that city. The service was requested by the Mayor of Rensselaer because of growth in the section to be served.

Ruling Awaited on Muncie Buses

Final hearing in the suit of the Equitable Trust Company, New York, trustee for the holders of mortgage bonds of the Union Traction Company of Indiana, Anderson, Ind., seeking an injunction against Sumner B. Denney and others operating bus lines in Muncie, Ind., in competition with buses owned and operated by the railway has just been concluded in Federal Court in Indianapolis. The suit was heard by Judge Baltzell some time ago and he returned a decision that the federal court had no jurisdiction in the matter. On appeal to the Circuit Court of Appeals at Chicago by the complainant, the higher court held that the issue was within the jurisdiction of the district court and remanded the case for trial.

Occupation Tax on Interstate Bus Not Valid

Municipalities may not impose a license tax on buses operating in interstate commerce, the United States Supreme Court ruled on May 14 in the case of Otis Sprout, bus operator, against the city of South Bend, Ind. This decision reverses the findings of the State Supreme Court of Indiana. Sprout, who operates a bus between

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South Bend, Ind., and Niles, Mich., paid the state registration fee but refused to apply for the city ordinance. The Supreme Court says:

Exaction of the license fee cannot be sustained either as an inspection fee or as an excise for the use of the streets of the city. It remains to consider whether it can be sustained as an occupation tax. A state may, by appropriate legislation, require payment of an occupation tax from one engaged in both interstate and intrastate commerce and it may delegate a part of that power to a municipality.

But in order that the fee or tax should be valid, it must appear that it is imposed solely on account of the intrastate business; that the amount exacted is not required because of the interstate business done; and that one engaged exclusively in interstate commerce would not be subject to the imposition. The Supreme Court of Indiana, far from construing the ordinance as applicable solely to buses engaged in intrastate business, assumed that it applied to buses engaged exclusively in interstate business and that Sprout was so engaged. The privilege of engaging in such commerce is one that a state cannot deny. A state is equally inhibited from conditioning its exercise on the payment of an occupation tax.

Discontinuance of Line in Santa Barbara Approved

The Santa Barbara & Suburban Railway has been authorized by the California Railroad Commission to discontinue operation of its State Street bus line in Santa Barbara on five days notice to the public.

Bus Line Proposed in Amsterdam

A hearing was held before the Public Service Commission May 15 on the application of the Fonda, Johnstown & Gloversville Railroad to reopen the case for consent to abandon the Vrooman Avenue line in Amsterdam, N. Y. The commission approved the former application of the company for abandonment in an order on Sept. 1, 1926, but this order was rescinded on Nov. 10, 1926, when the commission permitted the company to increase its passenger fares in Amsterdam from 8 to 10 cents. The commission held at that time that the company should continue to operate the Vrooman Avenue line for a time under the new rates to ascertain whether further operation would be profitable.

At the latest hearing the company presented figures indicating that there was an operating loss on all of its lines in 1927 of $33,493, notwithstanding the increased fares, and that the revenues on its Vrooman Avenue line decreased from $32,338 in 1925 under the 8-cent fare to $30,314 in 1927 under the 10-cent fare. According to the company's figures, 715,780 fewer passengers were carried on all of its railway lines in 1927 than in 1926.

It was stated by J. Ledlie Hees, president of the company, that an application would be made to the city authorities for consent to operate a bus line in the territory where abandonment is now proposed.

Financial *and* Corporate

Reorganization of Massachusetts Line Underway

Milford & Uxbridge Street Railway changes name under new management. Extensive rehabilitation plans projected

A REJUVENATED era in rapid transit by both electric car and bus is hopefully looked for by residents in the vicinity of Milford, Framingham, Hopedale and Uxbridge, Mass., as the result of the reorganizing under new management this month of the old Milford & Uxbridge Street Railway, which has been authorized by the State Board of Public Utilities to assume the name of the Milford, Framingham, Hopedale & Uxbridge Street Railway.

The property of the company was sold in February in the Massachusetts Supreme Judicial Court to the Citron-Byer Company. The old Milford & Uxbridge lines had been in a receiver's hands since early in 1926 and while it often appeared that another old New England electric railway would abandon service it now has every appearance of becoming a successful venture once more.

On May 1 the lines were taken over by the new owners and almost immediately a petition was filed to change the name. Under the reorganization plan the new owners were authorized to issue first mortgage bonds of a par value of $125,000 and common stock valued at $125,000, giving the new owners an opportunity to realize new capital of $250,000 for the improvements planned. Walter L. Adams, receiver of the company, was named president of the new company. He will also act as general manager. Israel Citron is treasurer. Mr. Adams is a resident of Milford who has long been interested in putting the line on its feet financially.

One of the officers speaking of the reorganization said:

We are interested in putting this service back on a firm foundation not only from a personal financial standpoint but from a community's standpoint. Today a community without rapid transit is lost. While bus operation is successful in some ways it cannot take the place of trolleys in cheap, fast, mass transportation. The new name was decided upon as it gives each of the principal communities in which it operates, equal recognition. All that we need now is the co-operation of the public.

Incidental to the reorganizing of the railway the new owners have organized the Milford, Framingham & Uxbridge Coach Company. It is capitalized at present for $50,000. Through motor coaches the company hopes to coordinate with railway service feeding the railway lines and succeeding rail service where it is found necessary to abandon it. Mr. Adams is president of this concern and Attorney Frank P. Ryan, Worcester, is secretary-treasurer.

While loss of patronage forced the old management to increase fares in several zones the new company has already taken steps to effect a universal 10-cent fare with transfer privileges. It hopes that the volume of business will overcome the loss where a 13-cent fare has been in effect. The company, it was pointed out, has an annual payroll of about $100,000.

In general the new owners have discontinued several round trips, added others at different hours, speeded up the time, perfected timetables and are planning modern roadbed improvements and equipment economies. All lines taken over by the new company are being operated and a survey during the next few months will determine the policy in maintaining them further. Purchase of new cars is under consideration.

Merger in Ohio Declared Operative

The merger of the Penn-Ohio Edison Company and the Northern Ohio Power Company was declared effective on May 15. Under the plan, each share of Northern Ohio capital stock was exchangeable for two-thirds of a share of Penn-Ohio common plus an option to purchase one-third of a share of the latter company on a sliding price scale. Stockholders who have deposited may exchange deposit receipts at the office of the Bankers Trust Company for Penn-Ohio stock and options. Other stockholders have until June 11 to make the exchange.

New Preferred Offered by Illinois Power & Light Corporation

A new offering of 364,740 shares of Illinois Power & Light Corporation, Chicago, $6 cumulative preferred stock was announced on May 3 by a Chicago syndicate headed by Blyth, Witter & Company, and including Field, Glore & Company, Utility Securities Company and E. H. Rollins & Sons. Of the total shares offered, the Illinois Power & Light Corporation has reserved 74,740 shares for exchange or sale directly by the corporation. Proceeds from the sale will be used to retire the $33,000,000 7 per cent cumulative preferred stock.

Lincoln Road Returned to City

The Illinois Public Utilities Company, operating the electric railway service in Lincoln, Ill., the last three years, has given notice that it will turn the property back to the city. C. E. Steinfort, manager, told the Council that the line had been losing money constantly and that the company had decided to relinquish the property to the municipality. The Council has not indicated what action it will take.

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Sale of Indiana Road at Foreclosure Protested

Protest against the manner in which the property of the Indianapolis & Cincinnati Traction Company, Rushville, Ind., was sold at the receiver's auction and a request for the Public Service Commission to disapprove the transfer were contained in a petition filed with the commission on May 10 by George A. Voight, Jeffersonville, Ind., holder of $17,000 in bonds. He alleged that the sale of the property was advertised improperly and to the disadvantage of persons interested; that the price received was much less than a fair value of the cost of replacement, and that the lines actually are in good condition. Sale of the lines without the approval of the commission made the transaction void, he asserted. He wants operation stopped until an investigation has been made by the commission.

Service Abandoned on Nebraska Interurban

Acting on authority of the Nebraska Railway Commission, the Omaha, Lincoln & Beatrice Railway abandoned its service May 12. Junking of its rails will not be completed, however, until the Interstate Commerce Commission permits abandonment of the service on a part of its rails to the steam railroad companies for handling freight to and from industry tracks. Originally planned as an interurban to connect the three cities named in its corporate title, the road was never built beyond the suburbs of University Place and Bethany, out of Lincoln. In its decision the commission found that it was without authority and unreasonable to require the company to operate at a loss.

Authority was given the Lincoln Traction Company to serve that portion of the vacated territory it did not previously reach by adding three new buses. These will be used to give extended service in the agricultural college line, for another mile, and to reach all portions of Bethany by extending its bus service from the south section to the northern limits.

New Haven Optimistic

Earning capacity of Springfield and Worcester systems is expected to improve as a result of rehabilitation

CO-ORDINATION will give the best service at the lowest cost and result in the most net revenue. This opinion is expressed in the report of the New York, New Haven & Hartford Railroad for the year ended Dec. 31, 1927, by E. J. Pearson, president. He said that earnest consideration had been and was being currently given to the operation of the electric railway properties and to the changing conditions of highway transportation by automobiles and buses which might affect the earning power of the electric railways. It seemed fairly clear that electric railways were still the most efficient and economical method of handling the peak-hour travel in cities and that buses were better adapted to the handling of suburban traffic—into, out of and between cities.

The effort of the managements of the railways had been directed toward coordinating city operation by street cars with suburban operation by buses and the whole with the bus operation of the New England Transportation Company and the rail operation of the New York, New Haven & Hartford Railroad.

During the year, the Springfield Street Railway, the Worcester Consolidated Street Railway and the Berkshire Street Railway had caused to be refunded a part of their respective bonded indebtedness. Material economies had been effected by the electric railways through increased use of one-man safety cars of the latest design, equipped with front entrances and automatic rear exists. These cars were lighter than the old type of two-man cars, consequently used less power and through a modern device of automatic exits reduced delays to a minimum.

Operating revenues from rail service of the Connecticut Company, one of the largest subsidiaries, decreased in 1927 more than $650,000, due largely to the favorable weather conditions for continued use of privately owned automobiles during the winter months; this was offset in part by an increase in revenues from bus operations of approximately $200,000. Economies in operation resulted in practically the same net income as last year.

On the lines of the New York, Westchester & Boston Railway 13,032,323 passengers were carried during the year, an increase of 1,346,301. An extension of the road from Mamaroneck to Harrison, a distance of 1.76 miles, was opened for business on July 3, 1927. Extension of the road to Rye, a distance of 1.9 road-miles, is under construction, and will be opened for business about July 1, 1928.

Beginning in April, 1927, the New York & Stamford Railway gradually discontinued service on all of its lines. In September, 1927, operation had been suspended on all except one line, which was discontinued as of Dec. 31, 1927. Motor coaches are now being operated by the County Transportation Company, a subsidiary, in place of terminated trolley service.

No additional shares of the Worcester Consolidated Street Railway's first preferred stock have been exchanged for preferred shares of the New England

INCOME ACCOUNTS, ELECTRIC RAILWAY SUBSIDIARIES OF NEW YORK, NEW HAVEN & HARTFORD RAILROAD

	Connecticut Company		Berkshire Street Railway		New York, Westchester & Boston		New York & Stamford		Springfield Street Railway		Worcester Consolidated Street Railway	
	Year 1927	Comparison with 1926 Increase or *Decrease*	Year 1927	Comparison with 1926 Increase or *Decrease*	Year 1927	Comparison with 1926 Increase or *Decrease*	Year 1927	Comparison with 1926 Increase or *Decrease*	Year 1927	Comparison with 1926 Increase or *Decrease*	Year 1927	Comparison with 1926 Increase or *Decrease*
Operating revenues:												
Passenger	$13,500,927	*$431,063*	$765,442	*$44,945*	$1,975,293	$235,950	$204,167	*$219,400*	$2,826,272	*$204,175*	$3,069,922	*$57,021*
Other	684,107	*33,583*	33,253	*7,018*	176,134	3,772	2,747	*792*	65,158	*45,472*	119,119	*92,481*
Total	$14,185,034	*$464,647*	$798,695	*$51,964*	$2,151,427	$239,722	$206,914	*$220,192*	$2,891,431	*$249,648*	$3,189,041	*$149,502*
Operating expenses:												
Maintenance of way and structures	1,791,498	*186,402*	107,643	*36,911*	197,106	67,895	37,212	*29,862*	255,747	*84,697*	255,234	*109,923*
Maintenance of equipment	1,990,985	*9,296*	180,837	51,781	290,204	37,632	67,539	*67,267*	398,782	7,635	504,574	*14,932*
Transportation	6,559,397	*214,373*	378,919	*40,976*	714,859	108,779	97,568	*86,223*	1,443,567	*101,812*	1,543,813	*113,033*
Other	1,221,284	55,719	82,379	24,912	296,801	37,366	76,124	4,892	316,750	*25,546*	434,714	72,501
Total	$11,563,166	*$354,351*	$749,779	*$1,193*	$1,498,972	$251,674	$278,444	*$178,460*	$2,414,846	*$204,420*	$2,738,337	*$165,388*
Net operating revenue	$2,621,868	*$110,295*	$48,915	*$50,770*	$652,455	*$11,951*	†*$71,530*	*$41,731*	$476,584	*$45,227*	$450,704	$15,885
Tax accruals	698,934	*91,897*	31,022	*3,608*	229,149	*8,292*	15,243	†*,495*	57,611	*14,658*	$85,980	*2,946*
Operating income	$1,922,934	*$18,397*	$17,893	*$47,161*	$423,305	*$3,658*	†*$86,774*	*$34,236*	$418,972	*$30,569*	$364,723	$18,849
Non-operating income	56,984	*14,669*	2,239	585	15,186	5,708	35,018	32,739	15,116	7,830	25,066	1,399
Gross income	$1,979,918	*$33,067*	$20,133	*$46,575*	$438,492	$2,050	†*$51,755*	*$1,497*	$434,088	*$22,738*	$389,789	$20,248
Deductions from gross income	1,451,900	*25,620*	*313,569	10,987	*2,303,492	108,802	*107,168	*7,825*	242,738	21,830	387,881	23,611
Net income	$528,017	*$7,446*	†*$293,435*	*$57,563*	†*$1,864,999*	*$106,752*	†*$158,924*	$6,328	$191,349	*$44,569*	$1,908	*$3,362*

Italics denote decreases.
†*Deficit.*
*Berkshire Street Railway—deductions from gross income include $210,724 interest accruing to New York, New Haven & Hartford Railroad but not included in income account.
New York, Weschester & Boston—deductions from gross income include $1,215,594 interest accruing to New York, New Haven & Hartford Railroad but not included in income account.
New York & Stamford—deductions from gross income include $53,033 interest accruing to New York, New Haven & Hartford Railroad but not included in income account.

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Investment and Security Company since last year's report. The New Haven guaranty is on 1,115 shares of par value $111,500 of which the New York, New Haven & Hartford Railroad owns 279 shares of a par value of $27,900, leaving the guaranty on $83,600 in the hands of the public. The New England Investment has been unable to earn and pay interest on its gold notes owned by the New Haven road.

The improvement of the Springfield property has progressed during the year, 50 new cars and nine motor coaches having been purchased. The former freight station at Bond Street, Springfield, has been remodeled into an up-to-date coach garage, and a new garage has been constructed at Palmer, Mass. Heavy expenditures have been made for track improvements and construction of new track. Other expenditures have been made which will result in efficiency and economy in operation.

The rehabilitation of the Worcester property mentioned in last year's report has progressed during the year. Fifty new cars and twenty motor coaches have been acquired and twenty-one cars have been converted for one-man operation. A new carhouse and new motor coach garage have been constructed at Worcester. Large amounts have been expended for track changes and new track construction.

While the benefits of these improvements in Worcester and Springfield are not fully reflected during 1927, when the rehabilitation is complete they should result in restoring earning capacity.

Sale of New York Road Under Foreclosure Rescinded

The sale of the property of the Second Avenue Railroad, New York, for $500,000 to Arthur W. Hutchins, representing the holders of $3,116,000 of receiver's certificates, has been rescinded under an agreement that the bid could be withdrawn if the Transit Commission refused to approve the Second Avenue reorganization plan. This was disclosed in a report filed recently in the Supreme Court by John C. Clark, appointed referee in 1921 to sell the railroad upon the foreclosure of the receivership certificate liens. He said that approval had been denied in February.

The foreclosure suit was brought by the committee of certificate holders who obtained the decree of sale after the court held that their liens were superior to those of the holders of $5,000,000 in bonds. To initiate the reorganization plan the committee offered $500,000 for the property, of which $230,000 was to pay accident and other claims and $270,000 the expenses of the proceedings.

The reorganization plan, which failed of endorsement by the Transit Commission, provided for the formation of two companies, one to hold the realty, consisting of the carhouse property bounded by 96th and 97th Streets and First and Second Avenues, and the other to operate the road. Each was to have a financial structure of $750,000 in bonds and 31,400 shares of no-par value stock, ten shares of the latter going to the certificate holders for each $1,000 of certificates. The last report of the road mentioned in the referee's statement was for the year ended June 30, 1926, when the net receipts were $1,650,680 and the net profits $53,318.

Committee Approves Washington Merger

Companies would consolidate as Capital Transit Company on basis of $50,000,000 valuation

THE House Committee on the District of Columbia on May 14, voted a favorable report on the resolution to authorize the merger of railway and bus corporations operating in the District of Columbia. The vote was eight to five, several members of the committee reserving the right to change their votes on the floor of the House when the bill comes up for debate.

Representative Gibson offered an amendment providing that the Capital Transit Company, the new corporation provided for in the unification agreement between the Washington Railway & Electric Company, the Capital Traction Company and the Washington Rapid Transit Company be incorporated by an act of Congress, rather than under the provisions of subchapter four, chapter eighteen, of the code of laws of the District of Columbia, as specified in the resolution and in the agreement.

Representative Combs said that no amendment could be incorporated in the agreement by the committee because the committee had only the right to approve or disapprove the agreement. He said that if the committee amended the agreement its four weeks' work would be "scrapped" and it would be necessary to hold the hearings over again. The committee voted the amendment in, then moved to reconsider, and ended by voting out the resolution unamended.

Under the provisions of the resolution the Capital Transit Company, the new company, would acquire properties and stocks or securities and succeed to the powers and obligations of the Capital Traction Company and the powers and obligations of the Washington Railway & Electric Company directly connected with, or relating to, the operation of electric railways, buses and other forms of public transportation.

Provisions of the law making it incumbent upon the railways to bear the expense of crossing policemen, the laying of new pavement, the making of permanent improvements, renewals, or repair to streets and bridges over which street cars operate would be repealed. The Capital Transit Company, however, would be called upon to bear the entire cost of paving repairs, etc., incident to track repairs, etc., and one-fourth of the cost of paving, repaving and maintenance of paving between tracks and for 2 ft. outside the outer rails, and the excess cost of public bridges due to the existence of tracks thereon.

The agreement provides that a valuation of $50,000,000 be placed upon the properties of rate-making purposes.

Traffic, Fare and Wage Figures

The number of revenue passengers, including bus passengers, reported by 210 companies to the American Electric Railway Association for March, 1928, compared with March, 1927, is as follows:

March, 1928	850,090,214
March, 1927	862,218,344
Decrease, per cent	1.41

The rate of decrease is smaller than has been reported in recent months and indicates that traffic conditions are improving.

Average cash fares in cities of 25,000 population and over were:

	Cents
April 1, 1928	8.1186
March 1, 1928	8.1186
April 1, 1927	7.9403

There was no change in the average basic fare in American cities during the month of March.

The average maximum hourly rates paid motormen and conductors in two-man service by companies operating 100 or more miles of single track:

Month	Average Rate Cents	Index Number 1913=100 Per Cent
April 1, 1928	57.38	210.57
March 1, 1928	57.38	210.57
April 1, 1927	56.97	209.06

No changes in wages were reported during March.

Suit to Sell Ohio Interurban Right-of-Way

Suit to sell the right-of-way of the old Cincinnati, Milford & Loveland Traction Company in Madeira, Ohio, has been filed in the Common Pleas Court at Cincinnati. The action was brought for alleged non-payment of taxes on the right-of-way.

Increase in Net Income on Brooklyn System

For the nine months ended March 31, 1928, the total operating revenues of the Brooklyn-Manhattan Transit System, Brooklyn, N. Y., were $35,404,376 against $34,732,911 for a similar period last year. Operating expenses increased from $22,477,848 to $22,906,048 in the 1928 period. After the consideration of income deductions, the net income for this year's period was $4,764,700 compared with $4,686,588 last year.

Massachusetts Line Being Scrapped

The lines of the New Bedford & Onset Street Railway, New Bedford, Mass., are being scrapped. The property was sold in the summer of 1927 and ceased operations Sept. 30, 1927. At the time of the sale it was stated that the new owners, whose identity was not revealed, had planned to continue operation of the line.

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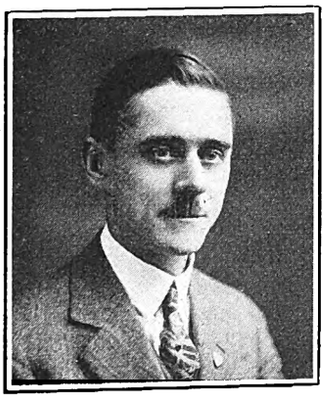
Personal Items

H. H. George in Cleveland

Official long connected with New Jersey company accepts new post of superintendent of research in Ohio city

HOWARD H. GEORGE, assistant to the chief engineer of the Public Service Production Company, Newark, N. J., has been appointed superintendent of research of the Cleveland Railway, and has taken up his new duties with that company. Mr. George is well known in the industry, particularly among engineers. For years he has been active in American Electric Railway Engineering Association work, and for the past five years has served as chairman of the committee on way and structures. He has represented the American Electric Railway Association



H. H. George

sectional committee on tie specifications of the American Engineering Standards Committee, and also that on specifications for special trackwork materials. Until the time of his transfer from the Public Service Railway of New Jersey to the Public Service Production Company, an affiliated company, he was one of the representatives of the American Society of Civil Engineers on the welded rail joint committee. He is also a member of the committee of judges of the ELECTRIC RAILWAY JOURNAL'S maintenance contest and of the A.E.R.E.A. rules revision committee.

Mr. George began his career in the electric railway industry in 1906 with the Public Service Railway. Thereafter until June, 1925, he served that company successively as field engineer, division engineer, assistant to chief engineer and engineer of maintenance of way. In this capacity he was in charge of all engineering and supervision on new construction on bridges, buildings, track and ferries. In 1925 he was transferred to the Public Service Production Company, the construction subsidiary of the Public Service Corporation. The first year he served as superintendent of commercial construction, but for the last two years he has held the position of assistant to the chief engineer, in responsible charge of several large construction projects, among them the construction of the Federal Trust Building and the East Park Street extension to the Newark Terminal Building, and Route 1 extension, Section 2 of the New Jersey State Highway in Jersey City, N. J.

During the World War Mr. George served as a first lieutenant and as captain in the Engineer Corps, first with the 305th Engineers, 80th Division, and later with the 55th Engineers, during which latter service he was engineer officer in charge of building construction on the Chateaureaux storage depot project. Just prior to the signing of the armistice, he was transferred to Base Section No. 4 at Havre as engineer officer in charge of railroad construction.

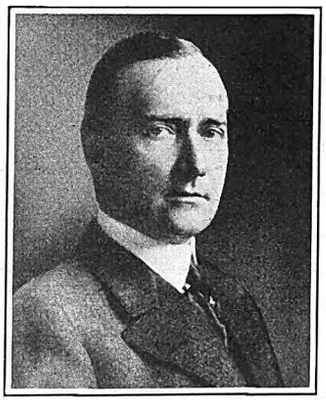
A. L. Drum to Head Detroit United Successor

A. L. Drum, who has been operating manager of the properties of the Detroit United Railway, Detroit, Mich., for the past three years under the receivership of the U. S. District Court, will be president of the new successor company under the reorganization, to be known as the Eastern Michigan Railways, to be formed to operate the rail and bus properties. It is planned to turn over the property to the new company about Aug. 1. The foreclosure sale will, it is stated, be made to discharge the lien of the bondholders, and will provide for the claims which are found by the court to rank prior to the bondholders' lien.

Ample provision will be made for working capital and financial credit to enable the new company to acquire new cars, extend track and secure additional buses to serve the traveling public in the greater Detroit metropolitan district. This includes the interurban rail and bus service to Toledo, Port Huron, Pontiac, Flint, Lansing and Grand Rapids, and the local railway and city bus systems in Pontiac and Flint.

Mr. Drum as manager and receiver and his representatives have applied themselves intensively to the problems of the Detroit United since their entrance into the situation there. And they have built constructively and well. The plan they have laid out gives promise for the future, since it is based not only on the wide experience of Mr. Drum in his general practice as consultant but on the experience had with this particular property.

To the work on the Detroit United Mr. Drum brought a splendid knowledge of engineering and management built up over a long period of years. More recently he has been engaged as a consultant in business for himself as head of A. L. Drum & Company, but his entrance into electric railway work dates back to the period following immediately after he was graduated from the Massachusetts Institute of Technology. His first work was in the power station of the Boston Electric Light Company. Later he engaged for a time in journalism, but his real flair was for engineering and so he returned to the utility field as manager of the Middleboro gas and electric plant in Middleboro, Mass. But the Middle West beckoned and Mr. Drum became general manager and construction engineer for the Indiana Union Traction Company. Then followed a succession of important posts too numerous to mention, but among them the position of general manager and construction engineer for the Chicago & Milwaukee Electric Railroad, which ultimately led to the formation of A. L. Drum & Company with offices at Chicago, and the participation of that firm and of Mr. Drum as experts in some of the most important construction and engineering projects carried out in recent years in the United



A. L. Drum

States, many of which connections contemplated the retention of the firm in valuation cases and other similar proceedings in which expert engineering, financial and management knowledge was a requisite.

R. H. Wyatt Made Officer of Louisville & Interurban

Richard H. Wyatt, who has served as acting manager of the company since 1925, has been elected vice-president and general manager of the Louisville & Interurban Company, a subsidiary of the Louisville Railway, Louisville, Ky.

The office is a newly created executive position, according to the announcement, and it was desired to have an executive in direct charge of the road's operations. Samuel Riddle and Frank H. Miller, vice-presidents of the Louisville Railway, served in a similar capacity for the interurban until their terms expired in February. Mr. Riddle is now secretary of the interurban.

Mr. Wyatt entered the service of the Louisville Railway as a boy 45 years ago, and has held many positions since that time. When the interurban system

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was started in 1904 he was appointed general express agent and, after a few years, general freight and passenger agent. He was promoted to the office of general superintendent in 1921, and to his recent place of acting manager in 1925.

Obituary

Raymond B. Keating

Raymond B. Keating died on May 12 at the West Penn Hospital after a brief illness. He was vice-president of the West Penn Electric Company, West Penn Railways, and the West Penn Power Company, as well as their subsidiaries, including the Wheeling Traction Company. He was also a director and vice-president of the Monongahela-West Penn Public Service Company of Fairmont, W. Va.

In 1907 he became assistant secretary of the Electric Properties Company, New York. Subsequently he was made secretary, treasurer and director of the Lackawanna & Wyoming Valley Railroad and its subsidiaries. He served in these capacities throughout the reorganization of the group of companies and the formation of the Scranton & Wilkes Barre Traction Corporation. Concurrently he was secretary and treasurer of the Electric Powers Security, Niagara Falls. N. Y. During this period he served as secretary and treasurer of the Merchants & Manufacturers Exchange, New York City.

In 1914 Mr. Keating became vice-president of the West Penn System at its New York offices and in August, 1915, returned to Pittsburgh to continue his active duties with this company.

Mr. Keating began his business career about 1900, being connected with public utility concerns affiliated with the Philadelphia Company.

JOHN CONNOR, familiarly termed "Johnny" throughout the organization of the Philadelphia Rapid Transit Company and pretty broadly in the city of Philadelphia itself, died on May 11. At the time of his death he was traffic manager of the Yellow Cab Company, now under the control of the Philadelphia Rapid Transit Company. Mr. Connor started life in the coal regions and went to Philadelphia when a youngster to become a messenger boy. He joined the Quaker City Cab Company in 1909 as a telephone operator. Six years ago he became identified with the Yellow Cab Company.

J. H. MCWHORTER, brother of A. D. McWhorter, general superintendent of the Memphis Street Railway, Memphis, Tenn., died on April 29. He had been connected with the Galena Signal Oil Company, Atlanta office, as lubricating engineer for the past ten years. Previous to that time, he was in the mechanical department of the Georgia Power Company. Mr. McWhorter had many friends in the railway industry. He leaves a widow.

Manufactures *and the* Markets

Boston, Revere Beach & Lynn Electrifies

Complete electrification is now in progress on the Boston, Revere Beach & Lynn Railroad. Complete plans for the electrification and how it is being financed were published in ELECTRIC RAILWAY JOURNAL on December 10, 1927. Electric equipment for the change-over will be furnished by the General Electric Company. Sixty-two two-motor equipments will be installed on the passenger cars, and four-motor equipments will drive the work cars.

Each of the passenger car equipments will consist of two 60-hp., 600-volt motors with light-weight multiple control. Each work car will be equipped with four motors of the same type but with platform type control. Electric headlights will be used on all cars. Air brake equipment will be of the double-end, electro-pneumatic type. The electric equipment will be installed on the present coaches and the work will be done in the railroad's shops. Meanwhile, the use of electricity will be extended to the waiting rooms where electric turnstiles will be placed in service without waiting for electric train operation.

Two of the electric substations will be fully automatic, one containing a 1,000-kw. synchronous converter and the other, two synchronous converters of the same size. The third substation will be of the portable type, carrying a 1,000-kw. manually-controlled converter. Power will be purchased from local power companies and distribution will be made over a 600-volt catenary line. Simple, direct suspension will be used in the yards and sidings. Under the direction of the engineering and management organization of Hemple & Wells, numerous other improvements will be made, including the remodeling of the stations and the modernization of all equipment.

Largest Portable Substation for Brazil

Designs have been completed on the world's largest portable railway substation, which is being constructed by the Westinghouse Electric and Manufacturing Company for the Paulista Railroad, Brazil. This station will be used on the 150-mile electrified line between Jundiahy and Rancao. When completed, the station will include two cars with a total weight of approximately 150 tons and its capacity will be 2,000 kw. It will draw power at 88,000 volts from a transmission line and will supply 3,000 volts direct current to the trolley wire.

New Equipment for Indianapolis & Cincinnati Traction

Reorganization plans providing for the separation of the Indianapolis & Cincinnati Traction Company into two corporations, one devoted to transportation and the other to light and power distribution, have been announced by Charles T. DeHore, Cincinnati, and Teroy E. Eastman, Toledo, who bought the property at receiver's sale in Rushville.

The Shelbyville-Greensburg and the Rushville-Connersville lines will be known as the Indianapolis & Southeastern Railway, while the light and power business will be incorporated as the Southeastern Indiana Power Company.

The new operators plan an outlay of $250,000 for freight cars, station facilities, motor stock cars, stock pens, improvement of high-tension lines and extension of light and power business. Twelve freight trailers will be purchased in addition to a like number now in operation, and freight motors will be increased from four to six.

Good Year for Westinghouse—Bookings Off Slightly

The Westinghouse Electric & Manufacturing Company, Pittsburgh, Pa., reports for the year ended March 31, 1928, consolidated net income of $15,639,172 after depreciation, taxes and interest, equivalent to $6.59 a share on the 2,370,063 combined preferred and common shares ($50 par). This compares with $16,138,441, or $6.81 a share on the combined preferred and common shares in the preceding fiscal year. The reduced volume of new business offering during the year, as compared with the

Exhibitograph No. 9

EXTRA!

Space for A.E.R.A. Show Assigned

The goal set by the Exhibit Committee has been reached.

At its meeting on May 16 the committee assigned 99,170 sq.ft. space to 175 exhibitors.

With four months still to go and with new applications arriving all summer, the exhibit feature of the convention promises to be

BIGGER AND BETTER

than ever before.

There is still desirable space available. If you wish to show this year, Mr. Manufacturer, don't delay your application. Get in touch with A.E.R.A. Headquarters, 292 Madison Avenue, New York City.

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preceding year, and reduced sales prices for many products, are reflected in the reduction in sales billed. These two factors contributed to reduce the net manufacturing profit for the year. The value of unfilled orders at the close of the year, after adjustments, was $47,742,204 compared with $55,298,890 at the close of the preceding year. During the year inventories were reduced $11,072,535. Expenditures for new plants and for additions and extensions to existing plants during the past six years aggregate $39,715,000.

The consolidated income account of the company and proprietary companies compares as follows:

	1928	1927
Sales billed	$175,456,815	$185,543,087
*Cost of sales	161,347,357	169,764,086
Net manufacturing profit	$14,109,459	$15,779,001
Other income	3,031,704	2,585,614
Gross income	$17,141,163	$18,364,615
Interest charges	1,501,991	2,226,174
Net income	$15,639,172	$16,138,441
Preferred dividends	319,896	319,896
Common dividends	9,156,152	9,156,952
Surplus	$6,163,124	$6,662,588
Previous surplus	$54,161,834	51,715,396
Total surplus	$60,324,958	$58,377,985
Miscellaneous credits	.....	.....
Additional reserves for federal tax, 1917-21	.....	.....
Pittsburgh Meter surplus, May 19, 1926	.....	786,247
†Premiums and discounts	.....	2,787,786
Miscellaneous debits	.....	642,118
‡Reserve for possible adjustment, book value	1,770,975	.....
Patents, charters, franchises, etc., written down to nominal value	4,621,784	.....
Add balance of reserve previously appropriated for federal tax not required	3,000,000	.....
Final surplus	$56,932,198	$54,161,834

*Factory cost, including depreciation of property and plant and all distributions, administration and general expenses and taxes.

†In connection with redemption of 7 per cent and 6 per cent bonds of Westinghouse Machine Company and issue of new 5 per cent bonds.

‡Of investments in affiliated companies, for pensions, and for notes and accounts receivable and miscellaneous charges, less profit realized on the same of certain investments.

Standard Coal Contract Perfected

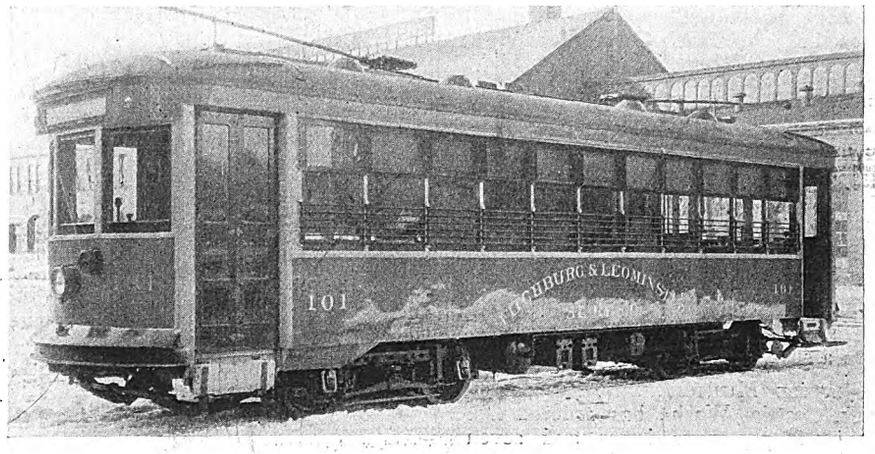
As a result of a recent joint meeting of representatives of the National Association of Purchasing Agents and the National Coal Association, buyers and sellers of coal will shortly be able to use a standard contract form that should prove mutually satisfactory. The new form is a revision of the standard coal contract form developed by the National Association of Purchasing Agents and which had been in use for some time.

Truscon Buys Hydraulic Pressed Steel

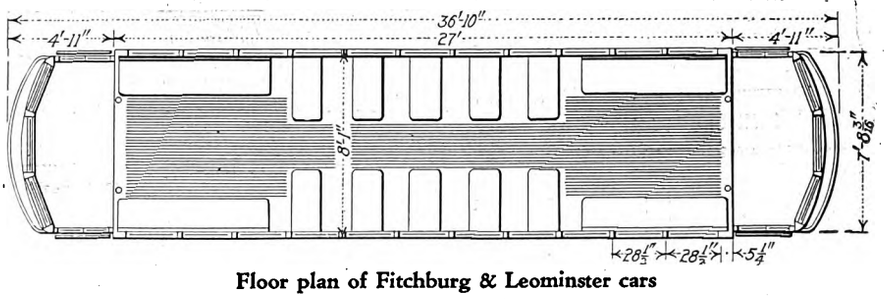
Hydraulic Pressed Steel Company, Cleveland, Ohio, has been purchased by the Truscon Steel Company, Youngstown, Ohio, and will be operated as its pressed steel division. The entire plant is being completely modernized, giving the Truscon Steel Company one of the largest capacities for furnishing pressed and deep drawn steel of every description. Full productive capacity will be available shortly.

Two Cars for Fitchburg & Leominster

Recently two interurban, one-man, two-man cars were delivered to the Fitchburg & Leominster Street Railway, Fitchburg, Mass., from the Wason Manufacturing Company, Springfield, Mass. These cars are duplicates of the four furnished by the same company in April, 1927. The length of the cars is 36 ft. 10 in. and the width is 8 ft. 2⅜ in. They are of the semi-steel construction with arch roofs and end doors. There are seats for 44 passengers in each car. Complete specifications are given in the table below.



One of the Fitchburg & Leominster Street Railway cars recently completed by Wason Manufacturing Company



Floor plan of Fitchburg & Leominster cars

Type of unit	One-man, two-man; motor; passenger; interurban; double end; double truck
Number of seats	44
Builder of car body	Wason Mfg. Co., Springfield, Mass.
Date of order	12-27
Date of delivery	3-28
Bolster centers	17 ft. 8 in.
Length over all	36 ft. 10 in.
Length over body posts	27 ft. 0 in.
Truck wheelbase	5 ft. 4 in.
Width over all	8 ft. 2 ⅛ in.
Window post spacing	28½ in.
Body	Semi-steel
Roof	Arch, canvas-covered
Doors	End, folding, hand operated
Air brakes	General Electric
Axles	A.E.R.E.A. standard
Car signal system	Faraday high voltage
Compressors	CP-27-B
Conduit	Flexible metal
Control	K-35-KK, double end
Couplers	Metropolitan
Curtain Fixtures	Curtain Supply Co.
Curtain material	Double-faced Fabrikoid
Destination signs	Hunter illuminated
Fare boxes	Railway's standard
Floor covering	Wood mat
Glass	DTA
Hand brakes	Peacock
Hand straps	Buffalo light metal
Heaters	Gold Car Heating & Lighting Co.
Headlights	Golden Glow RM-96
Headlining	¼-in. Agasote
Interior trim	Statuary bronze
Journal bearings	Plain
Journal boxes	Brill
Lamp fixtures	Electric Service Supplies Co.
Motors	Four GE-265A, inside hung
Registers	Railway's standard
Sash fixtures	J. L. Howard
Seats	Brill 201-B reversible
Seat spacing	2 ft. 4½ in.
Seating material	Genuine brown Spanish leather
Steps	Folding
Step treads	Kass safety
Trolley catchers	Ohio Brass
Trolley base	US-20
Trucks	Brill 177-EI-X
Ventilators	Brill exhaust
Wheels	Rolled steel, 27 in. diameter

ROLLING STOCK

DETROIT DEPARTMENT OF STREET RAILWAYS, Detroit, Mich., has received one urban Twin Coach.

WASHINGTON RAILWAY & ELECTRIC COMPANY, Washington, D. C., has obtained permission from the Utility Commission of the District of Columbia to purchase five new X type motor buses from the Yellow Coach Manufacturing Company.

LINCOLN TRACTION COMPANY, a subsidiary of the Lincoln Gas & Electric Light Company, Lincoln, Neb., has accepted delivery of three Mack four-cylinder city type buses of 29-passenger capacity.

COMMUNITY TRACTION COMPANY, Toledo, Ohio, is submitting to the City Council on May 21, a plan which will permit the company to purchase 100 to 125 additional motor coaches. If the plan is approved it will also give the company a practical monopoly of both bus and street railway service.

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CHICAGO & JOLIET ELECTRIC RAILWAY, Joliet, Ill., has added a Mack four-cylinder 25-passenger city type bus to its fleet.

PITTSBURGH MOTOR COACH COMPANY, Pittsburgh, Pa., has received seven suburban express model Twin Coaches.

LOS ANGELES RAILWAY, Los Angeles, Cal., has received four mechanical drive urban coaches and one parlor coach from the Twin Coach Corporation.

SPRINGFIELD STREET RAILWAY, Springfield, Mass., has ordered six new Yellow buses, 33-passenger capacity, to be used on the Springfield-Palmer line and on the Bircham Bend line. The trolley service on these two lines will be abandoned just as soon as the new buses are delivered.

LEHIGH VALLEY TRANSIT COMPANY, Allentown, Pa., has received one Mack six-cylinder 29-passenger bus equipped with a special body.

SEATTLE MUNICIPAL STREET RAILWAY, Seattle, Wash., has ordered five Mack, 29-passenger buses and seven Studebaker, 21-passenger buses.

ELECTRIC RAILWAY MATERIAL PRICES—MAY 15, 1928

Metals—New York

Copper, electrolytic, cents per lb	14.1625
Lead, cents per lb	6.10
Nickel, cents per lb	35.00
Zinc, cents per lb	6.40
Tin, Straits, cents per lb	52.625
Aluminum, 98 or 99 per cent, cents per lb	23.90
Babbitt metal, warehouse, cents per lb.:	
Commercial grade	53.00
General service	31.50

Bituminous Coal

Smokeless Mine Run, f.o.b. vessel, Hampton Roads, gross tons	4.175
Somerset mine run, f.o.b. mines, net tons	1.875
Pittsburgh mine run, Pittsburgh, net tons	1.825
Franklin, Ill., screenings, Chicago	1.65
Central, Ill., screenings, Chicago	1.575
Kansas screenings, Kansas City	2.50

Track Materials—Pittsburgh

Standard steel rails, gross ton	$43.00
Railroad spikes, drive, ⅝ in. and larger, cents per lb	2.80
Tie plates (flat type), cents per lb	2.15
Angle bars, cents per lb	2.75
Rail bolts and nuts, cents per lb	3.90
Steel bars, cents per lb	1.875
Ties, white oak, Chicago, 6 in.x8 in.x8 ft	$1.10

Hardware—Pittsburgh

Wire nails, base per keg	2.65
Sheet iron (24 gage), cents per lb	2.825
Sheet iron, galvanized (24 gage), cents per lb.	3.625
Galvanized barbed wire, cents per lb	3.35
Galvanized wire, ordinary, cents per lb	3.10

Waste—New York

Waste, wool, cents per lb	16–20
Waste, cotton (100 lb. bale), cents per lb.:	
White	16–19.50
Colored	11-16

Paints, Putty and Glass—New York

Linseed oil (5 bbl. lots), cents per lb	10.7
White lead in oil (100 lb. keg), cents per lb.	13.75
Turpentine (bbl. lots), per gal	$0.575
Putty, 100 lb. tins, cents per lb	5.50

Wire—New York

Copper wire, cents per lb	16.125
Rubber-covered wire, No. 14, per 1,000 ft.	5.40
Weatherproof wire base, cents per lb	16.75

Paving Materials

Paving stone, granite, 5 in., f.o.b. New York—Grade 1, per thousand	$150
Wood block paving 3½, 16 lb. treatment, N. Y., per sq.yd., f.o.b.	$2.70
Paving brick 3½x8½x4, N. Y., per 1,000 in carload lots, f.o.b.	51.00
Paving brick 3x8½x4, N. Y., per 1,000 in carload lots, f.o.b.	45.00
Crushed stone, ¾-in., carload lots, N. Y., per cu.yd., delivered	3.375
Cement, Chicago consumers' net prices, without bags, f.o.b.	2.05
Gravel, ¾-in., cu.yd., delivered	3.375
Sand, cu.yd., delivered	.125

Old Metals—New York and Chicago

Heavy copper, cents per lb	11.875
Light copper, cents per lb	10.375
Heavy yellow brass, cents per lb	7.125
Zinc, old scrap, cents per lb	3.25
Lead, cents per lb. (heavy)	4.875
Steel car axles, Chicago, net ton	$16.25
Cast iron car wheels, Chicago, gross ton	13.75
Rails (short), Chicago, gross ton	15.25
Rails (relaying), Chicago, gross ton (65 lb. and heavier)	27.50
Machine turnings, Chicago, gross ton	7.25

TRACK AND LINE

SPOKANE UNITED RAILWAYS, Spokane, Wash., will rebuild 1,000 ft. of track on East Third Street for the East Fifth Street line. The north end of the Astor line will also be replaced. The railway has under consideration the proposed paving of Seventeenth Street, Rockwood to Ray, where its Lincoln Park line is affected. The company is still obtaining estimates of cost to see if the job can be included in this year's work.

OREGON ELECTRIC RAILWAY, Portland, Ore., will soon take bids to build 68½ miles of track between Albany and Milwaukee, Ore., at an approximate cost of $1,000,000.

READING TRANSIT COMPANY, Reading, Pa., is completely rebuilding 1,350 ft. of double track on Carsonia Avenue in the borough of Mount Penn. Aside from the installation of new rails and ties, the poles will be moved from the center of the avenue to the curb and the entire street area will be covered with a bituminous-bound macadam.

SHOPS AND BUILDINGS

COLUMBUS ELECTRIC & POWER COMPANY, Columbus, Ga., plans a 40,000-hp. hydro-electric project on the Chattahoochee River. The cost will be $700,000.

BOSTON ELEVATED RAILWAY, Boston, Mass., plans a substation on Warren Street to cost approximately $40,000.

BOSTON & MAINE RAILROAD, Boston, Mass., will make improvements in its car repair shops at Keene, N. H., to cost about $175,000.

WISCONSIN POWER & LIGHT COMPANY, Madison, Wis., plans a power plant to cost $250,000.

TRADE NOTES

NATIONAL BRONZE COMPANY, Montreal, Canada, has been purchased outright by the Robert Mitchell Company, Montreal. The purchase involves no new financing for the Robert Mitchell Company.

HASKELITE MANUFACTURING CORPORATION, recently moved to larger quarters at 120 South LaSalle Street, Chicago, Ill. Its new offices are now on the same floor as the Vitrolite Company, and other Meyercord interests.

WESTERN RED CEDAR ASSOCIATION, Minneapolis, Minn., has appointed John P. Wentling director of its research division. His wide experience and extensive training will be available to all users of wood poles. As incoming director of the research division, he urges pole users to avail themselves of the services of this division in helping to work out any of their pole problems.

CELORON COMPANY, Bridgeport, Pa., announces the appointment of R. W. Wales as factory representative on molding powders and resins.

LINDE AIR PRODUCTS COMPANY, New York, N. Y., has opened a district sales office at 48 West McLemore Avenue in Memphis, Tenn. H. N. Smith will be district manager in charge.

NATIONAL INDUSTRIAL ADVERTISERS' ASSOCIATION will hold its annual conference at the Hotel Chase, St. Louis, Mo., on June 11, 12 and 13.

ANCHOR POST FENCE COMPANY, Baltimore, Md., has elected W. F. Brannon president, succeeding the late Herbert G. Thomson.

GENERAL ELECTRIC COMPANY, Schenectady, N. Y., has elected as a director Henry C. McEldowney, president of the Union Savings Bank and the Union Trust Company, Pittsburgh, Pa.

INTERNATIONAL GENERAL ELECTRIC COMPANY has elected as vice-presidents, R. Arthur Baldwin, European manager, and Otto Pruessman, vice-president of the Tokio Electric Company, Tokio, Japan.

ADVERTISING LITERATURE

WESTINGHOUSE ELECTRIC & MANUFACTURING COMPANY has issued a folder on the subject "A 'Tool' of Modern Railroad Efficiency," which elaborates on the advantages of gas-electric car equipment and goes into considerable detail on the latest achievement in this field—the Westinghouse torque governor control which is a successful means for utilizing the full power of the engine at all speeds. Complete details on this may be found in D.M.F.-5073.

TRICO FUSE MANUFACTURING COMPANY, Milwaukee, Wis., has announced bulletin 206-B describing Trico powder-packed renewable fuses. It contains data and tests on overload time-lag and watt-loss saving.

MARTINDALE ELECTRIC COMPANY, Cleveland, Ohio, has issued a folder announcing a 27 per cent average price reduction on commutator stones.

OHIO BRASS COMPANY, Mansfield, Ohio, has published a 33-page supplement Number 1 to catalog Number 20. It includes the listings of all new O-B devices brought out since the issuing of Catalog 20.

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A Big Success in Little Rock

1927 was the most successful year in the history of the Arkansas Power and Light Company, Little Rock, Arkansas.

As reported in the *Electric Railway Journal,* May 5, the very favorable net profits which accrued were attributed to their modernization program, started with the purchase of eight double-truck cars built by the American Car Company and followed by thirty single-truck cars purchased from the same company in 1926.

Increased speed, lower maintenance and added comfort are factors in which these Brill Modern Cars are performing an important part.

The attractive earnings in Little Rock are typical of the profit producing possibilities of Brill Modern Cars as successful competitors of the family automobile.

Write for the Brill Car Catalog and learn the "what," "how" and "why" of modern cars.

THE J. G. BRILL COMPANY
PHILADELPHIA, PA.

AMERICAN CAR CO. ST. LOUIS MO. — G.C. KUHLMAN CAR CO. CLEVELAND, OHIO. — WASON MANF'G CO. SPRINGFIELD, MASS.

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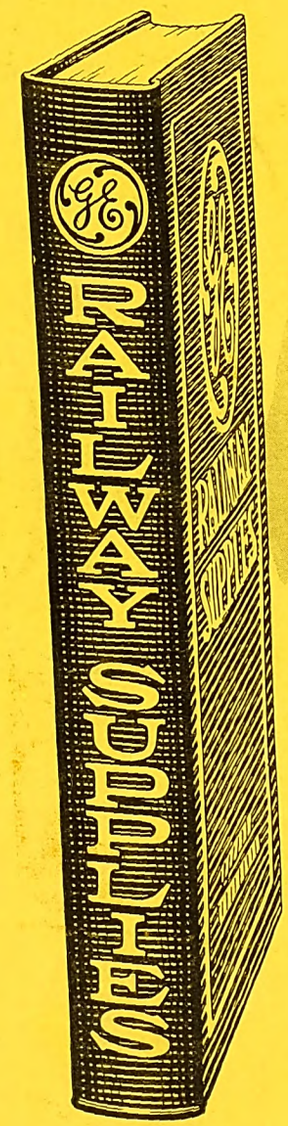

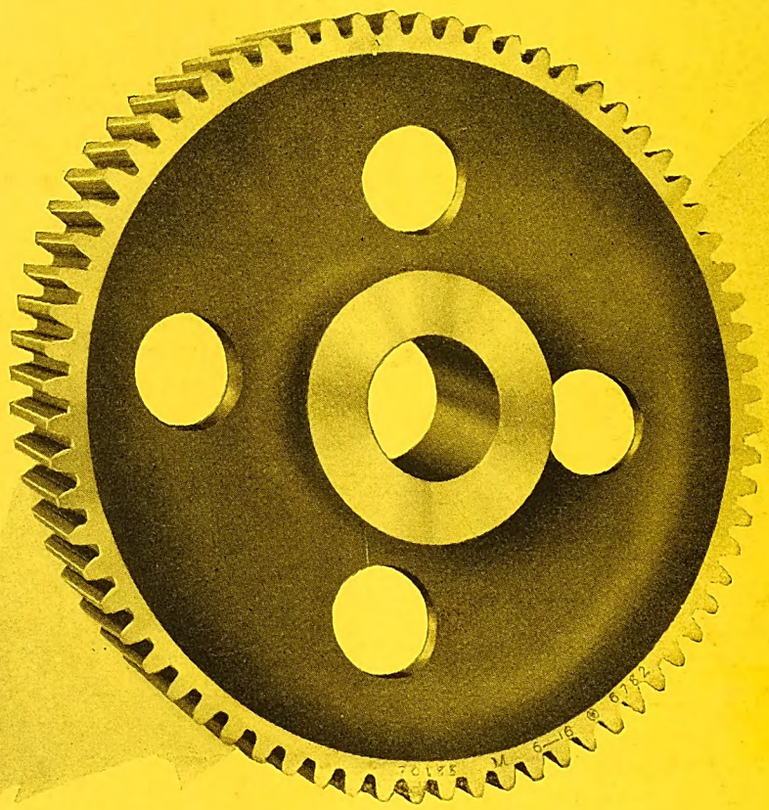

1925--G-E Gears Installed
1926--G-E Gears Standard
1927--G-E Gears Standard

The Chicago Surface Lines chose G-E improved Grade M gears and pinions for a large part of its 1925 requirements. As a result, G-E gearing was specified for all 1926 requirements, and now in 1928, General Electric gearing continues to be the standard.

Gears and pinions which thus meet the rigorous, rapid-acceleration demands of service in Chicago have proved their worth.

Make sure that your gearing bears this mark. The unsurpassed research facilities of General Electric, together with its manufacturing and testing resources, assure a product of lasting dependability.

Use your G-E Railway Supplies Catalog to simplify your buying

330-59

GENERAL ELECTRIC

GENERAL ELECTRIC COMPANY, SCHENECTADY, N. Y., SALES OFFICES IN PRINCIPAL CITIES

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ELECTRIC RAILWAY JOURNAL

Graw-Hill Publishing Company, Inc. MAY 26, 1928 Twenty Cents Per Copy

Timken Thrust-Radial Capacity for Armatures

Reduced friction in armature bearings is *highly desirable*. But extreme endurance is *absolutely indispensable*. BOTH can be had in Timken-equipped railway motors, because Timkens are the anti-friction bearings which provide greater load carrying area, full thrust-radial capacity, highest shock resistance, and positive closure.

Wear in all its forms is balked by Timken Bearings with their exclusive combination of Timken tapered construction, Timken *POSITIVELY ALIGNED ROLLS*, and Timken-made electric steel. Timken-mounted armatures remain perfectly centered, free from the risk of abrasion and burn-out. Maintenance is reduced to a matter of lubricating only a few times yearly!

Timken Bearings in both railway motors and journals are a direct step toward economical, smooth, continuous on-schedule operation. Get the data from Timken or motor manufacturers.

THE TIMKEN ROLLER BEARING COMPANY, CANTON, OHIO

TIMKEN *Tapered Roller* BEARINGS

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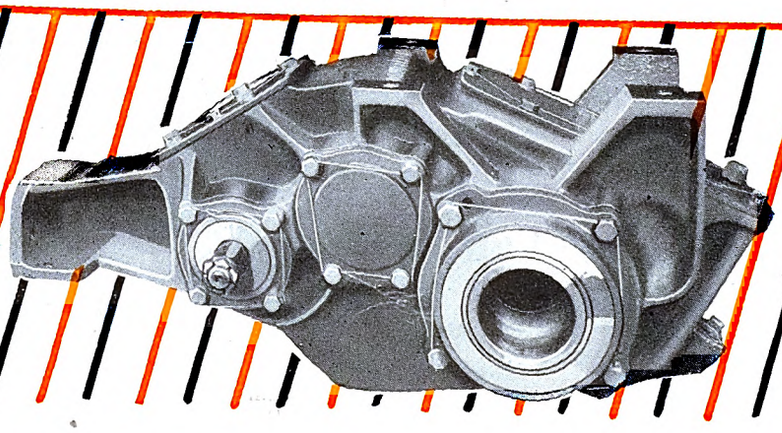
Another big improvement in Electric Car Drive



The New W-N Drive

Back in the early days most operating men thought that the cast steel spur gear was the last word in car drives— until they tried the Nuttall Helicals.

Now comes another big improvement known as the new W-N Drive, the speed reducer of the traction field, a unit consisting of heat treated helical gears mounted in an oil tight steel case and revolving on Timken Roller Bearings in a continuous bath of oil.

With the W-N Drive you can take full advantage of the efficiency of modern high speed motors, gearing them down without loss, to deliver an even flow of power, with smooth starting, quick acceleration and quiet operation.

The new W-N Drive is economical both in original cost and upkeep as well as in the space that it occupies on the truck. Let us tell you more about this latest development in electric car drive.

R.D. NUTTALL COMPANY
PITTSBURGH PENNSYLVANIA

Canadian Agents:
Lyman Tube & Supply Co., Montreal, Toronto and Vancouver

All Nuttall Products are sold through the Westinghouse Electric & Mfg. Co., district offices. Refer your inquiries to the nearest Westinghouse Office.

Nuttall

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Electric Railway Journal

McGraw-Hill Publishing Co., Inc.
JAMES H. MCGRAW, *President*

Consolidation of
Street Railway Journal and
Electric Railway Review

CHARLES GORDON
Editor

Volume 71 New York, Saturday, May 26, 1928 *Number 21*

Before and After the "Take-Off"

JUST a year ago a glorious flight aroused public consciousness to the possibilities of general travel via the air. Since then that young pioneer whose exploits have fired the imagination of the entire world has repeatedly risked life itself in an effort to make his dreams come true. Now comes the startling expression of faith in his vision contained in the announcement from the Pennsylvania Railroad of its plan for a train-airplane service between New York and Los Angeles.

However fantastic the idea of spending week-ends in Paris may be, passenger airplane service between the Atlantic and Pacific coasts appears a certainty, and with the execution of such comprehensive plans the interurban or bus will have a part to play. Testimony of this fact is seen in the necessity for the purchase by the Detroit Municipal Railway of another bus to maintain its hourly schedule for the accommodation of passengers traveling the route of the Stout Air Services, Inc., on the regularly routed planes between Detroit and Cleveland. For the past year the Department of Street Railways has been supplying a de luxe coach service between the hotel district and the Ford Airport, but the increased volume of traffic incident in part to the recent all-American Aircraft Show and the regular aerial routes over the city emphasize the need that will come for an alliance between local transportation and the flying industry. The developments now being recorded almost daily in aviation are merely harbingers of the much greater things likely to come out of "An Unforgettable Lesson from the Sky."

Space Demands Exceed All Expectations

WHEN the convention exhibit committee met on May 16, it faced the assignment of 102,170 sq.ft. of space for the Cleveland show, Sept. 22 to 28. This demand at so early a date, representing 176 exhibitors, exceeds all expectations, according to Fred C. J. Dell, director of exhibits. The figures are exclusive of track space for car exhibits for which the applications of two manufacturers, and two operating properties, respectively, have been received.

These data are especially encouraging as a reflection of the steady growth which has characterized this phase of the association's work, since conventions were the order of the day. For instance: in nine exhibit years, space requirements have grown from 57,329 sq.ft. in 1916 to 116,634 last year; the number of exhibitors from 125 to 293, respectively.

Co-operation between manufacturers and exhibit committees is, of course, responsible for this growth. This co-operation should be recognized to the fullest extent. Here arises an important phase of the whole situation. The best way the industry can show its appreciation is to see that key men are present to study every exhibit. Last year there was a notable display by the manufacturers of shop tools. Unquestionably what they had to offer was of inestimable benefit to the men who actually use this equipment. The men who saw the exhibit went back to their properties with a new slant on things mechanical. It is hoped that this year their number will be doubled. These are the men who spend maintenance money wisely or unwisely, depending on how well they are informed regarding new devices for increasing efficiency. They should get their information first hand, and the exhibit is one of the best places to get it. What applies to them is equally applicable to men in other branches of the service and to other phases of the exhibit.

Action on Merger Proposal in Washington Postponed

CALMER councils were in evidence in Washington at the close of the public hearings on the plan for merging the local railway and bus companies. True, the Senate District of Columbia committee will appoint a sub-committee to go into the question during the summer, but the proposal now has back of it the prestige of the declaration of the House District of Columbia committee to the effect that "the best interests of the district would be served by the consolidation." Doubt among the legislators appears to center around the valuation proposal, but it would seem that the zealots have been pretty well put to rout who tend to look upon any business proposal of magnitude as a deep and dark conspiracy.

As the Washington *Post* pointed out, no uncontrolled monopoly can be acquired in the national capital. The development of regulatory machinery long ago dissipated that bogey of self-appointed public champions—not only in Washington but in the country generally. In Washington there is a double check. Congress has exclusive legislative jurisdiction over the district. Fares can be regulated by the Public Utilities Commission, subject always to the overruling jurisdiction of Congress and the courts. If the people of Washington should ever be subjected to attempted extortion by any public utility, they could quickly obtain protection. Excessive railway and bus fares would be especially easy to combat.

Some of the technical aspects of the merger have already been the subject of comment in this paper. In the matter of valuation alone, the public stands to gain greatly, since the figure of $50,000,000, proposed as acceptable to the companies, is about $12,000,000 less than might have been secured under "due process of law." There are many other concessions on the part of the companies that make the merger desirable in the

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public interest. Certainly it will pave the way for efficient and reliable service at tne lowest possible fare.

If what the public wants is not good service at reasonable cost, then it would be idle to attempt to define what it wants, for no sensible citizen asks or expects good service at a cost that would not yield the public servant reasonable compensation. It follows obviously that the consolidation of transportation agencies under a single management properly supervised by public agencies will produce better service, particularly where co-ordination of facilities is contemplated. Incidentally, it might be remarked that the contemplated change in name to the Capital Transit Company is in line with other recent changes of the kind intended to convey more clearly the disposition of the electric railways to engage in any and all forms of mass transportation and even in certain classes of individual service as well.

The merger is in line with public convenience and necessity. It is needed now more by the public than by the companies, even though they favor it. The companies concerned having reached an agreement after making generous concessions for the general good under which the public would have benefited materially, it is too bad that further delay is to be encountered by the decision to postpone final action on the matter.

Fancy Retreats Before Fact in Kansas City

OUT of the school of practical experience with buses dating back to the fall of 1925 the Kansas City Railways has evolved a set of maxims which are reflected in the terms of the new bus franchise just granted to the company. Its plea has been heeded that trunk line fares be made 15 cents, based upon the cost of the service rendered. How many other points have been allowed which were made by the company in its recent report to the Council is not plain at this writing, but the facts contained in that document and the principles advocated are of the greatest interest to the industry.

Based on its experience, the company maintained that the bus system as a whole should be self-supporting; that the trunk lines should be routed to give the most direct and the quickest service between the residential and business districts; that feeder service should provide crosstown connections and give transportation to sections remote from existing facilities where the population has grown sufficiently to justify it; that night service, and in some instances non-rush hour service, should not be required on feeder lines; that transportation should be supplied where there is a need for transportation and not for the interests of business centers or real estate developments; that wherever street car facilities exist they should be intensively developed and wasteful duplication not required and that the bus franchise or permit should be kept elastic to meet changing requirements as experience increases.

It was on the very score of the experimental nature of bus operation in Kansas City that the original franchise was limited to three years. Even now the company in its report sees the future in terms so uncertain that it suggested the new operating grant be made for a term not exceeding five years. Not that the company has any doubts about the bus. Far from it. But it does recognize from experience that trunk line service providing a seat for every passenger in buses equipped with pneumatic tires cannot be rendered for a 10-cent fare except at an actual operating loss. It is conceded that operation over the hilly routes of Kansas City is necessarily more expensive than in flat, level cities. In Kansas City the longest trunk line is 6.6 miles. The longest feeder is 5.48 miles. Each of the other feeders is less than 3 miles, and the shortest only 1.23 miles. There is one express line charging a 25-cent fare, four trunk lines at 10 cents and six feeders at 10 cents. The trunk line service comes nearer to paying operating costs than do the feeder lines.

The Kansas City management has utilized its past experience with buses to determine policies for the future. It now holds most firmly to the idea that losses from bus feeder lines should be met, if possible, from such profits as the trunk lines can earn on a proper basis of fare. It rightly says there is no equity in accommodating the 3 per cent who use the bus service at the expense of the 97 per cent who use the street cars. It is anxious to do full justice by the bus. Were that not so, it would not have made the plea that it be not "strait jacketed" in its use of the bus. The principles which it advocated as the basis for the successful application of buses in city service constitute a bill of rights for that vehicle as it is now constituted. They could hardly have been put more succinctly. That Kansas City's findings support ELECTRIC RAILWAY JOURNAL's contentions regarding the bus is incidental. The truly significant thing is that they indicate that those bus enthusiasts who have been obsessed with the idea of making the automotive vehicle merely a street car on rubber tires and limiting it to street car rates have been standing in the way of really sound development and expansion. Fancy must retreat before fact.

Loose Talk About the New York 7-Cent Fare Case

DECISION of the United States Supreme Court to set a date early in its fall term to hear the New York 7-cent fare case shows the importance with which the court regards this case. The order staying the collection of the increased fare is logical in view of the early day set for trial and the plea of the city that it had no authority to provide a bond to indemnify the company if the increased fare should be held valid.

Politicians are making the most of this stay, which is no indication at all of the opinion of the court as to the merits of the higher fare. They have also made a great many foolish remarks during the past two weeks about the decision of the statutory court in favor of the 7-cent fare. Thus, a New York senator in Congress criticized the view taken by the court of the intent of contract No. 3, and is reported to have said, "It will be a serious thing when the 6,000,000 people of New York refuse to pay the 7-cent fare which the Interborough may attempt to collect as a result of this outrageous decision." In the meantime, many politicians at home have bewailed in public the hardship which 4 cents a day additional fare will cause to the average workingman who has to use the I.R.T. system. All this shows the hysteria produced by long intrusion of politics into transportation affairs in New York.

Those who fear the dire effect on the populace of an increase in fare should realize that there were no riots in Chicago or Philadelphia when the fare went up to 7 cents,

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or in Boston when it was increased to 10, or because of increases in any of the many other American cities where fares have been raised. The public may not welcome increases in living cost, but the more thoughtful in New York will know that this increase is the only practicable way by which they will get more and better rapid transit service. As for the cry about the increase in fare being an undue burden on some deserving wage earners, it is pure political bunkum. Transportation cost is only a small item in the living costs of even the most humble worker, and transportation is the only item which is at pre-war levels in New York. One needs only to observe the number of automobiles that are jammed into every available parking niche around the average industrial plant to realize how freely the "free corn" class of politician has called upon his imagination in conjuring up a picture of social disorder resulting from a fare increase of 4 cents a day.

As to the question of the intent of contract No. 3, it is necessary only to recall the situation in March, 1913. The Interborough was then in a prosperous condition and certainly would not have jeopardized this position if it had thought the contract unremunerative. There is nothing to indicate the city representatives had any different view or knew that a World War was coming within a year or so which would double operating and construction costs. In other words the intent of the contract was very clearly expressed in the statement of the statutory court that "There is no evidence that the Legislature," in the rapid transit act of 1912 under which contract No. 3 was authorized, "intended to burden the city with an exorbitant fare or the company with a non-compensatory rate."

Final grant by the federal courts of a 7-cent fare should be of as much benefit to the city as to the company. It will make immediate service improvements possible and future extensions more probable. On its part, the company might well emphasize these gains which will come to the city from a reasonable fare.

Group Meetings a Constructive Force

WHEN 52 men attend a series of meetings such as that held by the way and structures division of the American Electric Railway Engineering Association in Atlanta recently, it approaches the status of a convention of track men. Instead of holding sessions of the special committees at various times. followed by a meeting of the standing committee of way and structures, as many as possible of these meetings were grouped together in one week.

Everybody who attended was enthusiastic about the plan. That much of interest was added by the entertainment features arranged by the Georgia Railway & Power Company was a matter of comment. These features, however, did not interfere with the attendance at and the interest in the meetings, as may be seen from the report published in this paper on May 19. Discussion of the various subjects was participated in by all of those present, the voting of course being confined to the committee members. It is certain that the concentration of effort not only saved time for the delegates, many of whom are on more than one committee, but resulted in a more logical treatment of the problems involved.

The success of this meeting indicates the possibility of similar meetings of the other divisions of the Engineering Association. If the plan can be worked out to bring together such groups, it would seem that time should be available for discussion of current problems. A plan of this kind has been proposed to the officers of the Association and has been under consideration by the chairmen of the several divisions. An additional proposal is that the members of a division interchange operating cost data and make these records a subject of discussion at one of the divisional meetings.

In this latter respect the plan approaches that of the Association of Equipment Men, Southern Properties. It is significant that the success of this latter body and the unqualified endorsement given it by the officials of these properties, has stimulated the formation of a new group, the Association of Electric Railway Equipment men, Middle Atlantic States, within the past week. There is every reason to believe that such groups, preferably under the leadership of the Engineering Association, can be a great force in improving operating and maintenance practices of electric railways the country over.

Uniform Traffic Ordinance Desirable

VALUABLE suggestions for improvement of traffic regulation are contained in the proposed model municipal traffic ordinance recently prepared by a special committee of the National Conference on Street and Highway Safety. A summary of its provisions was given in an article published in this paper for May 12, page 771. A number of these, which directly affect the operation of street cars and buses, are of particular interest to electric railway men. Moreover, anything which tends to improve general conditions will result in substantial benefit to the transportation companies.

Two desirable advantages may be expected to follow the adoption of this model ordinance. In the first place, wider knowledge of traffic regulations received from greater uniformity will undoubtedly promote better observation of these regulations.

This is a matter of growing importance, because today, more and more people are traveling considerable distances by automobile and passing through towns where they are unfamiliar with traffic rules. If the rules are approximately the same as those to which they are accustomed at home, fewer violations will occur.

In the second place, this model ordinance endeavors to select and apply the best features of more than 100 traffic ordinances studied by the Committee. The recommendation concerning the establishment of safety zones at street car stops, forbidding other vehicles to drive through such zones and discouraging the use of the track area by vehicular traffic, certainly will meet with the approval of railway men. Experience where such regulations are enforced indicates that good results for all traffic will follow from their general adoption.

A draft of the proposed ordinance has been prepared in printed form and is now being distributed by the committee. At present this draft is merely tentative. Comments and suggestions are invited from everyone interested in this suggestion. All suggestions received before June 10 will receive the careful attention of the committe. Such modification as may seem desirable will then be incorporated and the ordinance formally submitted for approval to the National Conference on Street and Highway Safety.

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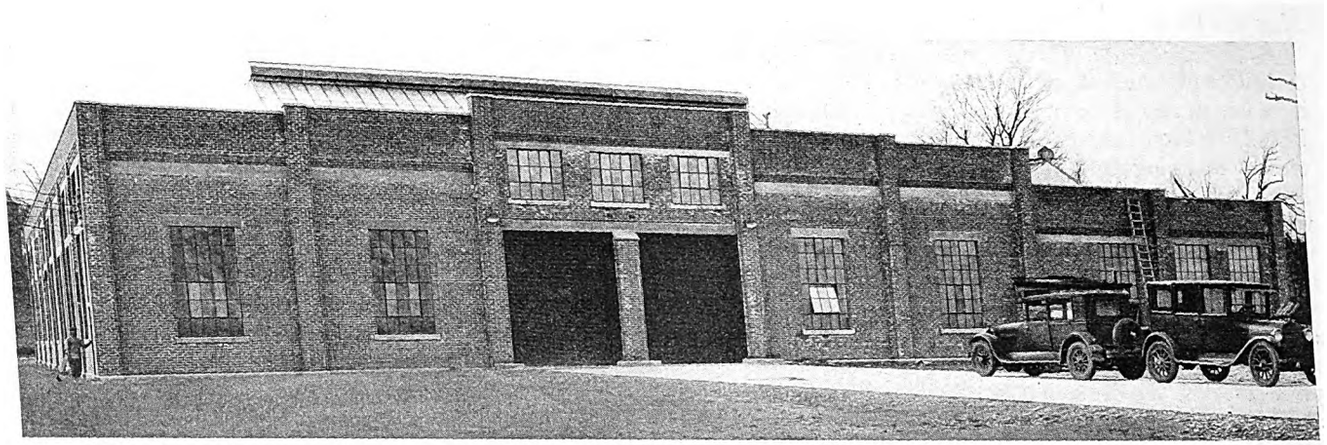


The new Grove Street garage. Space is available to extend the present unit in two directions

Worcester Builds for

Adequate Maintenance

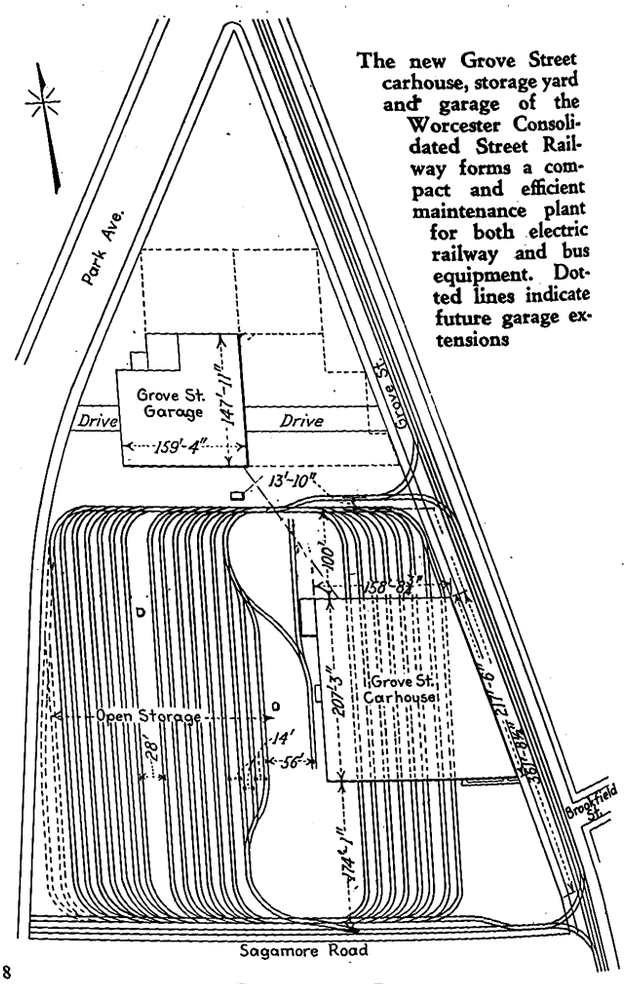
COMPLETION of the Grove Street carhouse and garage in Worcester, Mass., marks another important step in a series of major physical improvements. These make up the rehabilitation program of the Worcester Consolidated Street Railway and the Springfield Street Railway, which have received attention from time to time in the pages of ELECTRIC RAILWAY JOURNAL.

Development of the experimental worm drive car in Springfield, which was described in the March 26, 1927, issue, directed the attention of the entire industry to this pioneering work by a comparatively small propcity. Later, in the Oct. 1, 1927, issue there was an article on the 100 new cars which were subsequently purchased for Springfield and Worcester. More recently, in the April 14, 1928, issue, progress in the rehabilitation of track and other physical property in Springfield was reported. Concurrently with these major rehabilitation steps there were recorded a series of great bonfires to which were relegated the old equipment no longer suited to meet present-day transportation requirements.

NEW BUILDING HAS AMPLE CAPACITY

The Grove Street improvement now provides Worcester with a new carhouse and garage, with ample outdoor storage track and space for garage extensions. By grouping both the carhouse and garage on a single plot, it has been possible to utilize a common heating plant and to avoid duplication of compressed air and other service facilities. The carhouse has capacity for all the cars in the Worcester district and replaces old buildings at Market Street and Gates Lane. Some 203 passenger cars are to be operated from this point. The new garage, with capacity for 50 buses, represents only about one-fourth of the final possible development. Space for extension on the east will provide for 50 more buses, and permissible development on the north will house 75 to 100 additional. There is also room for future extension of the carhouse to the south, which would accommodate sixteen additional cars.

An accompanying illustration shows the general arrangement of the Grove Street plant with carhouse,



The new Grove Street carhouse, storage yard and garage of the Worcester Consolidated Street Railway forms a compact and efficient maintenance plant for both electric railway and bus equipment. Dotted lines indicate future garage extensions

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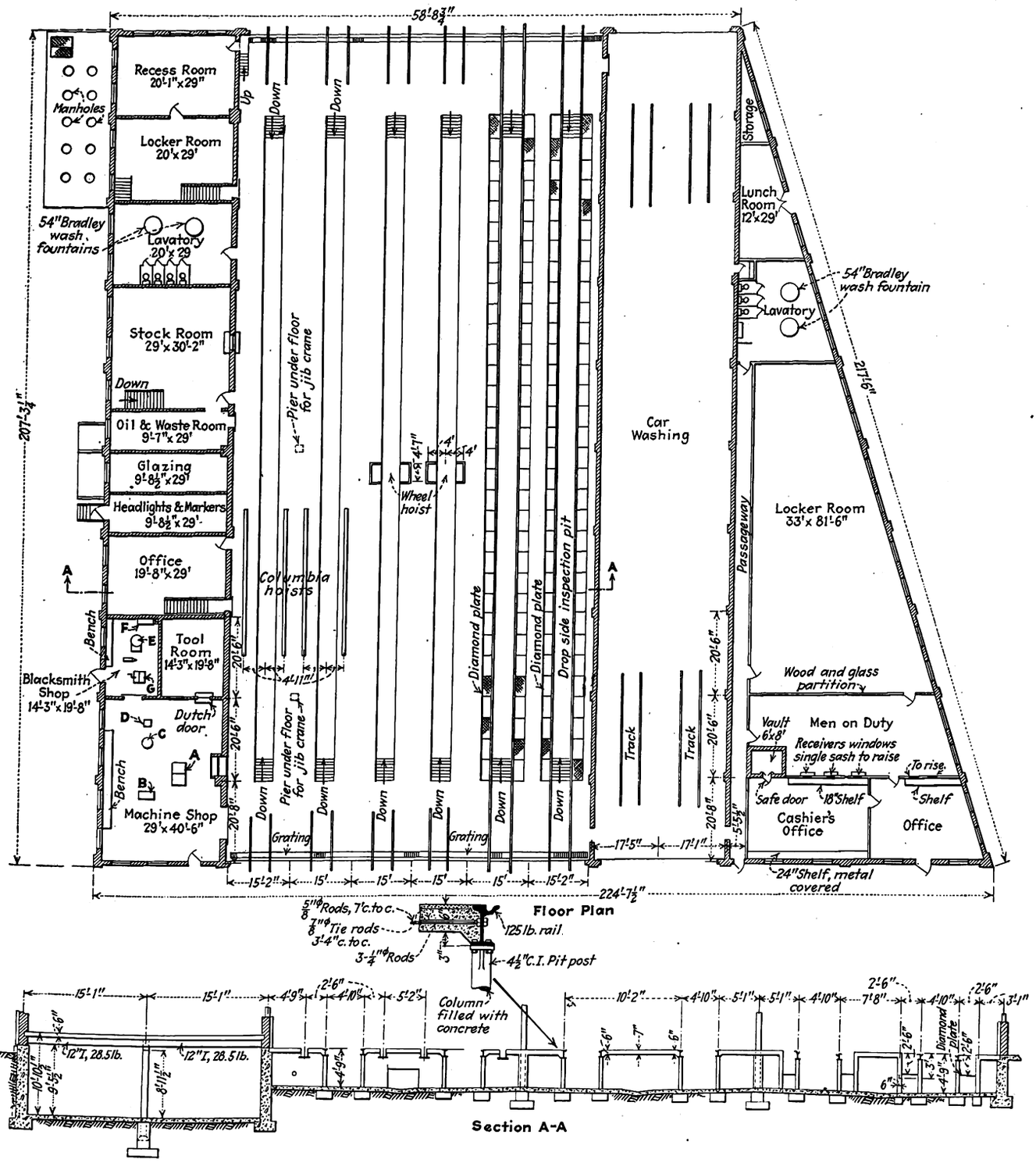
storage yard and garage, and the contemplated extensions. Both buildings are of modern fireproof construction of red brick with artificial stone trim, steel sash, gypsum roof and with very large skylights giving almost ideal natural illumination. The floor area of the garage, 20,000 sq.ft., is the maximum which the state will allow in a class A garage. The trusses have a span of 105 ft., giving an unobstructed floor. Motor-operated, push-button-controlled Kinnear doors are installed in both buildings. Complete sprinkler systems of the "wet" type are provided. Pipes for air at 200 lb. pressure, gas, hot water, cold water and vacuum for cleaning purposes are carried underground between the two buildings, thus concentrating service equipment for these several facilities at one place in the carhouse.

The general arrangement of the carhouse is similar to that of the Hooker Street carhouse in Springfield which was built a number of years ago. The size and shape of the lot permitted a track layout giving convenient storage facilities for a maximum number of cars. The building provides track, shops and pits for inspection and running repairs and a large wash bay. Cars entering on the north track are assigned to a position either in the storage yard at the west of the carhouse or



Car inspection, wheel changes and running repairs are made at this carhouse

All Worcester cars are now operated from this carhouse. Equipment indicated includes *A*, saw table; *B*, motor-driven hack saw; *C*, drill press; *D*, grinder; *E*, forge; F, fan; *G*, bending machine.

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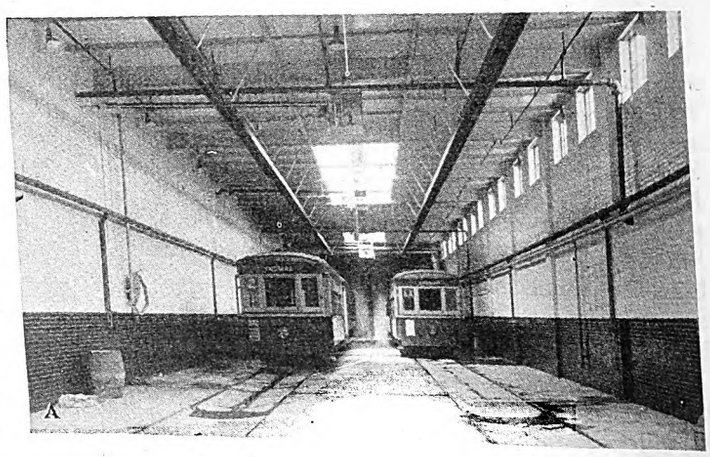
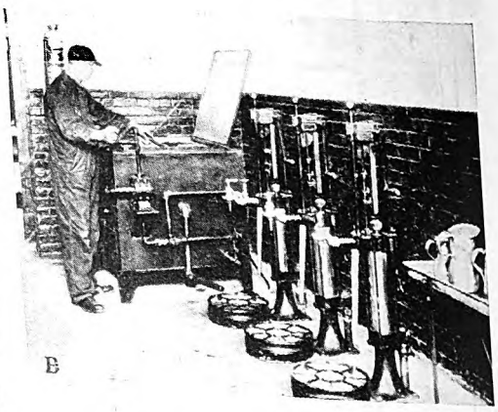
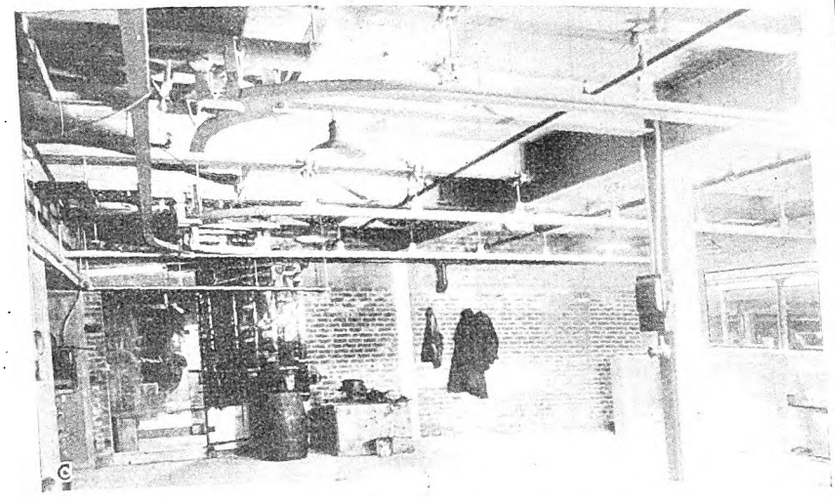
are run around and into the building from the south. Cars leave the building from the north end, establishing continuous movement between the yard and the several carhouse bays without switching or interference.

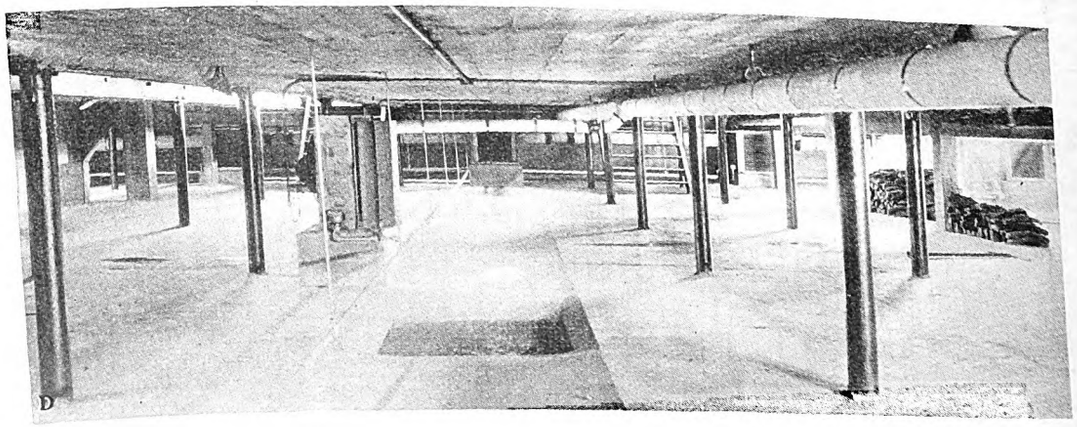
A total of 425,000 passenger car-miles per month are operated from this house. At present the base schedule from Grove Street calls for 76 cars with 94 scheduled extras, making a total of 170. The building will hold from 32 to 40 cars, depending on how closely they are spaced. The outdoor storage section west of the building will accommodate 144 cars, and the tracks at the north and south end will store 24 additional. This makes a total capacity of 200 cars, or 208 if the carhouse itself is closely filled. By placing cars on curves, north-and-south lead-in tracks, spur track to the coal bunker, etc., many additional cars can be stored.

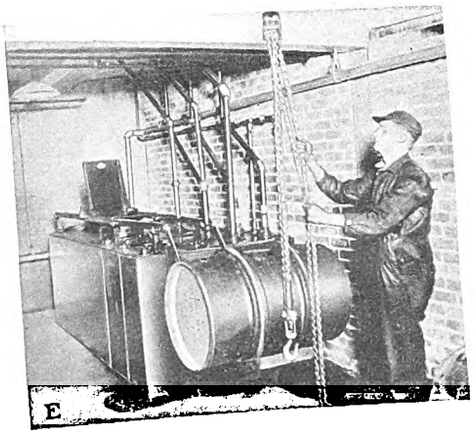






Convenient Facilities Are Found Throughout This Modern Carhouse





A—Well lighted and drained wash bay.

B—Oil pump room and waste treating equipment.

C—Wheel storage room in basement. Opening at right leads to wheel hoists in pits. Note monorail on ceiling for handling wheels.

D—View taken under carhouse floor showing open pit construction. Note ample drainage facilities, space heaters in background and near center of illustration.

E—Oil storage tanks and barrel hoist in basement under oil room.

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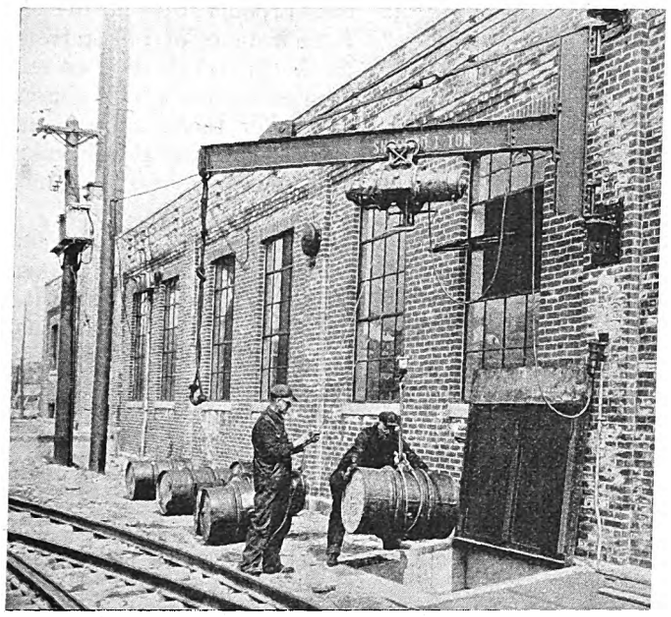


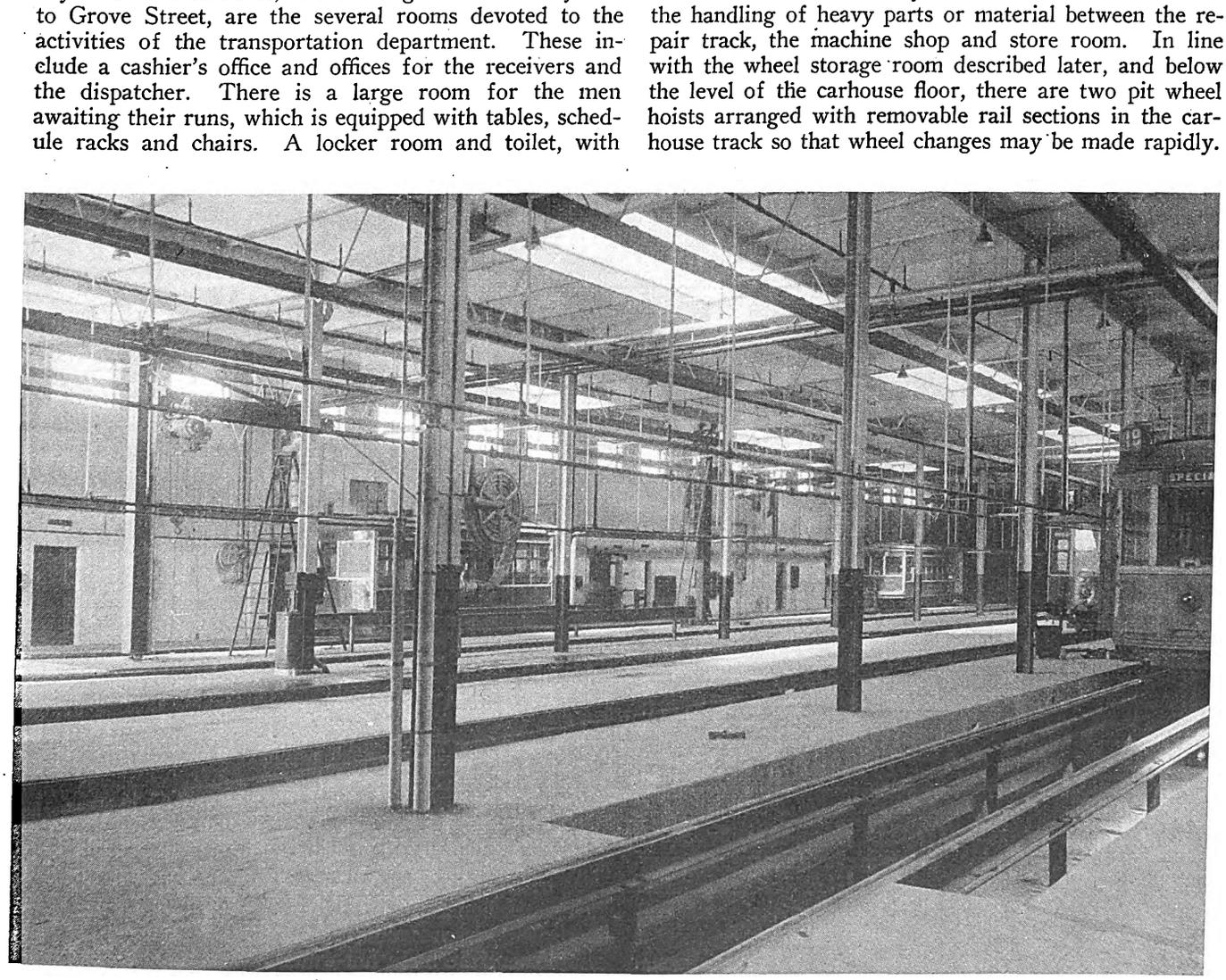
Bracket hoist on carhouse west wall for handling oil and wheels from spur track to pits leading to storage rooms in basement

The carhouse building is divided into four principal bays. On the east side, in the triangular section adjacent to Grove Street, are the several rooms devoted to the activities of the transportation department. These include a cashier's office and offices for the receivers and the dispatcher. There is a large room for the men awaiting their runs, which is equipped with tables, schedule racks and chairs. A locker room and toilet, with Bradley wash fountains and an electric hand drier, adjoins the men's room. There is also a lunch room and telephone booths.

Adjoining the quarters for the transportation department is the car-washing bay which has two tracks with ample capacity for four cars each. In this bay there are numerous hot and cold water outlets and adequate drainage facilities. The hot water is supplied through a loop system of piping, and the concrete floor slopes sharply toward the several drains.

Next to the wash bay is the main section of the carhouse devoted to running repairs and inspection. Six tracks in this bay are supported on 4½-in. Lally columns to form an open pit below the entire carhouse floor. Two of the pits have side trenches to facilitate truck inspection, etc. These side pits are floored with diamond steel plates and the sides are open so that they drain readily and may be easily cleaned. The drainage of all pits was laid out so that they might be kept dry during wet weather. Between each pair of pits there is a wide drainage trench with ample sewer connections.

Facilities for hoisting and handling of heavy parts in this section of the building are indicated in an accompanying drawing. On the two west tracks adjoining the machine shop and store room there are two Columbia car hoists. Two jib cranes with 3-ton electric hoists and an overhead I-beam trolley are so located as to facilitate the handling of heavy parts or material between the repair track, the machine shop and store room. In line with the wheel storage room described later, and below the level of the carhouse floor, there are two pit wheel hoists arranged with removable rail sections in the carhouse track so that wheel changes may be made rapidly.



General interior view of Grove Street carhouse inspection bay. Note drop side inspection pit, Columbia car hoist and jib crane

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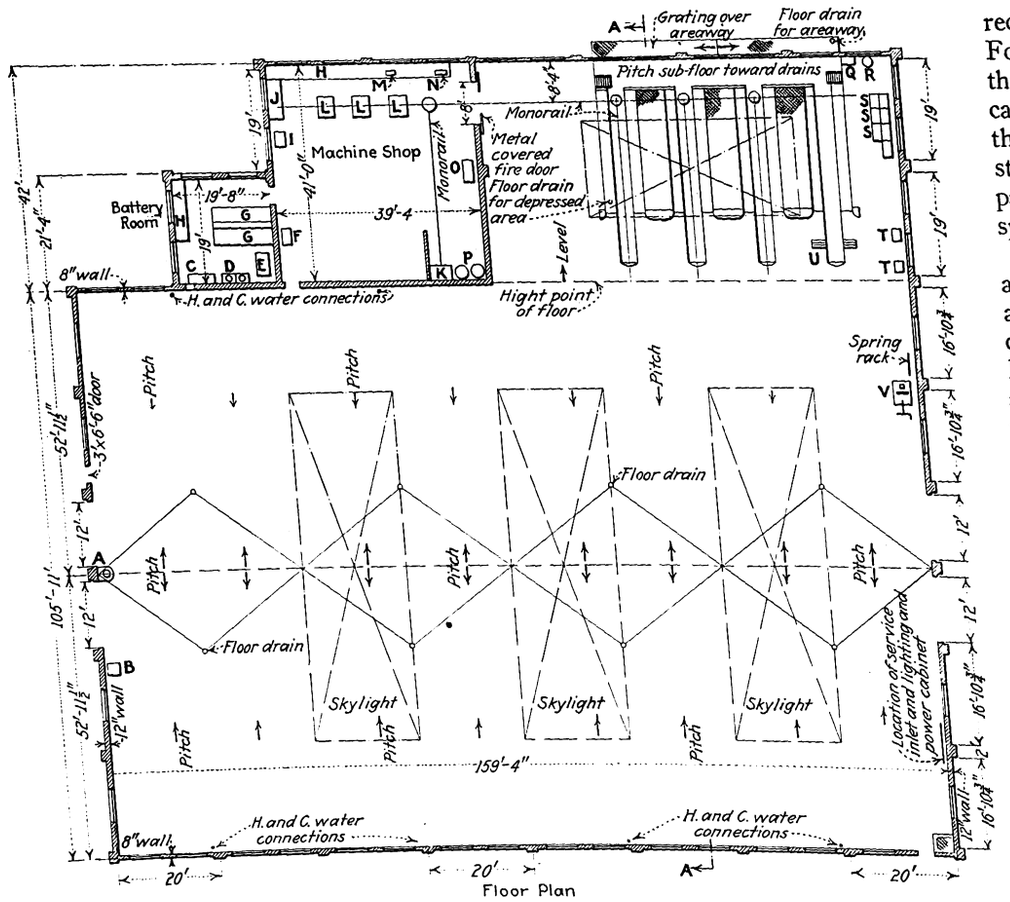

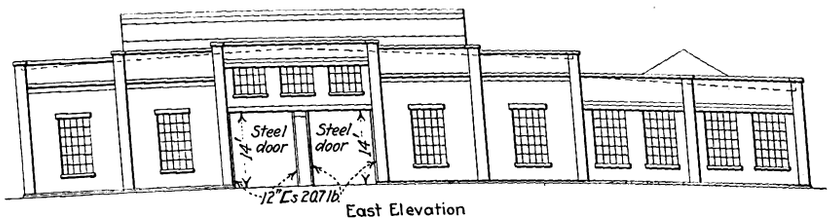

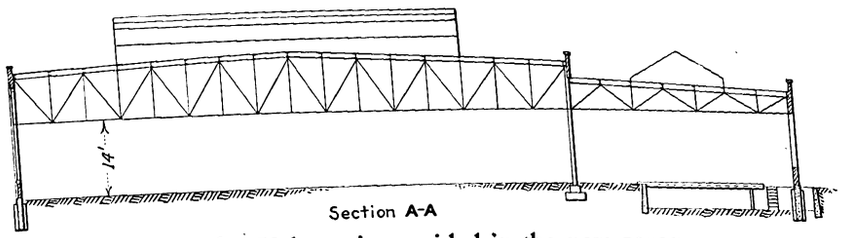

Capacity for 50 buses is provided in the new garage

It has a floor area of 20,000 sq.ft. A well-equipped repair shop and a conveniently arranged depressed section for bus inspection and overhaul are special features of interest. Some of the equipment includes, *A*, Bowser nozzle controlled gas pump; *B*, gas meter in fill pipe; *C*, battery wash tank; *D*, acid crocks; *E*, constant potential battery charger; *F*, Elmco ignition test stand; *G*, battery charging rack; *H*, work bench; *I*, Relio grinder; *J*, large Wadell bearing outfit; *K*, solution tank; *L* heavy-duty motor overhaul stands; *M*, Reamo bench reamer; *N*, bench grinder; *O*, 60-ton Manley press; *P*, McKee cleaning outfit; *Q*, Alemite grease compressor; *R*, transmission oil pressure tank; *S*, oil storage tanks; *T*, brakelining machine; *U*, Cowdrey brake tester; *V*, spring assembly vise.

Along the west side a section approximately 30 ft. wide and running the full length of the building, approximately 207 ft. long, has been divided for shop, office and store room facilities. Beginning at the south end, there is one 29x40-ft. 6-in. machine shop, then a blacksmith shop and tool room, an office for the master mechanic, store rooms for headlights and markers, glass, oil and waste; a 29x30-ft. stock room, lavatory and toilet for mechanical employees and large locker and recess rooms at the north end. For a distance of 144 ft. from the north end there is an excavated section which houses the boiler room, a basement store room for heavy or bulky parts, an oil storage room and space for wheel storage.

Between the boiler room and the basement store room are a heavy-duty, 65-cu.ft.-capacity, 200-lb. National Brake & Electric Company air compressor and a Spencer vacuum cleaner pump. These serve both the carhouse and the garage. The switchboard here controls all 500-volt direct current; 500-volt three-phase, 60-cycle alternating current, and 110-220 volts, three-wire alternating current for light and power.

Two boilers furnish steam for heating the carhouse and garage. Standard radiators and steam coils are in most of the small rooms and offices. Throughout the carhouse and garage, unit-type base heaters with fans are located at points to give uniform heat distribution. The use of these unit-type heaters for keeping the carhouse pits at a comfortable temperature is particularly interesting and has worked very satisfactorily. There is a series of gratings in the carhouse floor just inside the Kinnear doors, and in the pit below these gratings are the unit heaters. The fans on the heaters draw cold air down from around the doors and force it through the unit-heater steam coils out into the pit. These heaters at either end of the pit are supplemented by additional heaters placed at intervals under the carhouse floor between pits. With this arrangement the pits are kept dry and warm even in cold weather.

In the boiler room there are ample coal bins, ash-handling hoists, hot water circulating pumps, a sump pump, return vacuum pump, separators for the vacuum cleaning system (one for ordinary service and the other for taking care of soot, etc., when cleaning the boiler tubes) and a hot water boiler for supplying the carhouse and garage. Returned steam from the heating system is used to supplement the main hot-water heater.

In addition to the heavy materials store room in the basement there are spaces for oil storage and wheel storage. An areaway extending out from the building within

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convenient reach of a spur track from the car storage yard, is served by a jib crane with electric hoists mounted on the building, as shown in the illustration. This gives a convenient means for handling oil barrels or car wheels from a supply car to the basement pit leading into either the oil storage room or the wheel room.

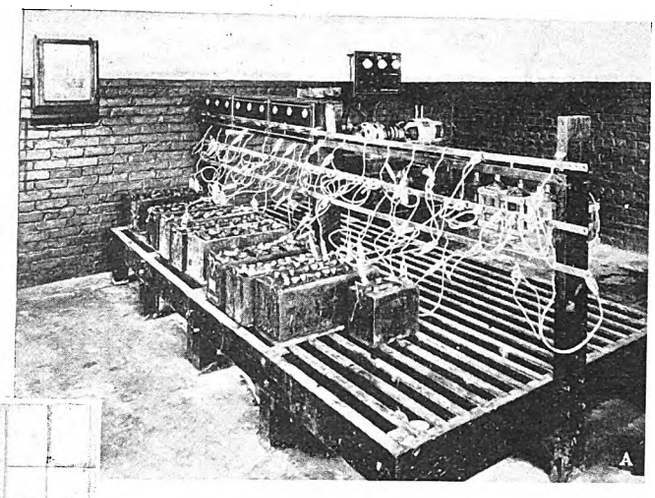
Bowser oil storage tanks in this basement room connect with pumps in the oil treating room immediately above. A barrel hoist permits oil to be conveniently poured into the storage tank. In the pump room above is an S. F. Bowser waste treating plant adjacent to the oil pumps.

The wheel storage room is served by an outside pit from the same jib crane and 1-ton Shepard electric hoist that serves the adjacent oil room pit. Within the wheel store room is an overhead monorail with a hoist. Wheels may be picked up from the floor of the store room and carried by the monorail through an opening in the foundation wall into the pit space under the main carhouse floor. At this point they are set on rails on the pit floor and can be rolled directly to the jacks where they are lifted into position in the truck on cars setting on the pit track above. The lift is accomplished by hydraulic pit hoists and removable sections of rail.

In the northwest corner of the garage building are the repair shop, 39x41 ft., and the battery room, about 19 ft. square. An 8-ft. fire door from the repair shop into the garage leads directly to the depressed floor area in the northeast corner of the building where bus inspection and overhaul work are done. The depressed section is approximately 4 ft. 6 in. deep. Overhead runways give space for four buses, and the remainder of the floor is covered with subway grating so as to give ample ventilation. Beyond the bus runway there is room for a long work bench on the depressed level to which stairs on either side give convenient access. Alemite grease and transmission oil are piped directly from a grease compressor and an oil pressure tank to outlets at several points in the open pit section from which buses may be lubricated conveniently.

The first runway on the east side of the pit section is used for mileage inspection. A Cowdrey brake tester is set flush with the garage floor so that bus brakes can be tested while other inspections are being made. The pits are served by a monorail running across the entire depressed section and communicating with the repair shop so that motors and other heavy parts may be moved directly between the pits and the shop.

Along the east wall on the garage floor level and adjacent to the inspection pits are the oil storage tanks and a brakelining machine. Here also there is a rack for springs and a spring assembly vise.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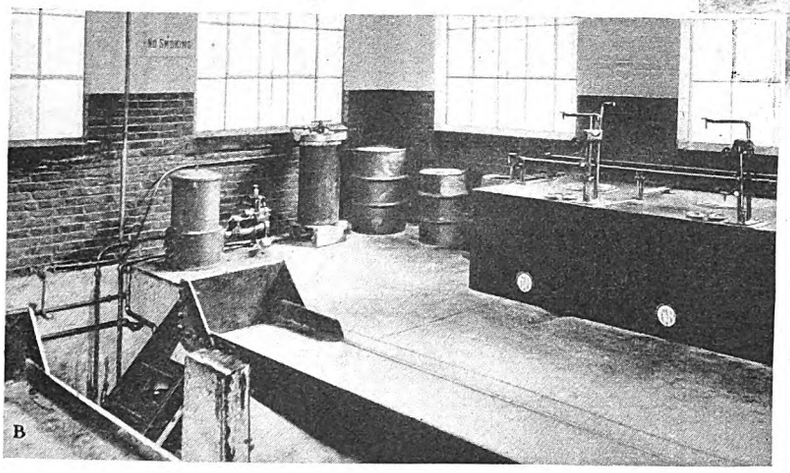
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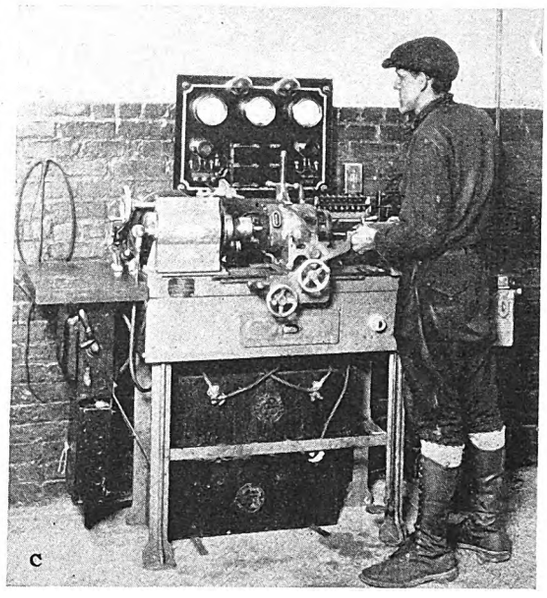
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Modern bus maintenance facilities feature the new Worcester garage

A—Battery charging room with special rack for holding batteries. Against the wall behind is the constant potential motor-generator charging unit.

B—Oil storage tanks, Alemite grease pump, and transmission oil pressure tank in northeast corner of garage—adjacent to pit section. Note design of end stops on bus runways over pits in left foreground.

C—Elmco starter and ignition testing equipment in bus shop.

The Grove Street plant is primarily a carhouse and only necessary running repairs are made there. All major overhauling and any large machine jobs are done at the Market Street shops, where ample machine facilities are available. Only limited machine equipment, including a motor-driven grinder, small drill press, motor hacksaw and a saw table, together with a single forge, bending machine, benches and suitable hand tools are installed in the carhouse.

An illumination intensity of at least 9 foot-candles is obtained throughout the carhouse. This is intensified by the white color all walls and ceilings are painted. The carhouse is wired for the three-wire system at 110-220 volts, 60 cycles.

While the garage has a total capacity of only 50 buses, at present 23 vehicles are operated from it, and all the major overhauling and repairing on some 55 buses are taken care of. The total bus mileage operated is approximately 200,000 per month.

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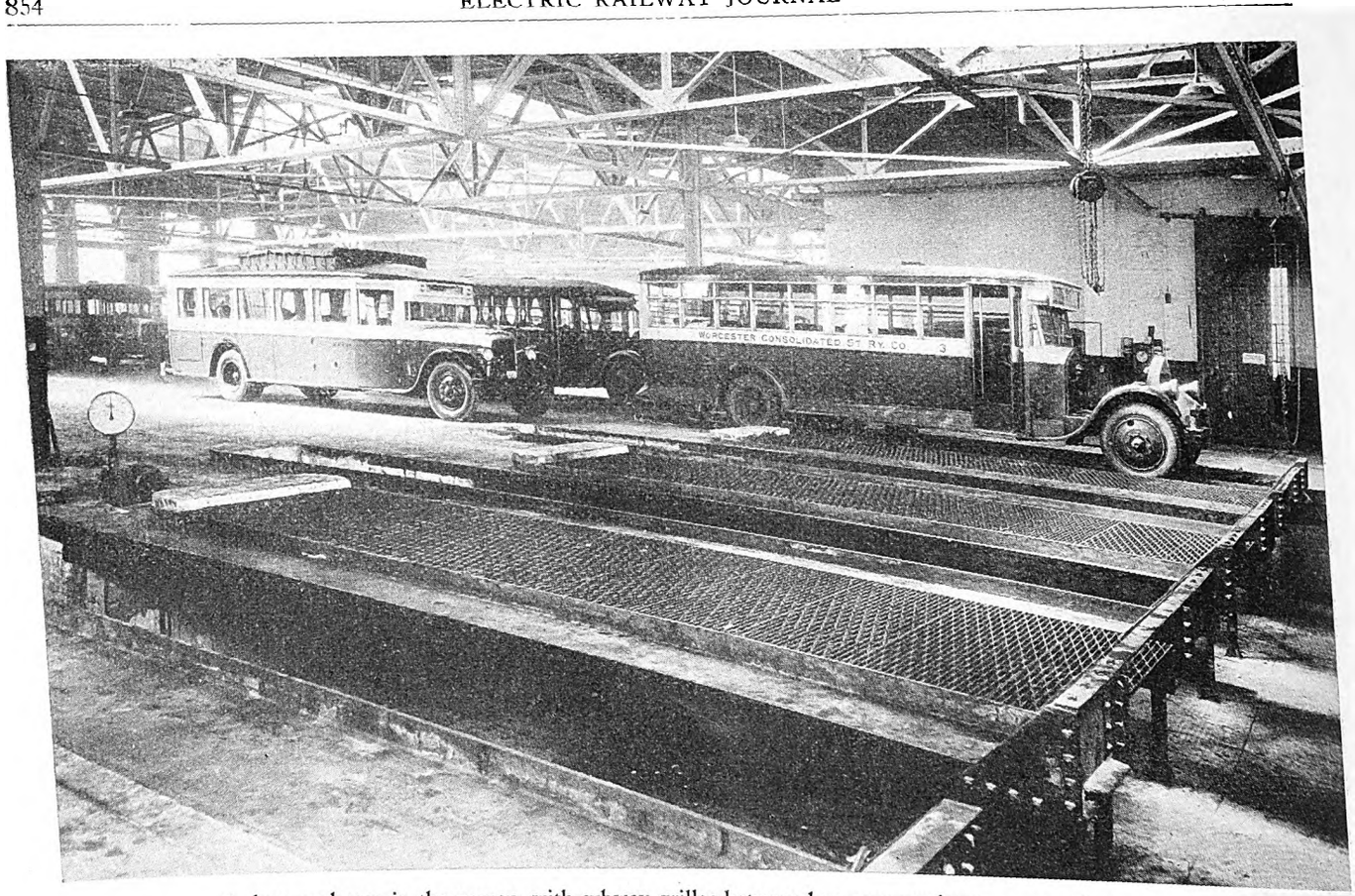
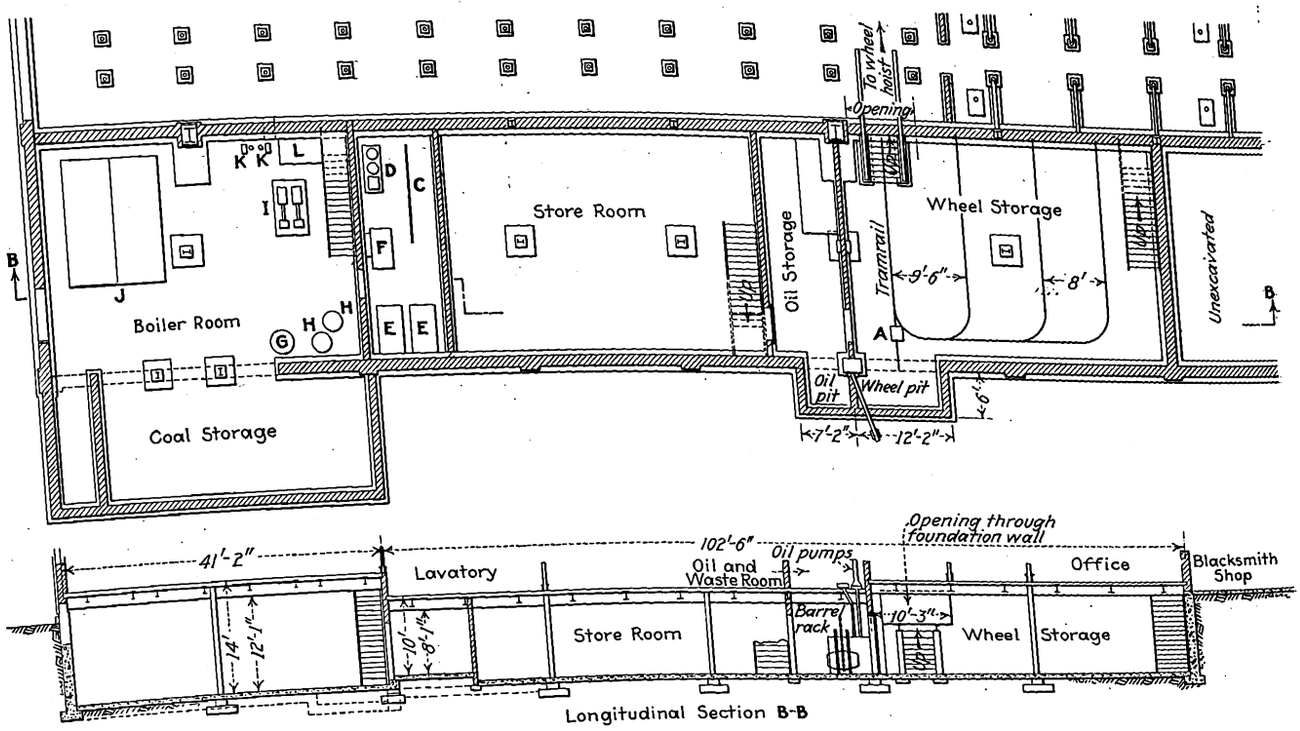


A depressed area in the garage, with subway grilles between bus runways forms a convenient open pit. **At the extreme left is a Cowdrey brake tester set flush with the garage floor**



A basement section along the west side of the carhouse provides space for boiler room, heavy stores, oil and wheel storage

The basement equipment includes *A*, electric wheel hoist; B, outdoor bracket cranes; *C*, switchboard; *D*, heavy-duty National air compressor; *E*, hot water tanks; *F*, vacuum cleaner; *G*, hot water heater; *H*, vacuum cleaner separators; *I*, return pumps; *J*, boilers; *K*, hot water pumps; *L*, sump and sump pump.

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In the repair shop are a 60-ton Manley press, heavy-duty motor-overhaul stands, a Reamo bench reamer, a large Wadell bearing outfit, a Relio wet grinder and an Elmco test stand for starter, ignition and generator overhaul. There is also a McKee outfit for cleaning all parts that are taken off the buses. In the battery room there is a constant potential motor-generator charger set with battery racks having capacities for 36 batteries. In this room there are also work benches, battery wash tanks and acid crocks. Gasoline is stored in a 5,000-gal. underground tank with a Bowser nozzle-control, air-operated gas pump located inside the building between the two entrance doors. An Xacto flow meter on the filling pipe permits a check to be kept on the amount of gasoline received. No provision is made for body work or painting in the garage, as this work will all be done in the main shop at Market Street.

As indicated on an accompanying drawing, the garage floor is pitched to provide drainage to two lines of drains. Along the south wall of the building there are four hot and cold water outlets for washing. Numerous electric outlets along the other walls of the building and at the pits provide convenient connections for hand tools and portable lamps.

Chair Car is Popular in St. Louis

St. Louis Public Service Company is receiving much favorable comment on its trial car using individual bucket type seats

ON MARCH 28 the St. Louis Public Service Company, St. Louis, Mo., introduced to the patrons of the Grand Avenue line a new chair car furnished with 43 individual seats and having other interior improvements. The car ran on this line for four days and then was put in service in successive intervals of two or three days on six other lines. It was operated on a changing schedule so that a great number of people were able to ride in it. Post cards distributed by the conductor were used by many patrons to express their sentiments concerning the car.

The seats are of the individual bucket type and are covered with cane. The edges of the arms and back are bound all around with aluminum strips. The seats are supported by iron pedestals fastened firmly to the floor. They are placed at an angle of 45 deg. to the length and are tipped back slightly. Ample knee room and privacy are afforded by this arrangement. The deep-seat cushions are upholstered in genuine Spanish leather.

Instead of hand straps the car has white-enameled stanchions from floor to roof. The aisle is wider than in the standard type of car and accommodates a larger number of standees. Frosted lamps are used in the car and are so located that the passengers receive the light over their shoulders. A shelf behind the seats and next to the windows is provided for packages.

Privacy is afforded patrons of the St. Louis Public Service Company who use this car

More than 97 per cent of those who wrote cards gave the new car their unqualified approval. Nearly every correspondent stressed the word "comfort," indicating that this is what patrons appreciate most as riders of the street cars. A great deal of comment was devoted to the soft light which came from the frosted bulbs, making reading a pleasure, while others mentioned a consciousness of respectability of all passengers being separated and riding as individuals. The general trend of sentiment on the many cards received is expressed in a few of the typical replies, appended here:

Very comfortable. Especially good for reading, as the light comes over the shoulder.

I think you should do away with all of your old equipment and place these cars on all your lines and charge a 10-cent fare.

The new car is delightful. Seats very comfortable. Better arrangement for standing space.

This car has all of the comforts of a bus, with better lighting and heating system, and no danger of skidding or turning over.

Better lighting arrangement. With more space in aisles, less chance for crowding and congestion on board. Even standing accommodations are better. Would like to see these cars on all lines in the city.

Very much impressed with this new car. It eliminates crowding in the aisles. Impossible to stumble over patrons' feet. Certainly seems to be another forward step in your rapidly improving service to the public.

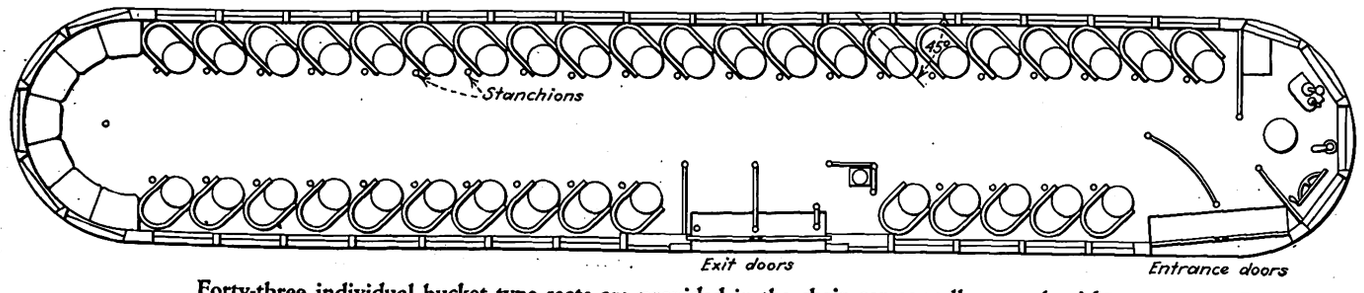
A daring and dangerous innovation in that no one who uses it will ever be content to ride in any other.

On boarding this car my first impression was that I was entering a well-lighted sitting room, full of comfort and good cheer.

Something St. Louis should be proud of. Something different. More sanitary. Not merely riding to get there, but taking a ride for pleasure. I think the individual chairs are great for comfort alone. I could stay in one and read all day with the utmost satisfaction.

I think the new seating arrangement very satisfactory. I was so comfortable that I was loath to leave the car.

Mighty fine. Privacy. Comfort and convenience. If you had cars like these on all your lines, we'd never ride the buses nor drive our own cars to work.



Forty-three individual bucket type seats are provided in the chair car as well as ample aisle room

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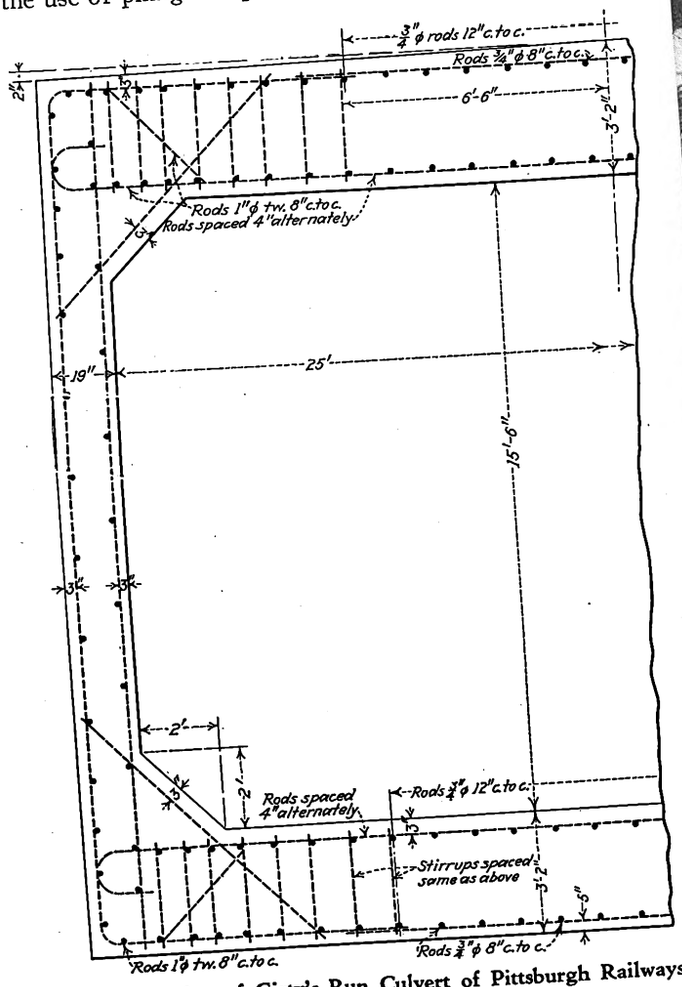
Culvert Built Under Difficulties

By M. R. Sumner

General Superintendent of Construction Pittsburgh Branch, Byllesby Engineering & Management Corporation

MORE than usual difficulty was encountered in the replacement of the Girty's Run Culvert across the Millvale carhouse yard of the Pittsburgh Railways. An old rubble stone culvert of rectangular section, 10 ft. wide, 8 ft. high, and roofed with a stone arch, had been in use about 50 years and its weakened condition necessitated its replacement. The floor of the old culvert, originally of 10x16-in. white pine timbers was found to be worn to a 4-in. thickness in some places.

The new concrete culvert has a rectangular frame. While statically indeterminate and rather difficult to design, it permits simple construction, since it obviates the use of piling and permits a symmetrical arrangement



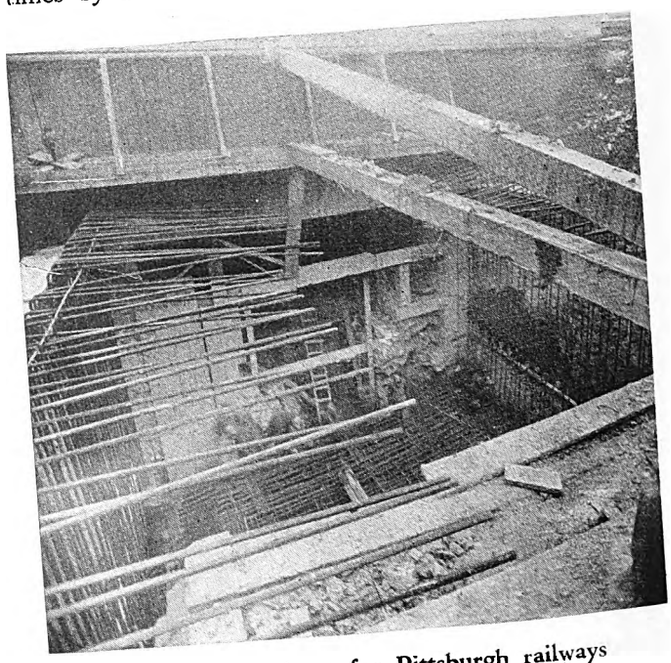
Cross-section of Girty's Run Culvert of Pittsburgh Railways

of the reinforcing steel. As completed, the new culvert is 201 ft. long, 25 ft. wide, and 15 ft. 6 in. high, and is roofed its entire length. The width was specified by an ordinance of Millvale Borough.

The normal flow of Girty's Run was diverted temporarily into a 36-in. sewer by a dam erected about one-quarter mile above the culvert, while water entering below the dam was run through a series of 4-in. pipes laid over the portion under construction. Another dam was built at the river end of the run to keep out back water. Both of these dams proved insufficient in times of high run-off or high river stages. The upper one could only divert normal flow, and in time of rain excess water delayed construction work. High water in the river washed out the lower dam a number of times where a No. 9 Pulsometer pump cared for normal leakage.

The work was started in July, 1927. High water halted the work from Nov. 25 to Dec. 6, and again from Dec. 12 to 20. The latter flood was the highest recorded in years. These floods necessitated excavation of one 28-ft. section three times, as each time the water filled in the trench.

Excavation was done by a stiff-leg derrick, aided at times by a steam shovel and a gasoline driven crane.



Building a culvert for Pittsburgh railways

In the center background is the old culvert channel, while the walls of the new are clearly shown. Some material remains to be removed before the new culvert is opened to its full width.

The derrick services were limited at certain spots due to interference of the trolley wires in the carhouse yard. An engine foundation of masonry was uncovered that lay between 8 and 10 ft. below the surface and was 10x 12 ft. in area, with a depth of 12 ft. This also had to be removed.

The concrete mixer was placed directly over each section as it was poured. The mixer was loaded by batch skips which were filled by hand. The skips were handled by the stiff-leg derrick. The job was handled under the supervision of W. J. Millington of the Pittsburgh branch of the Byllesby Engineering & Management Corporation and cost approximately $100,000, being somewhat higher than originally anticipated, due to the presence of high water and other delays.

Taxes Doubled in Eight Years

THE single item of taxes and compensation paid the city by the Chicago Rapid Transit Company, operating the elevated lines in Chicago, gives an idea of the way in which operating expenses have increased. For the year 1919 the taxes paid by the company were $908,057. For the year 1927 the amount was $1,755,365 —almost doubled in eight years.

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International Association Meets at Rome

Reports on one-man car operation, track design, radial trucks, fare collection and construction of reservations were presented and discussed. The association was organized in 1885, and the Rome meeting was the 21st in its history

REPORTS have been received of the opening sessions in Rome of the 1928 Convention of the Union Internationale de Tramways de Chemins de fer d'Intérêt local et de Transport Publics Automobiles. The last convention of this association was held in Barcelona in 1926.

The first meeting of the Rome Convention was held in the Senate Room at the National Capitol in Rome. As the Senate was not in session, this auditorium was placed at the disposal of the association by the Italian government. The convention continued from May 6 to 12. It was followed by a trip through northern Italy, during which the delegates had an opportunity to inspect the electric railway systems in Turin and Milan.

The association was organized in 1885, and the meeting this year was the 21st in its history. It was also the first meeting of the association to be held since the war at which delegates from Germany and Austria have been present. The reunion in one association of railway representatives from the former belligerent countries was brought about through the efforts of railway managers from certain of the countries which were neutral during the war, such as Holland and Switzerland.

Abstracts of some of the papers presented at the Rome Convention are published in this issue. Others, with a report of the meeting itself, will appear in later numbers.

Radial-Axle Cars

By Charles Harmel

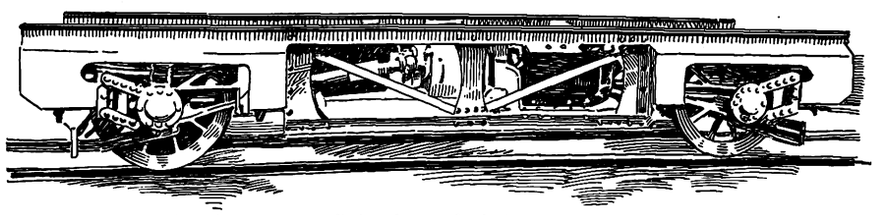
General Manager, Liége Consolidated Street Railway Company, Liége, Belgium

RADIAL car axles always have had a number of advocates in Europe The experience with them has been varied. The results of replies received from a questionnaire are given in the accompanying table. The Albrecht truck, at Ruhrort, is used in connection with Cardan drive motors.

It must not be forgotten that the axles of a moving motor car are subject to the force of propulsion as well as the reaction caused by the contact of the wheel flange and the rail guard. The couple resulting from these forces tends to prevent the axles from taking a radial position on the curve. Even an absolutely free axle will not do so entirely, because as the wheel on the outside of the curve tends to take this position, the reaction from the wheel on the inside of the curve tends to keep the axle at an angular position.

Efforts of truck designers to produce radial action of car axles on curves may be divided into three classes, depending on the location of the force needed for radiation, namely: (1) if at the center of the axle, (2) outside of the axle toward the ends of the car and (3) between the axles towards the center of the car. It is the opinion of the author that only those radial axles depending on the third principle will give satisfaction. This principle naturally calls for a three-axle truck. Several of these have been designed. One developed by P. Algrain of the Croyère Company, will be tried on the Brussels system.

Based on the same principle the Winterthur Locomotive Works has built an experimental car, equipped for Cardan drive, in which the motors are mounted on small four-wheel trucks between the two driving axles. This car has been



Albrecht-Krupp radial axle truck designed for Cardan drive

SUMMARY OF RADIAL AXLE SITUATION IN EUROPE, BASED ON QUESTIONNAIRE

Name of System	Number of Cars With Radial Axles	System of Radial Axles Used on Motor Cars	Results Obtained	Comments
Paris Surface Lines	8 m.c. 114 t.c.	Exterior axle type with two diagonal connections.	Radiation defective, bad effect on track, maintenance costly.	Radial axles will be abandoned in favor of fixed axles.
Bordeaux	9 cars	Delmez system without any connections.	Radiation good, economy of energy shown, less tire wear.	Will standardize on this type.
The Hauge	5 cars	Kamp system, one diagonal connection.	Test being conducted.	.....
Glasgow	2 cars	.....	Test being conducted.	.....
Leeds	200 cars	Central axle type with two connections.	Less wear on tires, better traction.	Will standardize on the radial system.
Basle	82 m.c. 68 t.c.	Link axle system with no connection.	Radiation defective but not much difference in tire wear than with fixed axles.	Expect to abandon.
Geneva	6 cars	.....	No radiation found.	Will abandon.
Liége	6 m.c. 12 t.c.	Kamp system.	Radiation favorable but not perfectly fulfilled.	Will continue trial.
Ruhrort	4 m.c.	Albrecht system with axle support on horizontal arms.	Radiation favorable, economy of energy, less wear.	Will standardize on this system

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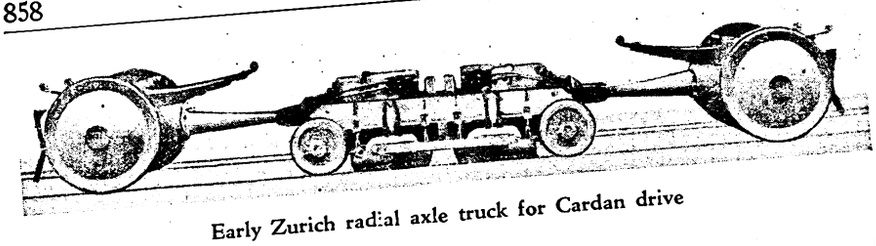
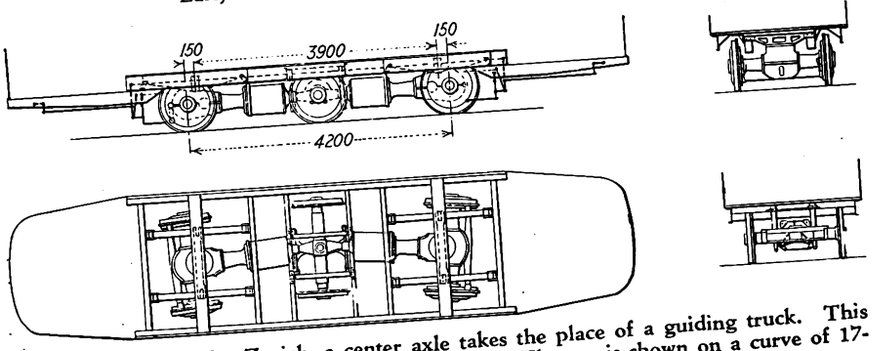


Early Zurich radial axle truck for Cardan drive



In the latest design for Zurich, a center axle takes the place of a guiding truck. This axle does not carry any weight of the car body. The car is shown on a curve of 17-meter radius

put in experimental service in Zurich (see ELECTRIC RAILWAY JOURNAL for Aug. 21, 1926, page 297), and another car is being built for Luxembourg. The Luxembourg car will have a wheelbase (distance between driving axles) of 5 meters (16 ft. 5 in.), while the small interior driving truck carrying two motors, will have a wheelbase of 2 meters (6 ft. 7 in.) This car rounds a curve with a radius of 15 meters (49 ft. 3 in.) The latest design in which the single axle takes the place of the central truck is shown in the diagram above.

The trial in Zurich has been too short to give any definit results.

In conclusion, it might be said that parallel axles can properly be used on roads not having short radius curves and where the wheel base does not exceed from 10 to 11½ feet. Elsewhere axles which actually radiate are worth considering, providing their maintenance is not too high.

Electric Railway Construction on City Reservations*

By J. LENARTOWICZ

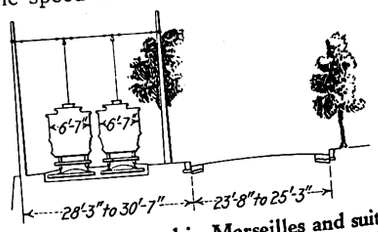
Assistant Manager Warsaw Tramways, Warsaw, Poland

PROVISION for adequate passenger transportation is a necessity in proper city planning understood better now than formerly. In emphasizing this need, reports presented at previous meetings of this association have had an important part. Adequacy in this connection is understood to mean sufficiency both in capacity and in speed. The time which a passenger has to take for travel between his home and his business usually has an important influence on his choice of the locality which he will select for his residence. To care for this transportation, areas added to large cities should be provided with broad radial avenues as well as belt or crosstown boulevards on which electric cars can operate.

Preferably the track should be laid in a reservation in these streets rather than in the portions of the highway devoted to other traffic. If the latter plan is followed, the car schedule speed can rarely be higher than from 7½ to 8 m.p.h., falling to 5½ m.p.h. in the narrow congested streets in the center of the city. On the other hand, on reservations, a speed of from 12½ to 15 m.p.h. can be obtained between stops. Except at street intersections, such reservations should be separated from the portion of the street used for vehicular traffic by curbing or other means.

A number of different types of such reservations exist in European cities. Several are reproduced in section in the accompanying small sketches. The first section shows a construction suitable for locations such as along the sides of rivers, canals or steam railroad lines. It is used in Marseilles.

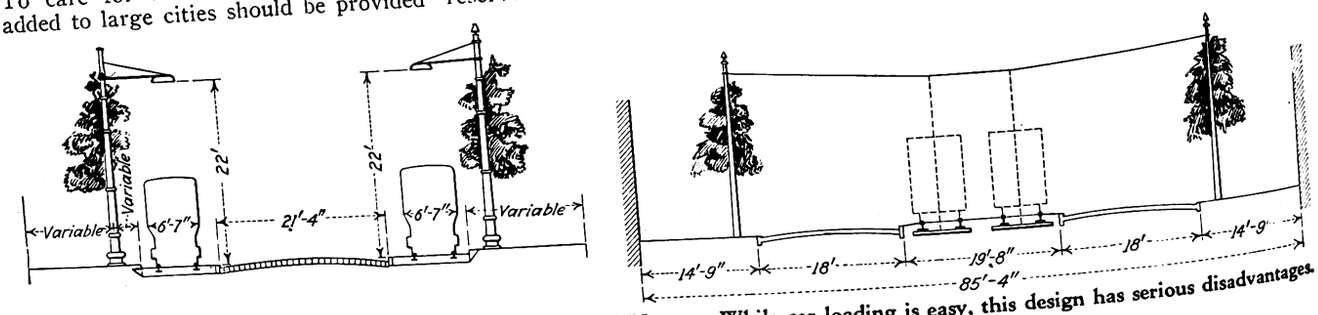
In the second, used on a highway between Paris and Meaux, the tracks are between the sidewalk and the street. This arrangement makes the cars very easy of access from the sidewalk. Some of its disadvantages are: There is greater danger of collisions at cross streets, street vehicles cannot easily reach the sidewalks for loading and unloading, and if track repairs have to be made it is complicated to shunt cars from one track to the other. On the whole, the plan does not help much in increasing the speed of the cars.



Construction used in Marseilles and suitable for routes adjoining a river, canal or steam railroad line

The third section, where the reservation is in the center of the street, shows a better arrangement. It is possible in streets 85 ft. 4 in. wide to leave a space 19 ft. 8 in. for the cars, 18 ft. on each side for vehicular traffic and 14 ft. 9 in. for the sidewalk, but it means that the span poles will have to be placed in the curbs. A better construction, where the width of the street permits, is that shown in the fourth section. It is the plan recommended by the Milan Highway Congress in 1926. With a width of 29 ft. 6 in. for the reservation, it is possible to use center poles and erect loading platforms for the cars on the reservation. A slightly greater width permits the construction used on the Corso Stupinigi in Turin, shown in a view on page 859. Here slow-moving vehicles use the outside highways, and a center highway is reserved for fast-moving vehicles.

From the standpoint of the railway, reservation construction has many advantages, including lower first cost and maintenance for track, lower energy



The section at the left shows construction between Paris and Meaux. While car loading is easy, this design has serious disadvantages. A better plan, where space permits, is shown at the right

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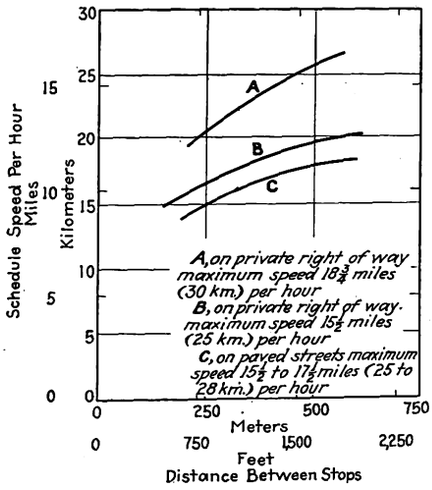
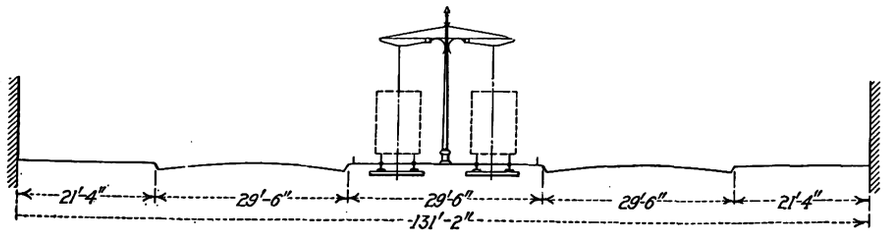


Relation between maximum and schedule speeds and distances between stops

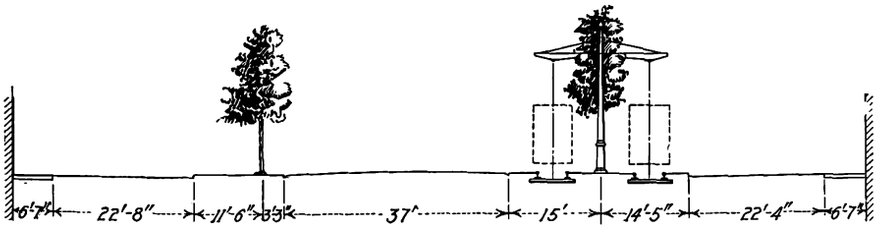
consumption, higher speed, fewer accidents and less noise. On such routes a schedule speed of 12 m.p.h. should be attained, based on a maximum speed of 15½ m.p.h., stops 1,443 ft. apart and eight seconds in duration, an acceleration rate of 1.4 m.p.h.p.s. and a braking rate of 2.25 m.p.h.p.s. On the Corso Stupinigi in Turin, cars make a schedule speed of 12½ m.p.h., with a maximum speed of 15½ m.p.h. and distance between stops of from 2,300 to 2,600 ft. Other companies operating over reservations report maximum speeds of 18¾ m.p.h. The accompanying graph of possible schedule speeds has been compiled by Prof. E. Giese of Berlin, based on seven-second stops, an acceleration rate of 1.7 m.p.h.p.s. and a braking rate of 2.5 m.p.h.p.s.

The speeds obtained on street railway lines in reservations approximate those on rapid transit lines, and while these routes have the disadvantage that they have to conform to the grades of streets and are handicapped by frequent street intersections, they are far less expensive to construct than subways or even elevated railways. Moreover, the cars are much more accessible to passengers. Later, if future development in city growth seems to demand the construction of rapid transit lines, one can be built as an elevated or subway either above or below the reservation much more economically than if no reservation existed.

To permit the highest rate of speed on reservations, overhead or underground crossings for pedestrians and vehicles should be substituted for grade crossings where possible.



This center arrangement of tracks was indorsed by the 1926 Milan Highway Congress



On the Corso Stupinigi, in Turin, the outside highways are for slow-moving vehicles and the center for fast-moving vehicles

One-Man Car Operation in Holland

By P. M. Nieuwenhuis
Manager of Municipal Tramways, Arnhem, Holland

IF THE results with one-man cars have been less satisfactory in Europe than in America the reason has been largely because a lack of capital to purchase new cars has induced many properties to try to use old and unsuitable cars for one-man service. American practice dictates in the one-man car the need for platform doors or gates which can be kept closed when the car is in motion. We have followed this practice in Arnhem, where since January, 1924, one-man cars have supplied all the service. Our first trial was with a car with a capacity for 18 seated and 14 standing passengers, with entrance on the front platform. For larger cars, or those holding 25 seated and 19 standing passengers, front entrance and rear exit are used, with manually operated doors or gates, interlocked with the controller. The arrangement on the rear platform is such that it is impossible for a person to enter from the rear, and we have suffered no trouble from this source. What in effect is a dead-man's handle has been added to the controller, but the spring on the controller handle is held down by a pedal, instead of by a button, as in the American design.

On our city lines we have a flat fare of 10 Holland cents (4 American cents), and the passenger is requested to have the exact amount ready. As fares are paid, the passengers receive receipts which entitle them to transfer to any other line, provided they keep traveling in the same direction. The time limit is indicated on these tickets by a pencil mark. The operator marks up a number of tickets in advance of each trip. On interurban lines zone-fare tickets are used, but as many passengers on these lines use commutation tickets which simply have to be shown to the operator, fare collections are not complicated. We estimate our savings at 6,000 florins per year per motor car.

Six other cities in Holland use one-man cars, namely Amsterdam with 700,000 inhabitants, Haarlem with 80,000 inhabitants, Groningen with 100,000 inhabitants, Leyden with 60,000 inhabitants, Utrecht with 150,000 inhabitants, and Enschede with 40,000 inhabitants. In most of these, entrance and exit are on the front platform, but only the cars in Amsterdam and Arnhem have separate passages for exit and entrance. Door and step mechanism usually is manual.

The Amsterdam service was begun in 1924, originally with five cars on a route with a fairly busy service (averaging 24 passengers per car-mile). Fare boxes are used and as in Arnhem the "dead-man's control" pedal is used. The doors and steps are actuated by a ½-hp. electric motor carried in the hood and interconnected with the controller. This mechanism operates about 200 times a day, but during four years has caused no trouble. When the brakes are set a red lamp lights in front of the operator and burns as long as the brake circuit is closed. Another red lamp on the platform lights when a passenger presses a push button and remains burning until the exit door is opened. Smoking is allowed on the rear platform. The front of the car carries a sign that the car is run by one man. Amsterdam has now about 100 one-man cars in service.

After some trial with entrance and exit in front, the exit in Amsterdam was changed to the rear, and the rear platforms were supplied with turnstiles to prevent unauthorized entrance. The city authorities took a hostile position to them, however, on the ground that they would impede rapid exit from a car in an accident, and the turnstiles were given up.

Tickets are issued by an automatic ticket-issuing machine.

There has been no reduction in schedule speed with one-man car operation. In fact, we found one-man cars have higher schedule speed than the former two-man cars.

Similar satisfactory results have followed one-man operation of motor buses in Holland. The principal points in the success of one-man car and bus operation is to adopt equipment which will enable the public to board and alight from cars quickly, to teach them to do so, and to secure the co-operation of the personnel.

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Parallel Versus Radial Axles for Cars

By Jean Castaing,
Chief Engineer of Rolling Stock, S. T. C. R. P.
(Paris Surface Railway and Bus Lines)

PROPER car body and truck design has been the subject of a number of reports presented to this Association. This year a questionnaire was sent out on the use of parallel and radial axles, and 26 companies replied. This report discusses the relative merits of parallel and radial axles. Another report gives data on recent designs of radial trucks.

The number of cars owned by the 26 companies which replied to the questionnaire is given in the accompanying table.

TABLE I—SHOWING CLASSIFICATION OF ALL CARS OF THE 26 COMPANIES REPLYING TO THE QUESTIONNAIRE

	Motor Cars	Trail Cars
Cars with four wheels and parallel axles	6,437	3,376
Cars with four wheels and radial axles	897	40
Cars with eight wheels and double trucks	1,056	727
Totals	8,390	4,510

As will be seen, the cars with radial axles make up only 10.7 per cent of the motor car group and 9 per cent of the trail car group.

Omitting consideration in this total of double-deck cars, whose use has been almost completely given up on the continent of Europe, the motor cars in this table range in capacity from 30 to 70 passengers and the trail cars from 30 to 80 passengers. The width of the cars varies from 6 ft. 4¾ in. to 7 ft. 3 in. The over-all length of the motor cars varies from 25 ft. 3 in. to 45 ft. 10 in. and that of the trail cars from 20 ft. 4 in. to 41 ft. 4 in. With very few exceptions the minimum curve radius on the lines replying to the questionnaire is not less than 49 ft. 2 in. (15 meters). The problem presented then is how to get cars varying in length from 20 ft. to 45 ft. around curves with a 50-ft. radius, with a gage of from 4 ft. 8½ in. to 4 ft. 8¾ in.

The rule for a long time on this subject has been that single-truck cars, whose wheelbase does not exceed 10 ft., should operate easily around a curve whose radius is not less than 50 ft., and that cars whose wheelbase is not less than a third of their over-all length will run without nosing or teetering.

To avoid excessive wheel and rail wear as well as energy consumption on curves, efforts have been made to design radial axles which would be satisfactory, but though this effort has been going on almost since the birth of electric traction, the table shows that of the companies replying to the questionnaire only about 10 per cent have their rolling stock so equipped. The writer hopes to show that for most conditions, on lines which have no curves with a shorter radius than 59 ft. (18 meters), single trucks with non-radiating axles are entirely practicable, notably on cars from 20 ft. to 30 ft. in length, and even up to 36 ft. in length.

The motor cars listed in the table can be divided into three groups as follows: (1) Cars without trucks but with motors connected to the axles by nose suspension; (2) cars on independent trucks and motors with nose suspension; (3) cars without trucks and with motors entirely spring supported. Each of these groups may further be divided into cars equipped with pendulum-action journal boxes (like the Peckham) which permit a slight lateral movement of the car body, and those cars which are not so equipped.

Parallel Axles Used on Roads with a Variety of Conditions

From the replies submitted to the questionnaire, those from six representative properties operating four-wheel cars with parallel axles were selected. The wheelbases on these cars vary from 9 ft. 2 in. to 12 ft. 6 in., yet they operate without noticeable wear of the wheels and rails or consumption of energy about curves varying in radius from 50 to 66 ft. If this is possible on the properties mentioned, it would seem as if on the few properties out of the 26 reporting which feel they must have radial axles, the trouble must be due to improperly designed rail grooves or wheel flanges or both. The proper design can be determined. [The report then gives a geometrical treatment of the subject, recommends various wheel-flange sections for different rail sections and various lengths of wheelbase and wheel diameter, and presents an account of an experimental truck developed in Paris to confirm the conclusions reached theoretically as to the desirability of parallel axles. This part of the report is followed by a mathematical discussion of the action of various designs of radial-axle cars on curves, to show that the effect of the forces to which these cars are subjected is to compel one or both of the axles to take a non-radial position.—Eds.]

Companies which have tried radial axles but have given them up include properties in Basle and Geneva, Switzerland, Nuremburg, Germany, and Paris, France. Only two of the companies replying, that at Leeds, England, and Bordeaux, France, definitely prefer cars with radial axles.

The principal charges against parallel axles are greater rail and wheel wear and greater energy consumption on curves. Unfortunately, there is no evidence on rail wear, and that on wheel wear in the replies to the questionnaire is very inconclusive. Nuremburg and Paris estimate wheel wear at 25 per cent less with parallel than with radial axles, Bordeaux puts the figure at 30 per cent, while Leeds, one of the advocates of radial axles, finds no material difference in this respect.

Tests Made in Paris

There is also some difference in evidence on energy consumption, but on this point figures are available on four different types of equipment on the same property, namely the Paris Surface Lines. Four types of cars were tested, namely: type L, with four wheels, Cardan drive and no truck; type G, with a single truck and nose suspended motors; type B, with two maximum traction trucks, and a car with two radial axles, known as type A.B.M. The three cars first mentioned had parallel axles. The accompanying table gives the energy consumption, etc., of these cars operated without trailers. From this table it will be seen that car L has the lowest energy consumption per tonne-kilometer and lowest average tractive effort per tonne, and that in kilowatt hours per tonne-kilometer the radial axle car showed the greatest energy consumption. Tests were also made with the same cars hauling trailers and they finished in the same order as before. Still another test was made with the type G car, equipped first with parallel and then with radial axles. The radial axles were connected by a lever and springs in various ways and also were operated without any such guides, but in no combination was the energy consumption so low as when the axles were kept permanently in a parallel position.

In conclusion, then, where the wheelbase does not exceed one-fifth of the minimum curve radius, parallel axles appear more desirable. With a minimum curve radius of from 59 to 66 ft. cars up to 33 ft. to 36 ft. in length are practicable. Where such cars do not weigh more than 44,000 lb. they can be carried on four wheels, yet not exceed the desirable limit of 11,000 lb. (5 metric tons) per wheel. For heavier cars, as well as for high-speed interurban service, double trucks are necessary. In either case, full spring-supported motors, with braking on the armature shafts, should be used, as on the type L car in Paris.

TABLE II—TESTS ON PARIS SURFACE LINES WITH DIFFERENT TYPES OF EQUIPMENT

	Type L, Parallel, Axles without Truck	Type G, Parallel Axles with Truck	Type B, Two Max. traction Trucks	Type ABM, Radial Axles
Weight during test, kg	13,150	15,200	16,750	13,380
Wheelbase, meters	3.6	3.6	1.51	3.8
Kw.-hr. per car km	0.361	0.433	0.521	0.459
Watt hours per tonne-km	27.5	28.5	31.15	34.1
Tractive effort in kg	132.6	159.2	191.7	169.1
Average tractive effort per tonne	10.09	10.48	11.45	12.55

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Railway Weather Bureau Aids Snow Fighting

Third Avenue Railway successfully operates a department to forecast storms. Finds it valuable in maintenance

DEMONSTRATION that a private weather bureau can be an invaluable aid to street railway operation, has been obtained during the past four years by officials of the Third Avenue Railway System, New York City. The bureau was started with a cheap aneroid barometer. A vane was rigged up on the top of the company's building. Next a box showing the main and intermediate points of the compass was located in the office of the transportation department. This was hooked with the weather vane by an eight-sector commutator, so that as the weather vane rotated it flashed lights designated as North, South, East, West, etc. From the bureau's inception, accurate observations have been kept every hour during every snow storm. They consisted of barometer and thermometer readings and data as to the direction of the wind.

According to Mr. Thompson, it took only two or three storms to demonstrate clearly that they usually travel in about the same direction, and that changes of wind bring about the same effect each time. There are exceptions, however, in the nature of freak disturbances to which the United States Weather Bureau has given the name of "dumb-bell storms."

In these incidents, two storms are traveling parallel so that the low pressure areas are overlapping from time to time. In such circumstances the observer is likely to be misled by the strange antics of the barometer. Among all the storms, which have been studied by the Third Avenue Railway's bureau, however, there have been only three that did not run true to form.

Observations made during four years show that whenever there is a snow storm, the barometer indicates when the center of it is approaching the locality where observations are being made. The bureau, by means of its weather vane and barometer, in connection with the daily maps issued by the United States Weather Bureau, which show low and high pressure areas in the country and their degree, is able to tell whether or not New York is in the path of the center of a storm. This is one of the outstanding advantages of the bureau and one that has saved the Third Avenue system not only a considerable monetary loss but nervous strain on the part of operating heads.

Experience of the Third Avenue shows that when the barometer begins to rise and the wind to shift from northeast toward the east and the southeast, it is invariably followed by a warm spell. If the barometer keeps on falling and the wind shifts from the northeast to the east, and on to the southeast, this is almost an infallible sign of rain. Under either of these conditions it is perfectly safe to leave a considerable fall of snow on the ground because rain or the warm spell will do the work of many men in removing snow.

On the other hand, if the wind is backing from the northeast to north and on to the northwest, if any snow is left on the ground it is certain to freeze. This means that the railway must clean up as quickly and thoroughly as possible after the storm because whatever is left on the ground will present a serious problem.

Probably the principal advantage of the company's bureau is that it enables transportation heads to predict the duration of a storm. When this is known, a comprehensive idea is gained in the matter of handling equipment. If the storm is to be short, and equipment has not suffered any severe strain, it appears safe to keep it on the road, so that a clean-up can be made as soon as it stops snowing. If, on the other hand, there are indications of a disturbance of considerable length, equipment is pulled in and measures taken to put it in shape for a long job.

The Bureau Has Proved Its Worth

When the bureau was first started it was accepted with a measure of skepticism, yet, according to officials, there has not been a storm in the last two or three years that has not resulted in many calls from other departments for information as to the state of the barometer.

The barometer, however, is not accepted as infallible; the experts have recourse to the U. S. Weather Bureau's predictions, which are furnished twice daily for publication in the press. This information is made up for the morning papers at 10 o'clock in the evening and at 10 a.m. the following day for the afternoon papers. When there is a change in the data, the government bureau in New York has always helped the Third Avenue weather department, by giving revised predictions.

As soon as means will permit it is proposed to add to the equipment an instrument to measure the velocity of the wind. This will be of great assistance in foretelling the probability of drifts.

Up to date the bureau equipment has cost less than $300, and its installation has resulted in a great improvement in service during and after snow storms. There also has been an appreciable saving in maintenance costs.

A Popular Street Car!

CONSTRUCTION has just been completed of two experimental cars of similar types for the Pittsburgh Railways. These cars were designed with the object of improving service and providing greater attractiveness to the public. The company considers these cars an improvement of vital importance in meeting automobile competition. An article telling of the salient features and the innovations on these cars will appear in an early issue. Watch for it!

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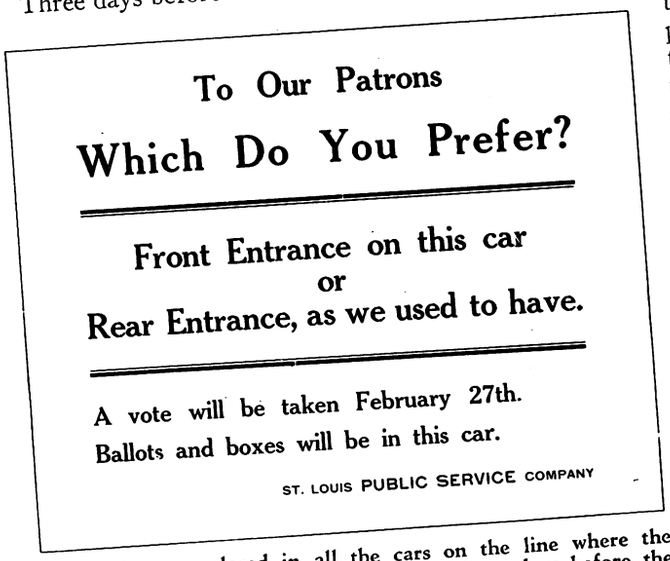
Advance Publicity Brings Large Vote

MUCH interest was shown in the recent balloting on a few lines of the St. Louis Public Service Company, St. Louis, Mo., to determine whether the rear entrance pay-as-you-enter system or the front entrance pay-as-you-leave system was preferred. The final results showed that on 949 cars a total of 303,000 votes were cast, a number representing a comparatively high proportion of the riders. The interest was not confined, however, to the day of the vote. Newspapers published advance stories and comments, and many discussions were engaged in by employees and customers.

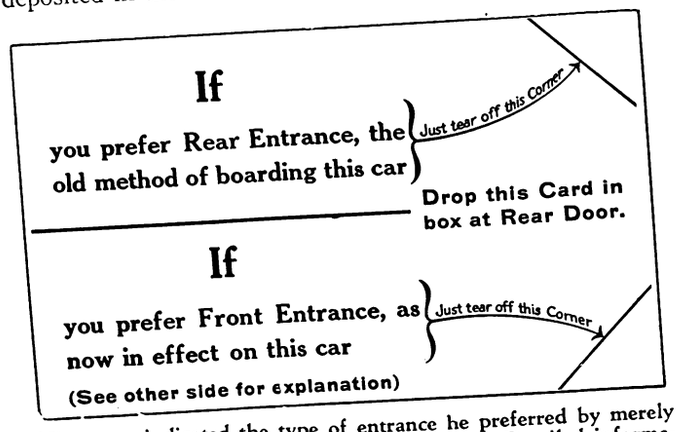
Three days before the vote was taken, brightly colored



This notice was placed in all the cars on the line where the entrance change was being considered, three days before the vote was taken

notices were posted in all the cars where the change was being considered. These notified the patrons when the vote was to be taken, and clearly stated the issue. On the day of the balloting, the notices were covered by new ones requesting that the riders vote on the question and giving instructions on how to secure the ballots and where to deposit them. The ballots, one of which is shown in an accompanying illustration, gave a full explanation of the two entrance systems and provided a convenient means to cast a vote.

When the patron boarded the car on the front end he was handed a ballot by the motorman and this was deposited in the ballot box at the rear door when he left the car. The final count showed 63 per cent in favor of the rear entrance, the system formerly used, and 37 per cent in favor of the front entrance. Plans were immediately made by the company to put the change into effect.



The voter indicated the type of entrance he preferred by merely tearing off the proper corner of the ballot. Detailed information was given on the opposite side

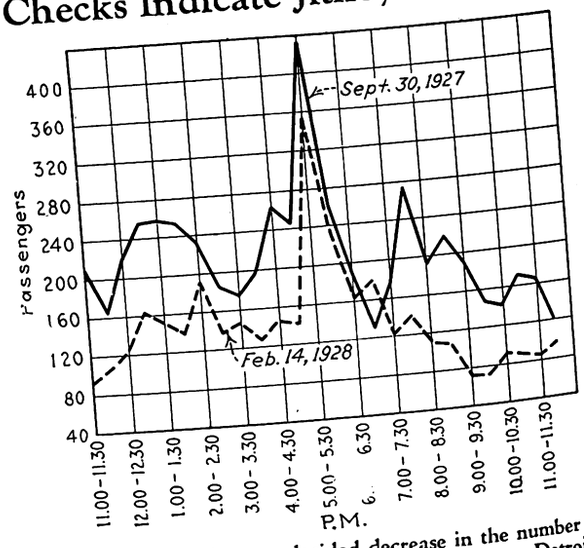
Surface Lines Shows Interesting Movie

"SAFE HIGHWAYS" is the subject of a new motion picture film produced by the Chicago Surface Lines for presentation in schools and before civic and community clubs and other non-theatrical audiences. This picture treats the entire traffic problem from the standpoint of safety. Since most traffic accidents result from the operation of automobiles, the picture undertakes to teach the automobile driver and the general public safe practices. The scenes in the picture illustrate the danger of pulling away from the parking space at the curb without looking to see what is coming, passing a street car on the wrong side, passing a loading street car where there is no loading zone, trying to beat the automatic signal by crossing the street on the yellow light and several other dangerous practices.

The pedestrian sees the danger of alighting from a street car without looking, in walking back of the car into the opposite lane of traffic and in crossing the street without due caution. For the children there are scenes cautioning them against stepping into the street while traffic is passing, playing in the street or stealing a ride by hooking on behind a wagon or truck.

This is the fourth picture produced by the Chicago Surface Lines in the past three years. The experience with earlier pictures convinced the management that there is no better way to drive home a lesson.

Checks Indicate Jitney Decrease



The two curves indicate a decided decrease in the number of passengers carried by jitneys on Jefferson Avenue, Detroit

CHECKS made on Sept. 30, 1927, and Feb. 14, 1928, with respect to jitneys in service on Jefferson Avenue, Detroit, indicate a decided decrease both in the number of passengers carried and the corresponding number of jitneys in service. The checks, made by the traffic division of the Department of Street Railways, covered a thirteen-hour period, from 11 a.m. to 12 o'clock midnight and show passengers by half hours. It is believed that the decrease has been caused by the express trolley and local bus service instituted on Jefferson Avenue.

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Maintenance Methods *and* Devices

Keeping Motor Fields in Good Condition*

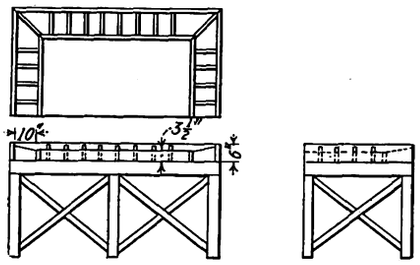
By R. T. Chiles
Master Mechanic Cumberland County Power & Light Company, Portland, Me.

CAREFUL attention to motor fields has been one of the most profitable maintenance practices of the Cumberland County Power & Light Company. During the year 1926 there was but one field failure for every 428,658 motor-miles operated. Of these failures 70 per cent occurred during February and March, when snow and rain increased the number of failures.

Cars are overhauled on an average of once in three years, or on a 125,000-car-mile basis. At this time motors are removed from the trucks and the fields are removed from the motor cases and sent to the field room, where they are tested, the insulation is examined and if found to be baked it is removed and new insulation is applied. The fields are then heated and submerged in a tank of air-drying P.&B. insulating paint, where they remain one hour and are then removed for drying. A second coat is applied with a brush, and this is allowed to dry, after which the terminals are cleaned carefully. After fields are put in the motor cases they are given another coat of paint. Lead wires are examined carefully to insure good connections and fields are tested for polarity and grounds before the armature is installed. The fields are also cleaned and painted every time it is necessary to remove an armature.

Work Bench With Material Racks

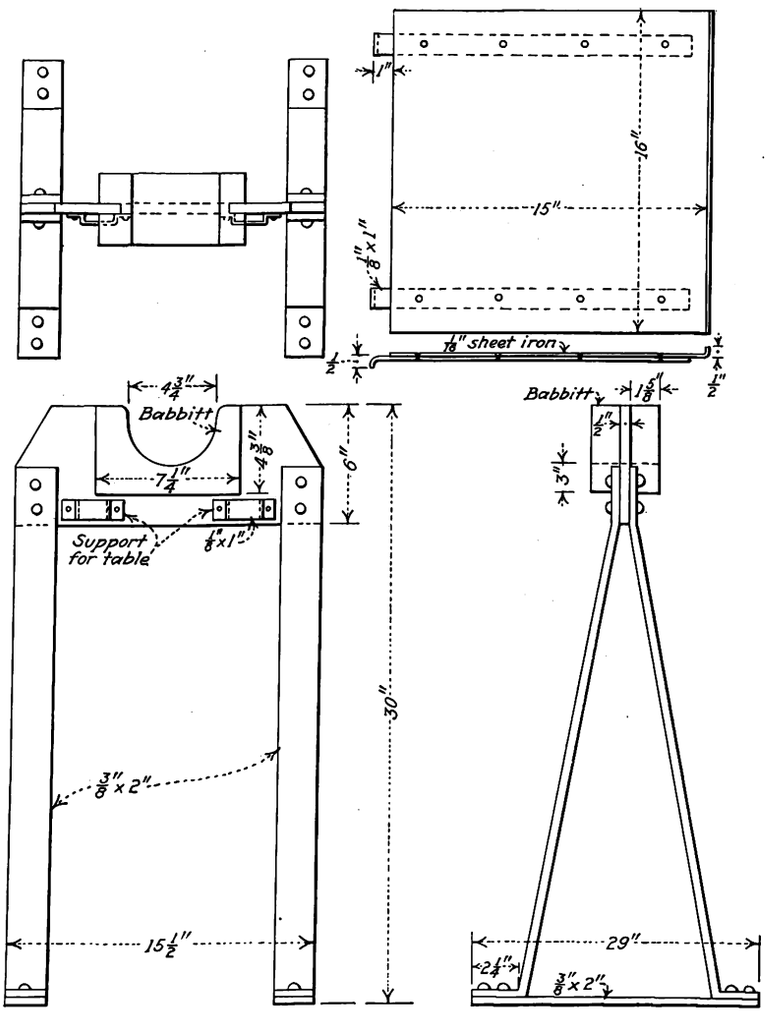
PRODUCTION has been increased and maintenance expense decreased by an improvement which has been added to the work benches in the shop of the New York & Harlem Railroad, New York City. This consists of a number of bins on top and around the sides of the bench. These bins are 6 in. high in back, 3½ in. high in front and 10 in. wide. They are made of ¾-in. lumber. The inside dimensions are of various sizes in order to accommodate the different sizes and shapes of material necessary for the repair work. These benches were flat previously and the material was scattered around on top, which resulted in some being lost. With the new arrangement the assorted material is stored in these bins and it is within easy reach of the mechanic. These bins have eliminated the loss of material and the workman's time in going for it.



Material racks added to bench increase production

Babbitted Bearing Armature Stands

BABBITTED bearings instead of rollers are used in the winding stands in the armature room of the New York, Westchester & Boston Railroad, Westchester, N. Y. These stands are of novel design. The uprights and bottom plates are made of ⅜x2-in. bar, riveted to a ½x6-in. plate at the top. The bearings are made of solid babbitt molded on the top plate. The shaft-bearing surface is 4¾x3¾ in. All parts are riveted with ½-in. rivets. Slight lubrication of the surface of the babbitt makes rotation of the armature easy. The top cross-



At left, armature stand with babbitted bearings. Above, at right, table for attaching to stand

*Submitted in Electric Railway Journal Prize Contest

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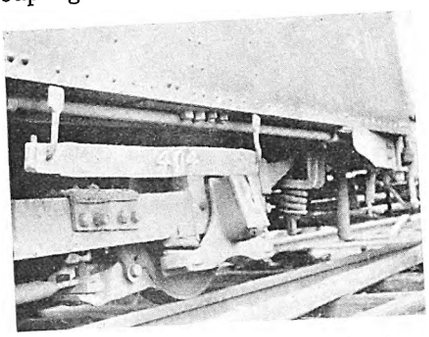
members have clips for the support of a small table made of No. 16 sheet steel. The table is supported by $\frac{1}{8}$x1-in. brackets.

Numbering Drawbars by Welding

POSSIBILITY of serious service interruption always is present unless the proper coupling facilities are avaliable. The Jamaica Central Railways, Jamaica, N. Y., operates several types of cars, on all of which drawbars are carried on hooks fastened to the side sill. The coupling link centers are all alike

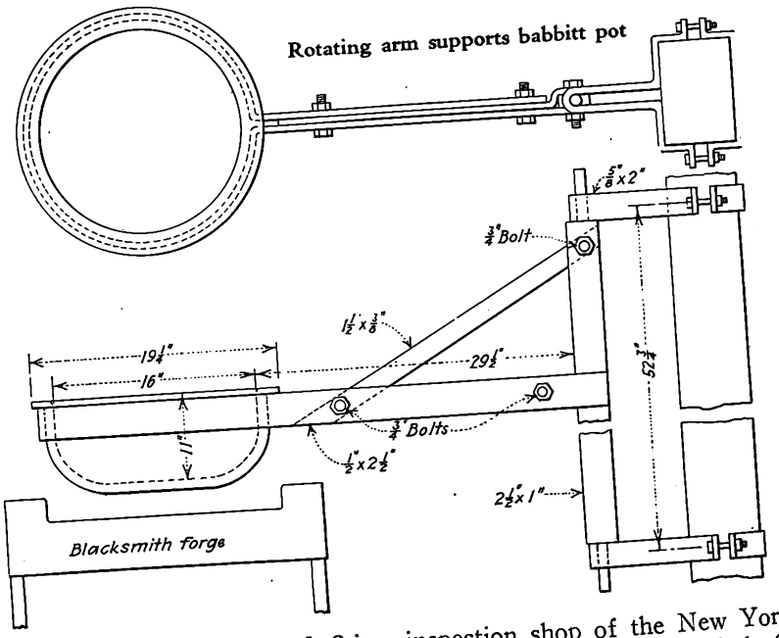


Car numbers are welded on the drawbars

but the shape is slightly different for each type of car. Trouble has been experienced in the past with drawbars being interchanged on the various types of cars. To eliminate this trouble the number of the car to which it belongs is welded on the flat surface of the drawbar. The cars are checked daily and if any drawbars have been interchanged it is evident. Some of these cars operate over tracks belonging to other companies, and when drawbars have gone astray it has been difficult to distinguish them. With the new idea it is very easy to identify them.

Blacksmith Forge Heats Babbitt

WHERE the shop floor space is limited the forging and babbitting work can be performed in the same section. The Manhattan & Queens Traction Corporation, Long Island City, N. Y., has found this arrangement economical. Here the babbitt is heated over the blacksmith fire. To accomplish this result and eliminate the handling of the babbitt heating pot it was necessary to design and build a special structure. This consists of a gaff 58¾ in. long and a boom 48¾ in. long, both being made of 1x2½-in. material. Each end of the gaff, for a length of 4 in., is



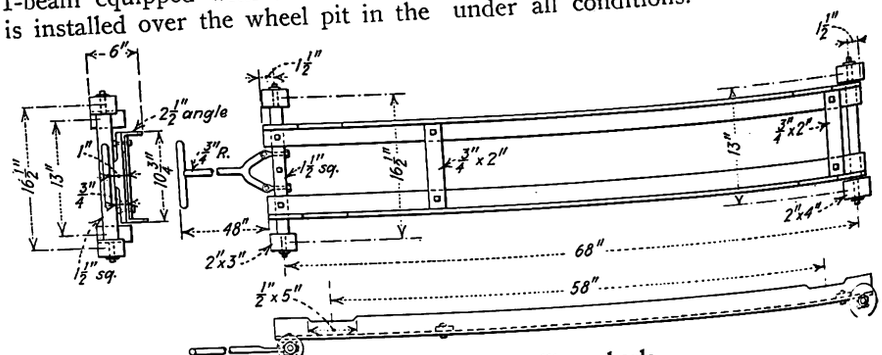
rounded and fits into two ⅝x2-in. brackets clamped to a column of the building. This arrangement provides for a 180-deg. circular movement of the boom. The end of the boom is clamped around the babbitt pot under the flange. A 1½x⅜-in. diagonal brace fastened to the boom and gaff provides additional strength and prevents flexure of the parts. All parts are bolted together with ¾-in. bolts. With this arrangement the babbitt pot can be swung over the fire or rotated out of the way when not required.

Hand Truck to Transport Wheels

SOME railway systems have one or more inspection houses at some distance from the shop and it is found advantageous to change wheels during the inspection period. Very often the carhouses are not equipped with a traveling crane or telpher for handling the wheels from their place of storage to the point of installation. Some means must be provided for transporting the wheels. A short I-beam equipped with a chain hoist is installed over the wheel pit in the inspection shop of the New York & Harlem Railroad, New York City. Due to the layout of the building the wheels are stored at some distance from the hoist. When the carhouse is filled with cars some means must be provided for transporting the wheels along the floor to the wheel pit. This is done by a hand truck designed and constructed in the shop for this purpose. It consists of two 2½-in. angles, 71 in. long, spaced 10¾ in. apart and tied together with ¾x2-in. straps. Each angle is provided with two ½x5-in. notches spaced 58 in. centers for the support of the wheels during transportation.

A 1½-in. square axle in the rear end of these angles carries two 4x2-in. steel wheels spaced on 13-in. centers. The front end has a 1x2-in. bolster to which is fastened a 1½-in. square axle. They are held together with a ¾-in. king pin. This axle is equipped with two 3x2-in. steel wheels spaced 16½ in. centers. The height of the truck above the floor is 6 in. A 4-ft. handle made from ¾-in. round iron provides for easy movement.

This truck has been found very serviceable and provides a means for handling both the old and new wheels under all conditions.



Convenient truck for handling wheels

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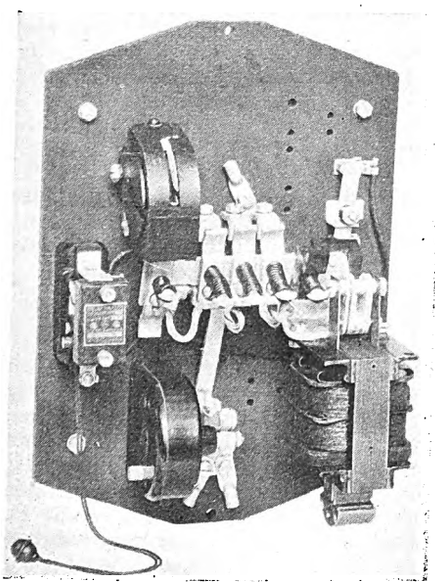
New Equipment Available

Starters for D.-C. Motors

DIRECT - CURRENT motor starters for general purposes, forming a complete new line, have been introduced by the General Electric Company, Schenectady, N. Y. These starters are designed to provide definite-time acceleration for constant and adjustable-speed motors, and are divided into five types bearing the designations CR-4065, CR-4066, CR-4166, CR-4068 and CR-4168. A principal advantage is that, despite a reduction in size, the number of accelerating points has been increased. An improved appearance is secured by the use of drawn-shell inclosing cases.

The CR-4065 starter is a constant-speed type for general purpose appli-

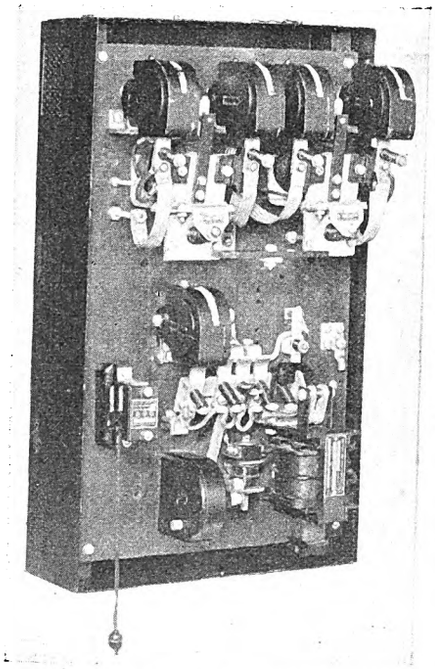


Typical starter with cover removed

cations, and the CR-4066 is similar with the addition of dynamic braking. The CR-4166 is an adjustable-speed type with dynamic braking and full-field features. The CR-4068 is a constant-speed type, reversing, with dynamic braking. The CR-4168 is an adjustable-speed type, reversing, with dynamic braking and full-field features.

The cover of the inclosing case hooks over two pins at the top of the box, the bottom being held by a screw. This is in accordance with the Underwriters' requirements.

On those starters with dynamic braking a small relay with its contacts connected in the pick-up circuit prevents the solenoid from being re-energized until the motor has come

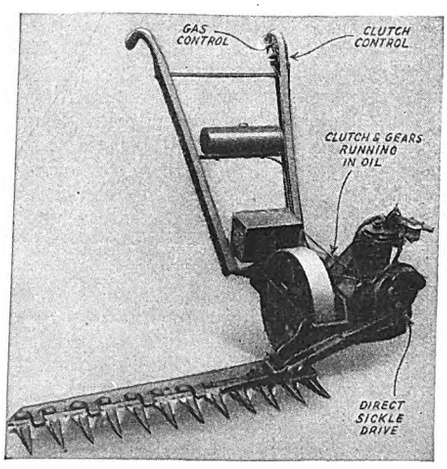


Mechanism of starter removed from case

to rest. Thermal overload protection is obtained by means of single-coil relays able to stand high in-rush currents. These relays operate only in extreme conditions and serve as a warning to the operator that the motor or wiring requires attention.

Gasoline Engine-Driven Mower

FOR CUTTING high grass and weeds along the right-of-way of electric railways a gasoline engine-driven mowing machine has been placed on the market by the Rawls Manufacturing Company, Streator, Ill. A four-cycle engine furnishes power for propelling and operating



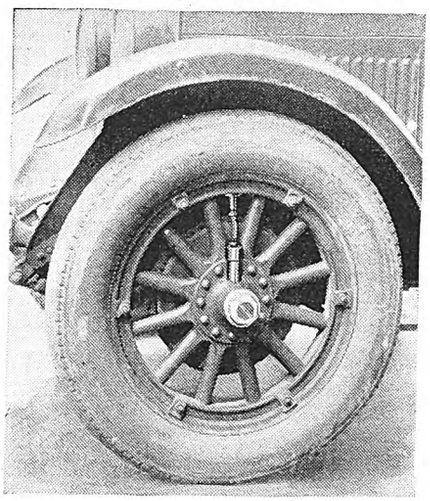
New type engine-driven mowing machine

the cutter bar of the machine. Particular attention has been given to balancing so that the mower can be guided easily around any obstruction. It can be tilted for cutting up or down slopes and as it pivots on one wheel sharp corners can be turned easily.

The mower is propelled by a direct-gear traction-drive to the wheel with the cutter bar connected directly to a power take-off by means of pitman rod and balanced crank pin.

Automatic Tire Inflator

PREDETERMINED tire pressure may be maintained by an automatic tire-pressure inflator announced by the Yellow Jack-It Manufacturing Company, Chicago, Ill. The de-



New device for automatically maintaining tire pressure

vice is built on the air-compressor principle and requires no adjustments or oiling.

The construction includes a hardened cam mounted on the wheel spindle underneath the hub plate; a roller mounted on the end of a piston which follows the cam, and suitable connection to the tire valve. When the roller reaches the cam peak the air compression stroke is completed. At each revolution of the wheel air is forced past the intake valve into the inner tube. A check valve is provided which is set for the air pressure specified for the tire. When the pressure is up to the required amount the check valve functions and carries off the surplus air through the exhaust.

Proper tire pressure is maintained while the vehicle is in motion, and when the vehicle stops if there is a loss of air due to a slow leak or puncture which is insufficient to cause a flat tire the automatic inflator begins to function as soon as the car starts.

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Association Activities

Midwest Association Announces Program

PRACTICALLY all phases of electric railway operation will be discussed at the annual meeting of the Midwest Electric Railway Association, June 4-6, in the Baltimore Hotel, Kansas City, Mo. According to the program, registration will begin at 9 o'clock Monday morning and the regular sessions at 10 a.m. Following is the three-day program of the association, as announced:

MONDAY, JUNE 4, 1928

BEGINNING 10 A.M.

"Welcome to Kansas City," by Hon. Albert I. Beach, mayor of Kansas City, Mo.

Response, by Powell C. Groner, president Kansas City Public Service Company.

"The City Manager Plan," by Hon. H. F. McElroy, city manager Kansas City, Mo.

"Present-Day Conditions and Tendencies of the Electric Railways," by R. P. Woods, president Kansas City, Clay County & St. Joseph Railroad.

Round-table Luncheons: Transportation Section. Mechanical Section.

AFTERNOON SESSION

BEGINNING 2:15 P.M.

"Modern Track Construction," by A. E. Harvey, superintendent of construction Kansas City Public Service Company.

"Power Conservation," by L. E. Gould, president Economy Electric Devices Company, Chicago, Ill.

"Co-ordinated Car and Bus Operation," by D. A. Scanlon, general superintendent Northern Ohio Traction Company, Akron, Ohio.

"Treadle Operation and Its Effect on One-Man Service," by R. L. Frehse, sales engineer National Pneumatic Company, Chicago, Ill.

Annual Banquet—Baltimore Hotel, beginning 7 p.m.

TUESDAY, JUNE 5, 1928

BEGINNING 10 A.M.

"Relation of Equipment to Car Speeds," by R. L. Hermann, transportation division manager Westinghouse Electric & Manufacturing Company, St. Louis, Mo.

"Electric Railway Advertising," by E. E. Soules, manager publicity department Illinois Traction System, Peoria, Ill.

"Organized Safety and the Electric Railways," by F. C. Lynch, director Kansas City Safety Council.

Luncheon and inspection trip to shops of Kansas City Public Service Company.

AFTERNOON SESSION

BEGINNING 2:15 P.M.

"Are You Abreast of the Times?" by J. C. Thirlwall, transportation engineer General Electric Company, Schenectady, N. Y.

"Modern Car Construction," by J. M. Bosenbury, equipment engineer Illinois Power & Light Company, Chicago, Ill.

"Worm-Drive Truck Development," by William Bonn, sales representative Timken-Detroit Axle Company, Chicago, Ill.

WEDNESDAY, JUNE 6, 1928

BEGINNING 9:30 A.M.

Reports of committees.
Unfinished business.
New Business.
Election and installation of officers.

Bus trip inspection of rehabilitation work in progress in Kansas City Public Service Company property.

The service betterment committee of the American Electric Railway Transportation and Traffic Association will hold a meeting in conjunction with the Midwest Association at 10 a.m. on Monday, June 4.

Ladies are specially invited to attend the meeting. Ample provision has been made for their entertainment. Representatives of supply companies and local electric railways will provide the convention entertainment, as follows:

MONDAY, JUNE 4

Bridge luncheon for ladies, Blue Hills Country Club.

Banquet. Entertainment and dancing.

TUESDAY, JUNE 5

Luncheon for ladies, Kansas City Athletic Club, followed by Gray Line sightseeing tour of Kansas City.

Reception for visiting delegates, Baltimore Hotel.

Carnival Dance, roof garden, Kansas City Athletic Club.

WEDNESDAY, JUNE 6

Al Fresco Picnic, Motor Country Club. Buses leave Baltimore Hotel for 11-mile trip to club where there will be a steak picnic, golf, bridge and dancing.

Selfishness and Misunderstanding Are Hindering Safety Work*

BY E. K. EASTHAM
Safety Director St. Louis Public Service Company

PREVENTION of traffic accidents is difficult because it is inter-related with so many diverse and otherwise unrelated interests and factors, some important and others not, yet all considered vitally important. This diversity is the essential difference between the prevention of traffic accidents and the prevention of industrial accidents. Within factories the management has a large measure of control and influence. It is a comparatively simple matter to get their own employees together in groups and sell them on accident prevention. Accidents in their own plants have a personal application, and for this reason the employees are willing to listen and discuss plans to remove dangers.

It is about equally simple for the management of a transportation system to secure a large measure of care on the part of its employees in handling street cars or driving buses. The requirements to produce those results are: first, complete honesty on the part of the management—that is, conducting a safety campaign without ulterior design and with a complete willingness to do its part; second, to have a well-organized plant and one under capable leadership, and third, to give the safety leader the position in the organization he deserves.

The safety department should be independent and in a position to make its recommendations and argue them through to a final conclusion before the impartial tribunal of the general manager, for the reason that accident prevention is a plain duty owed by every public or quasi-public utility to its employees and to the public at large.

PUBLIC UTILITY MEN SHOULD BE SPOKESMEN OF THEIR PATRONS

The best means of reaching the general public in matters of accident prevention is a local safety council, where such is available, because it is a disinterested organization in which the public has confidence. Next comes my conviction that greater educational results can be achieved with the children than with any other group. Then I would urge that public utility men become more and more the spokesmen of their patrons, the great mass which seldom has an opportunity to make known its wishes. Be their spokesman, put your influence behind measures designed to give the pedestrians an even break with the drivers of automobiles. Help the street car passenger to get on and off safely by insisting that other vehicles be required to stop back of the street car when it is receiving or discharging passengers. By all means, be represented at every gathering where matters of public or traffic safety are to be discussed or decided, and don't be afraid to stand up and be counted. Automobile associations are always there in force. Shall we be too busy in our offices or too penny wise to make our own force felt, to make the rights and safety of our patrons respected?

In the complexity of the problem lies the difficulty. We are met first by the fact that inextricably interwoven with the accident problem is the whole ques-

**Abstract of a paper presented before the Electric Railway and Public Utilities session of the Central States Safety Congress, held at Kansas City, Mo., April 23-26, 1928.*

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tion of traffic in general; that the flow of all kinds of traffic—pedestrian, motor vehicle, freight, street car, bus, delivery, mail—is the life of any community. In seeking a broad plan we encounter the perplexing details of parking, of one-way streets, of police control, of automatic signals, of safety zones, of street-widening projects, of staggered loads for peak periods, of the routing of through traffic, of boulevard stops, of rapid transit and all the rest of the "57" multiplied varieties of suggested remedies, panaceas and cure-alls.

Selfishness Is Crux of Problem

The main trouble encountered when a real traffic expert starts out to bring order out of chaos, to prepare a comprehensive plan for the solution of traffic problems, is that he at once runs up against a more or less impregnable wall of opposition based 90 per cent on selfishness and 10 per cent on misunderstanding. The 10 per cent of misunderstanding can be corrected by a campaign of education, but the 90 per cent of selfishness is the crux and core of the whole problem. We have the very common spectacle of merchants objecting to no-parking ordinances because they fear it will drive some trade away. They fail to realize that in urging the use of the already overcrowded streets for the storage of dead vehicles they are helping to strangle the free movement of traffic which is the blood of the community business life. They further fail to realize that in catering to the automobile trade exclusively, they are placing serious obstacles before the vast bulk of their trade which uses street cars, buses and other vehicles of public conveyance.

Besides the selfish merchant we have the politician, whose main thought concerns itself with votes and who is swayed much more by any local interest he believes controls votes than by any consideration for the community good and safety as a whole. We have the individual in countless forms and manifestations who brays at every regulation which he believes encroaches on his free-born American right to do as he pleases without reference to the rights of the other fellow. We have those real estate men, those property owners who object to well-thought-out zoning projects. We have local and territorial improvement and business associations who object to any comprehensive plan of betterment which they think will bring more advantage to other sections than to theirs. We have the automobile associations which from time to time oppose safety measures and regulations because some liability, some duty, some regulation, is sought to be imposed on the drivers of motor vehicles commensurate with the hazards brought into being solely by the motor vehicle.

Accidents Are Rarely Brought Home to Us

Offhand, one would think that the instinct of self-preservation would operate as a powerful check to these other forms of selfishness where any matter directly affecting safety of life and limb was involved. It does not act as a check because of the widely diffused character of traffic accidents. The total of deaths, injuries and property damage is staggering, yet in the immensity and complexity of city life it is seldom that any of these deaths or serious injuries are brought home to us.

Inter-related as it is, the boundaries of accident prevention become co-extensive with man's every effort to substitute some measure of humanitarianism and of altruism for an undisputed reign of selfishness. Every effort made in any right cause will indirectly bring closer to fruition the cause of accident prevention. Every friend cheered, every injustice righted, every vote against governmental corruption, every effort against business trickery, every helping hand extended to those less fortunate, brings nearer the day when the causes of accidents will cease.

COMING MEETINGS OF *Electric Railway and Allied Associations*

May 28-31 — National Association Purchasing Agents, annual convention and exhibit, American Royal Building, Kansas City, Mo.

June 4-6—Midwest Electric Railway Association, Hotel Baltimore, Kansas City, Mo.

June 4-8—National Electric Light Association, Atlantic City, N. J.

June 6-8—Canadian Electric Railway Association, annual convention and exhibit, Toronto, Canada.

June 12-13—American Wood Preservers' Association, Chattanooga, Tenn.

June 14-15—New York Electric Railway Association, Half Moon Hotel, Coney Island, N. Y.

June 20-27 — American Railway Association, Div. 5—Mechanical, annual convention and exhibit, Atlantic City, N. J.

June 21-22 — American Railway Association, Motor Transport Division, Atlantic City, N. J.

June 21-22 — Wisconsin Utilities Association, Accounting Section, Hotel Pfister, Milwaukee, Wis.

June 28-29—Central Electric Railway Association, Cedar Point, Ohio.

July 8-12—Public Utilities Advertising Association and International Advertising Exposition, Detroit, Mich.

July 13—A.E.R.A. Executive Committee on Yacht "Florida," New York, N. Y.

July 18-20—American Society of Civil Engineers, annual convention, Buffalo, N. Y.

July 19-21—Pacific Claim Agents' Association, annual convention, San Diego, Cal.

July 25-27—Electric Railway Association of Equipment Men, Southern Properties, Cincinnati, Ohio.

July 27-28—Central Electric Railway Accountants' Association, Detroit, Mich.

Aug. 16-17 — Wisconsin Utilities Association, Transportation Section, Sheboygan, Wis.

SEPT. 22-28, 1928

American Electric Railway Association, 47th annual convention and exhibit, Cleveland, Ohio.

Middle Atlantic Equipment Men Organize

ELECTRIC railway equipment men anxious to further improve their methods and practices, believing that intercourse between several properties in the same general locality is one of the best methods to accomplish this, met in Baltimore, Md., on May 16, 1928, and formed the Association of Electric Railway Equipment Men of the Middle Atlantic States.

Those present were C. O. Brooks, master mechanic Scranton Railway, Scranton, Pa.; D. E. Frame, master mechanic Delaware Electric Power Company, Wilmington, Del.; R. H. Dalgleish, chief engineer Capital Traction Company, Washington, D. C.; E. L. Green, master mechanic York Railways, York, Pa.; C. E. Keefer, master mechanic Altoona & Logan Valley Electric Company, Altoona, Pa.; E. L. Kelly, chief engineer Newport News & Hampton Railway, Hampton, Va.; W. H. McCarty, master mechanic Capital Traction Company, Washington, D. C.; J. A. Mellor, master mechanic Washington, Baltimore & Annapolis Railroad, Odenton, Md.; A. F. Rexroth, master mechanic Harrisburg Railways, Harrisburg, Pa.; R. D. Voshall, superintendent of equipment Washington Railway & Electric Company, Washington, D. C.; A. T. Clark, superintendent rolling stock and shops United Railways & Electric Company of Baltimore, Md., and H. A. Leonhauser, assistant superintendent rolling stock and shops United Railways & Electric Company of Baltimore, Md.

After discussion of the need and desire for forming an association of this character a constitution and by-laws were presented and adopted. A paper was read by Mr. Voshall on maintenance of street railway motors. After the paper was read, a lively discussion of many of its interesting features was engaged in.

After luncheon an inspection of the shops of the United Railways & Electric Company was made. The subject of comparison of performance of each company by "pull-ins" or "failures" was gone into very thoroughly and finally it was decided to use the basis of "pull-ins" for comparison.

It was decided to have the next meeting in November at Hampton, Va., the Newport News & Hampton Railway to be the host.

The following officers were elected: President, A. T. Clark; vice-president, E. L. Green; secretary-treasurer, W. H. McCarty; directors—for one year, A. F. Rexroth; for two years, E. L. Kelly; for three years, D. E. Frame.

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New Englanders Banquet at Boston

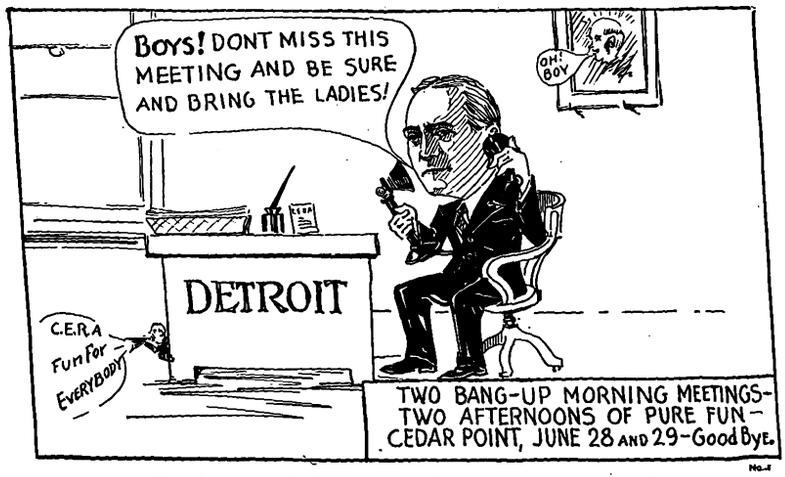
FOUR HUNDRED members and guests of the New England Street Railway Club celebrated the 28th annual banquet of the organization on Thursday of this week at the Copley-Plaza Hotel, Boston, the speakers being Lieutenant-Governor Frank G. Allen o Massachusetts; Robert B. Stearns, retiring president; Walter C. Slade, vice-president United Electric Railways, Providence, R. I.; president-elect Honorable Ralph S. Bauer, Mayor of Lynn, Mass., and T. A. Kenney, vice-president Hodenpyl, Hardy & Company, New York. Alonzo R. Williams, general manager United Electric Railways, Providence, was toastmaster.

Lieutenant-Governor Allen spoke optimistically regarding the future of New England industry, pointing out that whereas heavy losses have been encountered in certain fields within the last few years, the industries of the Northeast are gaining in diversity and magnitude. Mayor Bauer urged transportation men to get rid of the inferiority complex in their business and to emphasize the extent to which the prosperity of the modern city depends on railroad and railway lines as the only practicable means of handling mass transportation.

Mr. Kenney commended the work of the public utilities information bureaus of the country in striving to acquaint the public with the facts about the utility industry and paid a warm tribute to the New England Bureau in particular for its well-directed activities under S. T. MacQuarrie. He sounded a warning note against the tendency of the government to encroach further and further upon business. He briefly called attention to the increased economic inconveniences and risks which the electric railway industry faces as a result of the Interstate Commerce Commission's attitude upon depreciation accounting and certain provisions of the Transportation Act bearing upon taxation. Ordinary electric railways should be distinguished from common carriers doing a considerable interstate freight business, the speaker said, and provision should be made under which the railways can be taxed in some proportion to their net earnings, thus enabling poor years to be offset by good ones.

The following additional officers were elected: Vice-Presidents, H. M. Steward, Boston, Mass.; J. K. Punderford, New Haven, Conn.; J. B. Crawford, Concord, N. H.; D. G. Clark, Burlington, Vt.; Edward M. Graham, Bangor, Me.; Alonzo R. Williams, Providence, R. I.; Secretary, John W. Belling, Boston; Treasurer, Fred F. Stockwell, Cambridge, Mass., and Executive Committee, George E. Haggas, Portland, Me.; Howard F. Whitney, Worcester, Mass.; C. B. Pierce, New Bedford, Mass.; H. S. Day, Providence, R. I.; George Acker, Boston, Mass.; A. J. Boardman and J. P. Alexander, Boston. Frank B. Walker was chairman of the banquet committee.

C.E.R.A. Promises Rousing Summer Meeting



"Fun for everybody," says C.E.R.A. program committee

EXTREME efforts are being made by the program and hotel and arrangements committees to make the summer meeting of the Central Electric Railway Association at Cedar Point, Iowa, Thursday and Friday, June 28 and 29, an outstanding event, according to W. S. Rodgers, president. There will be two morning business sessions filled with discussions of interesting topics pertaining to the industry.

The entertainment features will be ample for the entire family. In addition a wide variety of sports is available at Cedar Point.

The accompanying cartoon is a sample of those being sent out to members, stressing "Fun for Everybody" and calling attention to various features of the program.

American Association News

Purchases and Stores and Stores Accounting

JOINT meetings of the committee on purchases and stores of the Engineering Association and the committee on stores accounting of the Accountants' Association were held at Association headquarters, New York, on May 18 and 19. Aside from the regular work of the committees, considerable time was given to the discussion and planning of an elaborate convention program and the following tentative program was adopted:

MONDAY, SEPT. 24—2:30 P.M. TO 5 P.M.

Address of welcome by R. H. Dalgleish, president A.E.R.E.A.

"Standard Packages," by W. E. Scott.

"Purchasing from the Manufacturers' Standpoint," by B. W. Forkner.

"Inactive Stock," by A. S. Duncan.

"Relation of Purchasing to the Stores Department," by A. L. Fischer.

"Handling Supplies for Buses," by W. S. Stackpole.

TUESDAY, SEPT. 25—LUNCHEON CONFERENCE

"What Would Be a Fair Measure of the Cost of Handling Materials and Supplies," by C. A. Harris.

WEDNESDAY, SEPT. 26

Joint annual report by the chairman.

"The Cost of Controlling the Investment in Material and Supplies and the Distribution of That Cost," by W. P. McArdle.

"Pricing Problems," by R. A. Weston.

It is planned to include in the committee's exhibit a delinescope picturization of storekeeping practices and exhibits bearing on the question of unit piling, standard packages and other storeroom methods.

Members of the committees attending the meetings were J. Y. Bayliss, R. A. Weston, W. J. Walker, W. S. Stackpole, A. L. Fischer, A. S. Duncan, E. A. Murphy, J. Fleming, W. E. Scott, B. W. Forkner, A. A. Ordway, W. P. McArdle and C. A. Harris.

Preliminary Announcement on Brady Medals

AUTHORIZATION by Nicholas F. Brady to award the Anthony N. Brady Memorial Medals for the year ended Dec. 31, 1927, "for achievement in safety and sanitation by electric railway organizations of the United States" is announced by the American Museum of Safety. As in the past, the award will be made jointly under the auspices of the American Electric Railway Association and the American Museum of Safety.

The committee on conditions, composed of men from within the industry, has been giving all factors entering into this competition additional careful study in the light of the results of last year. Definite decision on the conditions covering the contest for the year 1927 will be reached at an early date. It is hoped to have the printed conditions forwarded to all contestants early in June.

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News of the Industry

Fare Stay in New York

Interborough case to be heard by Supreme Court on Oct. 2. City not required to post bond

The Supreme Court of the United States on May 21 granted the stay sought by the city of New York and the Transit Commission and prevented the 7-cent fare from going into effect on the Interborough lines in New York City at least until the case is reviewed in the high court next fall. Under the ruling of the Supreme Court the injunction granted by the lower court, which would prevent any interference with the collection of a 7-cent fare, cannot become operative until after the case is retried on appeal.

CHIEF JUSTICE TAFT READ THE ORDER

Chief Justice Taft announced the decision of the court briefly, saying that after considering the application for the stay of the injunction pending an appeal to the Supreme Court it was ordered that the stay be granted and that the injunction not become operative until after that appeal had been heard. The court also announced that it would hear the appeal of the city on Tuesday, Oct. 2.

The order of the court in the case was as follows:

Upon consideration of the motion of the appellants for a stay of the order granting an interlocutory injunction, from which this appeal is taken, and for the advancement of this cause for an early hearing, it is ordered that the operating of the order of the District Court, May 10, 1928, granting an interlocutory injunction in this cause be stayed and remain inoperative pending the hearing and determination by this court of the present appeal, and that this cause be advanced and set down for hearing in this court on Oct. 2, 1928.

The supreme bench heard the arguments on the city's petition for a stay of the injunction granted by the statutory court on May 14, when Charles L. Craig and Samual Untermyer laid their case before the court and William L. Ransom argued against the petition.

CONTENTION OF CITY COUNSEL

Nothing in the decision indicated whether the counter proposal of the counsel for the city and commission to file a stipulation in the lower courts should be carried out. Counsel had offered to file a stipulation which would permit the $5,700,000 in preferentials which it is estimated will be due and payable to the city this year, to be set aside in a special account so that, if the courts in the final decision should grant the 7-cent fare, the company might be reimbursed for any losses it might have suffered by the maintenance of the 5-cent fare while the case is being tried.

Counsel contended that the city has no power to post the bond required and that there was no way under the law by which the city's money could be offered as security to indemnify the company for its losses.

In their arguments, Mr. Untermyer and Mr. Craig stressed the injustice of the terms imposed by the statutory court and the impossibility of meeting them. Mr. Ransom, in his reply, characterized the decision rendered by the statutory court as "the most clarifying document on the transit situation that had ever been written."

$15,000 and No More Responsibility in Paris

The Council of Paris, Ill., has relieved the Central Illinois Traction Company, subsidiary of the Central Illinois Public Service Company, of further responsibility and obligation under its 50-year franchise, dated Aug. 1, 1910. A payment of $15,000 cash for the release was made by the company, which agreed to remove all poles, wires, tracks and ties, except those on Main Street.

30,000,000 Miles Without an Accident

5,441 men in employ of Chicago Surface Lines had spotless records for year recently ended. Beautiful trophy awarded by Mr. Richardson to Lincoln division men at banquet

MOTORMEN and conductors of the Chicago Surface Lines were the guests of honor of officials of the company at a banquet held in the Stevens Hotel, Chicago, May 4, in celebration of the fact that 5,441 employees did not have a single accident in service during the fiscal year ending Jan. 31, and that the total number of accidents was 12½ per cent less than the total in 1926. Guy A. Richardson, vice-president and general manager, pointed out that the motormen among the no-accident group had operated their cars for a total of 30,000,000 car-miles without an accident of any kind.

Approximately 70 per cent of the motormen and 54 per cent of the conductors who had no accidents, he declared, had been in the company's service for more than ten years. In extolling the records made by the men, Mr. Richardson urged the same strict requirements of mental and physical capacity for automobile drivers as must be met by Surface Lines employees.

Each man was presented with a bronze insignia to be worn on the lapel of his uniform during the year. One of the features of the celebration was the awarding of a handsome trophy in the form of a sterling silver model ¼₈ of the actual size of the latest type Surface Lines car to the Lincoln Avenue car depot, which made the best accident prevention record on the system last year.

Mr. Richardson characterized the meeting as unusual in the annals of the Surface Lines. Indeed, it was. In the past the system of the company used in keeping accident records tended toward focusing attention on the few men who were in trouble rather than on the many who were satisfactorily performing their daily duties and formed the backbone of efficient and safe service. Beginning with 1927, this plan was changed with the avowed intention of being able properly to give credit where credit is due. Since a banquet hall large enough to serve the entire group was not obtainable, it became necessary to devise a plan for selection of as many as could be accommodated, so the group on the evening of May 3 was invited on the basis of seniority.

Mr. Richardson said the fact that approximately 60 per cent of the 5,441 clear accident record men have a service record in excess of ten years demonstrated conclusively that judgment and ability to operate cars successfully under the trying street conditions faced each day, came from years of experience in the school of hard knocks and that it could not be acquired overnight. In other words, successful operation in service such as that supplied by the Chicago Surface Lines depended on those who are devoting their lives to it rather

Farewell to the Wooden Car in Boston

THE last wooden car on the rapid transit lines of the Boston Elevated Railway, Boston, Mass., was retired from service on March 27, 1928. The wooden cars which have been retired have now been all replaced by steel cars, the last cars on the order for 100 having been received recently. The rapid transit lines have also placed in service the entire lot of 60 new steel cars ordered for the Dorchester rapid transit extension. Thus there are now in operation a total of 160 new steel rapid transit cars involving an investment of $3,700,000.

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than to the type that is here today and gone tomorrow.

An analysis of seniority of trainmen who have not had a chargeable accident during the year ending Jan. 31, 1928, showed:

	Total Number	More Than 25 Years	More Than 20 Years	More Than 15 Years	More Than 10 Years	Less Than 10 Years
Motormen	1,747	307	638	988	1,221	526
Per cent	100	17.57	36.52	56.55	69.89	30.11
Conductors	3,694	430	850	1,361	2,005	1,689
Per cent	100	11.64	23.01	36.84	54.28	45.72
Totals	5,441	737	1,488	2,249	3,126	2,215
Per cent	100	13.55	27.35	43.17	59.29	40.71

Last year cars of the company operated more than 136,000,000 car-miles. The number of 100 per cent motormen was 1,747, or approximately one-fourth of the total motormen. It can readily be computed then that this group of motormen operated on the streets of Chicago more than 30,000,000 car-miles in 1927 without accident—a performance, in Mr. Richardson's judgment, never equaled.

As indicated previously each no-accident trainman has been presented with a one-year safety button in bronze as a small token of the management's appreciation of his efforts in accident prevention. The Accident Prevention Advisory Council which, with Mr. Pasche, has charge of the plans and policies in this regard, advise that it is planning a different button for each additional year of freedom from accident, as follows:

One year	Bronze
Two years	Silver car on bronze
Three years	Solid silver
Four years	Gold car on silver
Fifth year	Solid gold button

The whole organization has been bending its energies to the reduction of accidents and for the last three or four years the need of accident prevention has been stressed more than ever before. As a result the accidents on the system last year were reduced 6,500 in number, or 12½ per cent, over the previous year. The total number of car-miles per accident last year was better than any year since 1923, and during that time there has been a 50 per cent increase in registered automobiles in Chicago. Incidentally there was an increase of 17 per cent in car-miles run per accident, comparing 1927 with 1926. Last year there were 5,700 fewer collisions with vehicles than during the previous year, in spite of an increase of 19,200 vehicles registered in Chicago than in 1926. The recession of that amount represented more than 18 per cent in that one class of accident, and was a further testimonial to the outstanding merit of the motormen. There was a reduction of 14 per cent in fatalities, of 27 per cent in collisions of cars and 65 per cent in those brushed from steps.

Alighting and boarding accidents dropped off 5½ per cent, a credit to the men on both ends of the car, but there was an increase of 36 per cent in persons thrown by quick starting and stopping—something the motormen were reminded by Mr. Richardson they should bear closely in mind as a type of addident that is running in the wrong direction. Mr. Richardson said:

The whole trend of train service operation last year was in the right direction in accident prevention, in courtesy and all those other attributes that spell service in the broad way that we mean it.

I am rather inclined to believe that a great many people outside of our industry are beginning to think in the terms of accident prevention, undoubtedly brought about by the systematic work that is being done in the schools, shops and businesses all over the nation. This is borne out by the reports of many electric railways for the past year showing a marked reduction in accidents over the previous year. Our aviator friends say the public are becoming air-minded. I think we might well say that they are becoming accident-minded. This added to concerted attention to the causes of accidents in our business and the effective work that you and the others in our organization have been doing has produced the excellent record of last year.

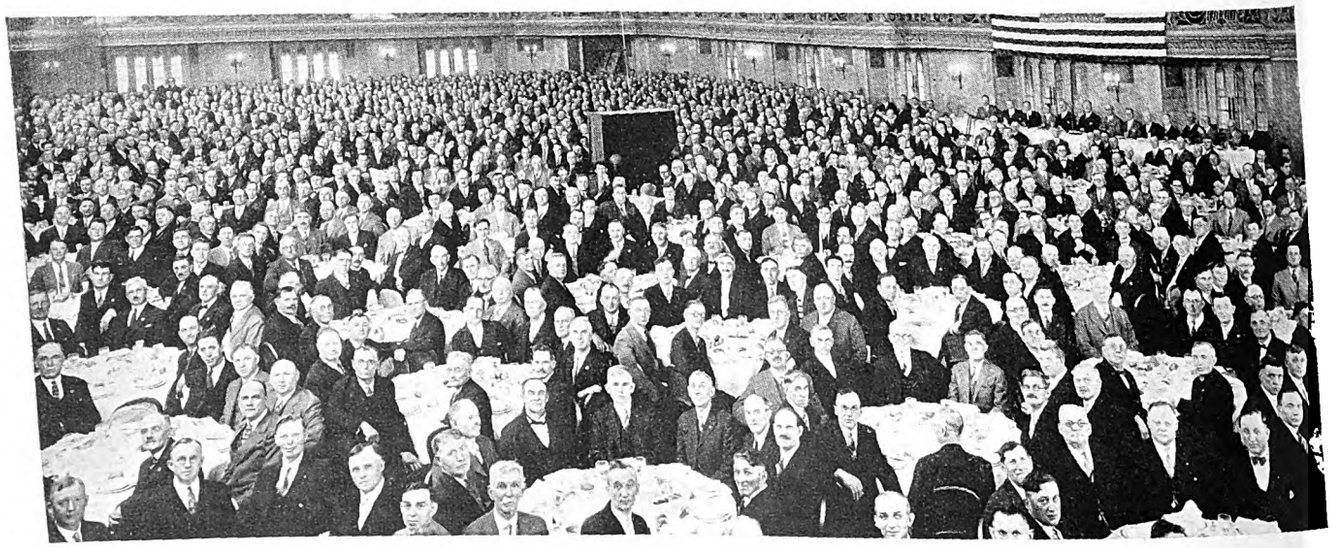
When we see the astounding figures compiled at the end of each year as to the fatalities and injuries caused by automobiles it makes us wonder whether the tide will ever turn and what, if anything, could cause it to do so. Until laws are passed in this state, as they have been in many states, making it necessary for all drivers of automobiles to pass a reasonable physical and metal test as to their ability to operate these high-speed, high-powered vehicles, it would seem that we may expect little along that line. You all know the strict requirements necessary to qualify you to perform the work of running cars on this system and I know you would think the management derelict in its duty if it permitted any man with a major physical or mental defect to operate its equipment over the busy streets of our city, yet men of this type are driving automobiles.

At the outset in our work of accident prevention we felt that if we could save a single life or major injury our efforts would be worth while. To have our own people killed and injured by being crushed between cars seemed an outstanding carelessness that should be completely eliminated. It may interest you to know that in 1927 none of our employees was killed by this form of accident while in 1923, when we started this campaign, four trainmen had been killed; one in 1924; three in 1925 and one in 1926. This would indicate that our endeavors along this line have not been in vain.

It is surprising how far-reaching accident prevention work is. At practically every meeting of our operating heads or of the staff many of the subjects relating to accident prevention are discussed. All of these discussions and conferences bring a better understanding of the problem we are facing and with the meetings of the safety committees and co-operation between all groups on the system we are beginning to show real results in this direction.

Many departments besides transportation are making enviable records. Their activities do not usually involve the public directly to the same extent as the train services do, but they prevent injury to themselves and to their fellow employees.

Only by good team work throughout the organization can we satisfactorily make progress in accident prevention or in any other constructive effort to improve the



5,441 trainmen of the Chicago Surface Lines were eligible for the accident prevention banquet at the Hotel Stevens on May 3, but it was possible to accommodate only a quarter of this number in the mammoth grand ball room

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operation and service, and I want you men gathered here tonight to know how much the management appreciates the whole-hearted support and co-operation it has had from the entire force. Your 100 per cent record in accident prevention work last year makes you the outstanding examples of efficient electric railway operators.

As a climax to his address Mr. Richardson gave the signal to unveil the silver speed trophy represented by a miniature modern Chicago Surface Lines car, awarding it to the Lincoln Avenue carhouse as the winner. Superintendent Hays of Lincoln, in receiving the award, expressed his gratitude and the gratitude of the men serving under him. In presenting the trophy to Mr. Hays, Mr. Richardson said:

For the past two years all depots have been engaged in friendly rivalry in the matter of accident prevention on a system of credit and debits worked out by the Advisory Council. The first year's award went to North Avenue, but little did they realize when they accepted their 1926 trophy that over to the east of them the members of another group of determined men had been grooming themselves for 1927 to the extent that they stepped into first place in the first month and while sorely pressed once or twice were never forced from that position throughout the year. Individual effort is essential as the base of any endeavor. This has been repeatedly brought out before this evening, but team work of the whole group making this effort is vital to any organization such as ours in producing a finished result. The best team work in 1927 in accident prevention was under Mr. Hays' and Mr. Zage's leadership at Lincoln. They finished first, while Lawndale and Blue Island under Mr. Maguire and Mr. Eigelsbach finished scarcely two points behind Lincoln.

The Advisory Council this year prepared a surprise for all of us in the trophy that is to be awarded for last year's accomplishment. They advise that this trophy is to be held by the depot winning it for the year following, and that when any depot has won it three times it will then remain at that depot permanently. I had heard vague rumors of what the trophy was to be but had no conception that the master silversmiths at Marshall Field's could produce anything so beautiful as this silver replica of our most modern type of street car.

Mr. Hays, I am proud to have the honor of awarding the accident prevention trophy for 1927 to you as the representative of your efficient team mates of the Lincoln carhouse.

Would Prevent Interference With Piedmont Extension

Counsel for the Piedmont & Northern Railway, Charlotte, N. C., has filed in the United States District Court at Greenville, a petition for an injunction against the Interstate Commerce Commission to prevent its interference with the company in extending its line from Spartanburg to Gastonia and from Charlotte to Winston-Salem. The petition asked that the court set aside and declare null and void the recent decision of the commission that the road cannot extend its line in the directions desired. In its decision the commission held that the proposed line was not a public necessity.

Columbus Legislation Under Fire

A request to veto legislation passed by the City Council of Columbus, Ohio, on May 14, making all streets with car tracks main thoroughfares, has been made of Mayor Thomas by the Columbus Automobile Club. The ordinance also raises the speed limit of street cars from 20 m.p.h., to 25 m.p.h. Mayor Thomas declared that he had not signed the legislation, but gave it his verbal approval.

These ordinances supplemented a previous ordinance passed on April 16, authorizing the Columbus Railway, Power & Light Company to adopt the skip-stop system. That ordinance, which became effective on May 16, has been accepted by C. C. Slater, general manager of the Columbus Railway, Power & Light Company, but will not be put into effect until the other two ordinances become effective. Mr. Slater said that it would be necessary to change car schedules, rearrange car stop signs and work out other plans before the company could comply with the ordinance. All the present car stop signs will be taken down repainted and then relocated nearer the center of the street where they will be more visible.

Passage of the stop-street ordinance was opposed by Councilman Worley.

Lower Fares on Pacific Electric Lines

Fare reductions on Los Angeles lines of the Pacific Electric Railway affecting regular riders between zones one and two, one and four, and also a reduction in local fares in the Hollywood territory, were authorized May 15 by the California Railroad Commission effective upon one day's notice by the company. The new fares are the result of an agreement between representatives of the city of Los Angeles and the Pacific Electric Railway reached in an informal conference with the Railroad Commission at San Francisco.

The order provides for the sale of tickets to regular riders at a 5-cent fare between zones one and two, in the form of a twenty-ride book, good for 60 days, and carrying full transfer privileges within those two zones. A new cash fare of 5 cents is made effective on the Hollywood Boulevard and Santa Monica Boulevard lines between Crescent Junction and Vermont Avenue. This fare carries full transfer privileges to intersecting lines and will provide a 5-cent local fare between the business and residential districts of the Hollywood territory. Regular riders in the West Hollywood and South Pasadena districts are given the benefit of a 10-cent fare to and from Los Angeles by purchase of a twenty-ride book, good for 60 days with full transfer privileges.

In announcing the new fares the commission stated that since April 7, 1928, when an order establishing a series of experimental fares for the Pacific Electric Railway System was handed down, a careful check has been made day by day. It has been represented to the commission that the fares between the first and second zones and between portions of the third and fourth were such that in view of competitive and other conditions, they would decrease rather than increase patronage and revenue to the company. Representatives of the city and the railway confirmed these results.

Bills Fail at Special Session of the Illinois Legislature

The railway bills presented in the special session of the Illinois General Assembly by the Chicago City Council have been shelved and there will be no legislation of the kind before the next regular session of the assembly in January, 1929.

The special session met on May 15 on the call of Governor Small to consider "Home Rule" and other bills enabling the City Council of Chicago to grant franchises to the railway system for a fixed period of more than 20 years. From the first there was a feeling that nothing could be accomplished at this session owing to the fact that Governor Small, who called it, had just been defeated for nomination in the Republican primary and Mayor Thompson, his political ally, had been rebuked by an overwhelming vote in Chicago against the Governor and the Mayor's whole slate.

In moving to postpone consideration of the bills indefinitely, Representative Elmer J. Schnackenberg, Chicago, declared that the special session "was born in uncertainty, clothed in mystery and viewed with suspicion by the press and the public."

It seemed likely that the General Assembly would complete its work before May 26 and adjourn after creating a special committee to study the situation in Chicago and report back to the next regular session of that body.

St. Louis Agreement Forwarded to Commission

The formal stipulation entered into by the executive committee of the St. Louis Public Service Company, St. Louis, Mo., the executive committee of the Local Amalgamated Association and the city of St. Louis, through City Counselor Muench, providing for arbitration of the wage dispute was formally forwarded to the Missouri Public Service Commission on May 21. The State body will decide the issues and fix a new rate of fare in St. Louis and St. Louis County sufficient to provide funds needed to pay any increase in wages granted to the workers.

In the meantime attorneys for the company and the union have prepared data for submission to the commission. Under the terms of the agreement between the company and the union the present wage scale and working agreement will continue in effect until the state commission hands down its decision.

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Hearings Continue on Chicago Elevated Increase

Efforts of the Chicago Rapid Transit Company to obtain a flat 10-cent fare and to abolish its present $1.25 weekly pass and three-for-a-quarter ticket rate received another set back on May 16 when the Illinois Commerce Commission continued the hearing on its application until Sept. 11. The initial hearing was held on April 26. Decision to postpone the hearings was in the form of an answer to the motion of John G. Drennan, assistant corporation counsel of Chicago, to exclude the valuation presented by the company on the ground that the railway based its demand for a fare increase on a valuation that was eight years old and consequently, erroneous. Mr. Drennan argued that the company must show present value, which he believed to be considerably higher. The reason given for the denial was that the commission was making an appraisal on its own account and, to exclude that presented by the elevated lines would prevent its introducing as evidence the results of its own inquiry.

Harry J. Dumbaugh, attorney for the company, declared that the railway would complete a new appraisal by June 12 and protested any further delay. He claimed that such delay meant a loss to the company of approximately $200,000 a month; that the company now was running behind at the rate of $7,000 a day at the present rates. He said a new valuation of the "L" properties could be made by the company's engineers within 30 days.

Reduced Wages Accepted by Gloversville Employees

Trainmen of the Fonda, Johnstown & Gloversville Railroad, Gloversville, N. Y., accepted a 6 per cent reduction in wages, effective May 1. The new scale is to continue in force for a period of six months, after which time the old scale will be restored. Before automobile and bus competition summer traffic on this railway amounted to very near capacity business. Now the summer traffic is considerably lighter than the winter traffic.

Passes Increase Business on Alliance Line

Extensive use of weekly passes over the entire division has increased total revenue approximately 8 per cent so far this year compared with corresponding months of 1927, according to officials of the Stark Electric Railroad, Alliance, Ohio. During four weeks of April, 1927, the Stark Electric issued 3,119 passes for $2,809. Reports for the four weeks of April, 1928, show that 4,119 passes were sold for $4,014, an increase of 1,000 passes and more than $1,200 in revenue.

The Stark Electric has a variety of passes in the cities it serves, between smaller communities and cities, and to shops and schools along the division. One of the most popular is the weekly pass in Alliance, sold for 70 cents. The increase in the use of the weekly passes has not affected Sunday all-day passes. Business in the Sunday pass shows a steady gain so far this year.

Taking Testimony in Ottawa

Hearings are being conducted before the Board of Railway Commissioners on the application of the Ottawa Electric Railway, Ottawa, Ont., for an 8-cent cash fare. The present fare is 5 cents. Testimony of Robert M. Feustel, expert engaged by the city of Ottawa, at the hearing on May 4, favored the railway cars as the only quick and efficient means of handling passenger traffic. He complimented the company on maintaining its car mileage despite the falling off in the number of car rides.

Pay of Shop Men in Cleveland Boosted

An increase of $85,000 a year in the shop payroll of the Cleveland Railway, Cleveland, Ohio, as a result of a new classification of positions and increases in pay, was announced recently by Joseph H. Alexander, president. A rise of a few cents an hour was awarded most of the shop workers, the highest being 7 cents an hour. The pay adjustments were made, according to Mr. Alexander, as a result of a change in the shop week from a 54-hour to a 44-hour basis. This amounted practically to a 20 per cent reduction in pay. The new rates are retroactive to May 1.

A 2-cents an hour increase was recently granted to trainmen and motor coach operators.

More Parleys in Poughkeepsie

The Common Council of Poughkeepsie, N. Y., has appointed a committee to meet with the highway committee of the Board of Supervisors, and the representatives of the Poughkeepsie City & Wappingers Falls Electric Railway to discuss the problem of removing the tracks of the railway in Market Street and in the South Road to the falls. The position of the company is that the rails cannot be removed unless, for instance, the line to Wappingers Falls is purchased by the County of Dutchess for the new state road. A representative of the city has explained that an agreement of this kind would not necessarily have any connection with the paving debt due the city, but expressed the belief that any agreement with the county may turn out to depend upon a settlement of the paving debt matter with the city. This spokesman said:

We strongly desire the removal of the tracks, we believe in the preservation of trees on the South Road—we think that buses would be better than trolley cars on the Wappingers and South Side lines—and we therefore urge that the city appoint a committee to see what can be done before it is too late.

Utility Inquiry May Aid States in Regulation, President Believes

President Coolidge believes that the Federal Trade Commission's investigation into the activities of the public utility companies may bring out facts which would call for legislation by Congress, although such information as the President has received so far with regard to the commission's inquiry makes it appear to him that the question is one for state action rather than for the federal government. This was stated officially on May 18. As expressed by the *United States Daily* President Coolidge's views are as follows:

But little information is in the President's possession relative to the investigation now being made by the Federal Trade Commission concerning power companies.

President Coolidge had talks more than a year ago with Professor Ripley of Harvard University, who had written several magazine articles regarding the organization of electric power concerns, and such thought as the President gave the subject at that time led the President to believe that the affair was entirely a matter of state action as distinguished from action by the federal government.

The investigation by the Federal Trade Commission now in progress may reveal perhaps in the President's opinion facts that will be helpful to state commissions in administering the powers for the regulation and control of electric power companies, and the commission may develop some facts that would call for national legislation.

Court Claims Waived for Omaha Franchise

So that there will be no interference in the negotiations concerning a new electric railway franchise to be voted upon next fall by the people of Omaha, Neb., all pending court claims and disputes regarding the present franchise of the Omaha & Council Bluffs Street Railway have by mutual consent been waived. This is in compliance with the suggestion of President Shannahan made to the City Commission. Mr. Shannahan told the Council that the company appreciated the willingness of the city to negotiate for a new franchise; that the company was anxious for a full discussion and exchange of opinion on all the provisions, and that it desired the public to be fully informed on all phases of the company's needs and the city's rights. If the voters grant a new franchise the company officials are willing to forego any rights that may exist to a permanent and perpetual franchise to operate cars in Omaha. At City Corporation Counsel Van Dusen's request, the company executed a written waiver of claims to franchise rights arising from operation of cars after May 22.

A ten-year lease on 6,300 sq.ft. of space in the Union State Bank Building, Omaha, was taken recently by the company and it will use the entire fifth floor and a part of the sixth. The lease becomes operative on June 1. The company has occupied its present quarters for 27 years.

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Cause for Pause in Cleveland

Officials of the Cleveland suburb of East Cleveland claimed at the fare arbitration hearings concluded during the week ended May 19 that they are getting too much service from the Cleveland Railway. They asserted that more service than East Clevelanders require is put on the Euclid Avenue line for the convenience of Cleveland riders, and they voiced objections to paying the cost of that part of the service which they say is unnecessary.

This was one of two principal arguments advanced by East Cleveland against paying a higher rate of fare than the Cleveland rate. The other main argument was based on alleged wasteful and inefficient routing of a number of Cleveland car lines. Such routing tends to make the Cleveland rate of fare higher than it really ought to be, through no fault of East Cleveland. For many years the Cleveland Council has refused to consider the rerouting of the car lines on a more efficient plan.

The arbitrators, Ed. Doty, Charles M. Buss and Charles Higley, have the right to fix the East Cleveland rate of fare for the next five years. Briefs will be submitted within ten days and a decision is expected shortly thereafter. The Cleveland Railway contends that the East Cleveland fare should be 3 cents higher than the rate in Cleveland proper.

Ten-Cent Rate in Lorain Rejected

A proposal to increase car rates in Lorain, Ohio, to 10 cents, was rejected May 15 by the streets and sidewalks committee of the City Council. The Lorain Street Railway offered the Council a 7-cent rate for one year and a 10-cent rate for the next five years. The present city fare is 5 cents.

The Council committee has proposed a 7-cent rate for five years but railway officials will not consider it, according to F. W. Coen, head of the Lake Shore Electric Railway.

Electric Railway Issue of "Safety"

The March-April, 1928, number of *Safety,* published by the American Museum of Safety, is the electric railway issue, containing a full discussion of the Anthony N. Brady awards. The issue contains 64 pages, with 30 illustrations.

Savannah Appeal Unopposed

An appeal by the Savannah Electric & Power Company, Savannah, Ga., for increased fares was heard unopposed recently by the Georgia Public Service Commission. The company asked for a straight 10-cent cash fare unit instead of the 7-cent fare now in effect and proposed to sell six tickets for 50 cents; twenty school tickets for $1 and 24 children's tickets for $1. The school tickets would be available only during school hours, while the children's tickets would be used only by children between the ages of six and twelve, inclusive. The present zone system of fares would be retained under the new schedule, while transfer would continue to be universal.

Officials of the company stated that the present 7-cent fare, established in 1920, does not yield a fair return on the investment and that a deficit of $1,765,701 had been accumulated during the period between 1921 and 1927.

"Let's Go" in Louisville

"Let's Go!" a six-page magazine published "Each Week for Everybody" by the Louisville Railway, Louisville, Ky., made its initial appearance with a Derby Day edition containing special information about the Derby, together with the schedule of railway service for Derby Day. Copies were distributed on the city cars and several thousand copies were sent to railroad stations and hotels and to the Louisville Convention and Publicity League for distribution to Derby Day visitors. The new publication has as its purpose the entertainment and information of the street car riding public.

A Philosopher on the Interurban

PROGRESS does not always mean a net gain for every one. Here is one effect of the automobile on my habits and convenience: For three years I was able to travel to and from my office and my farm in an interurban street car. I always had a seat and the roadbed was so smooth that I could read newspapers, magazines and books. In the two hours I spent on the car each day I was able to go through a vast amount of print.

Former patrons of the line drove to work in their own automobiles in increasing numbers each year. Then a bus line came into competition with the electric line. The income of the railway company was reduced to the vanishing point, and the line was discontinued.

The buses are dirty and riding in them is tortuous, so I am now compelled to drive. Traffic is so congested at the hours I am on the road that I have to give my entire attention to the task. I lose two hours of reading six days a week, and two hours of hard work are added to my day's grind. Further, the cost of transportation is at least $1.25 more each day and this covers only parking, gasoline, tires and oil.

Private cars, buses and electric railways are all admirable accessories to civilization, but until each has finally found its proper place some of us are actually worse off than we were twenty years ago.—William Feather in the Philadelphia *Public Ledger.*

Wage Plea in Fort Wayne Denied

Operators of the Indiana Service Corporation at Fort Wayne, Ind., have lost their plea for increased wages by action of the Public Service Commission in deciding the wage dispute in favor of the company. Members of the commission said they felt the employees were entitled to more pay, but had found that the company's earnings would not permit an increase now. The attitude of the employees and company in submitting the dispute to the commission for arbitration was commended by the commission. Employees wanted the scale of 41 cents to 50 cents an hour increased to 65 to 70 cents an hour.

Portland's Advertisements in Folder Form

Into a saddle-stitched folder 19x24 in. thirteen transportation problems as advertised in the newspapers of Portland, Ore., by the Portland Electric Power Company, are reproduced from a series dealing with the daily mass transportation of the city. From copy institutional in aim the succeeding messages cover the bus developments by the company, its safety record, "services" by the salesmen and arguments for the trolley versus the private car. The advertisements are in the nature of a justification for the faith of the 250,000 people who rely on the Portland Electric Power Company to take them to their destinations daily.

Board of Control Suggested at Kansas City, Kan.

An ordinance creating a board of control, to be composed of the entire board of city commissioners of Kansas City, Kan., and to have supervision of all street car and bus transportation within the city, has been prepared by the legal department at the request of Commissioner F. LeRoy Cooke.

It provides the board be empowered to make and enforce orders for necessary extensions and additions to the railway system and that the Kansas City Public Service Company be prohibited from making any changes without the consent of the board.

Powell C. Groner, president of the company, has pointed out that the company has no franchise and that it must route its cars so far as possible to comply with the transportation needs of the greatest number of riders.

Perpetual Franchise Hearing in Denver Set

The city of Denver, Col., through its attorney, Thomas H. Gibson, appeared before the United States Supreme Court on May 11 and asked that its case against the Denver Tramway, locketed with the Supreme Court on appeal, be put over. The court then named July 9 as the date for hearing the plea against lower court's ruling sustaining the claim of the railway to a perpetual franchise.

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Recommends Adoption of Rerouting Plan in Seattle

Immediate adoption of the rerouting plan proposed nearly two years ago by Clark R. Jackson, superintendent of public utilities, has been recommended by the Seattle Municipal Railway committee of the Municipal League, after a study of the railway system in Seattle, Wash., extending over several months. The Jackson plan calls for turning at Pike Street of Broadway, Eastlake and other cars from the north and east, which now make the Jackson Street loop. The committee declares that savings ranging between $300,000 and $400,000 annually could be effected by following this plan. When it was originally presented to Mayor Bertha K. Landes the plan was shelved after bitter opposition had been voiced by property owners in the older downtown section of the city.

D. W. Henderson, superintendent of railways, is opposed to the plan, which resulted, he said, when it was partly attempted two years ago, in a loss of revenue, although there was a saving in expenses.

The report outlines among the advantages of the Jackson line, the following: Fewer car hours; saving time of cars, men and power; release of many cars so that they could be made over into one-man cars, and shorter runs.

The Jackson plan of reducing service on First, Second and Third Avenues has been approved in principle by the Peter Witt report and by the report made by a representative of the Westinghouse Company, the committee adds. In view of the general approval given the plan, and the immediate needs of the system the committee recommends that the rerouting be put in effect in advance of such other changes as may be recommended later.

Bus Co-ordination in Florence

Four bus lines are now in operation by the municipal street railway system of Florence, Italy. These lines extend through those zones where tram lines do not reach. Gasoline buses formerly were used but the motive power has now been changed to current from storage batteries.

Electric Railways in Japan

The Imperial Government Railways of Japan spent approximately 12,016,119 yen (the yen is about 47 cents) for electrical equipment during 1927, by improving electric railway lines, extending generating facilities and building electric substations, according to a recent report. During the year, twelve locomotives and 89 tram cars were purchased from foreign countries.

There are 230 privately owned railways in Japan, comprising 2,917 miles. These railways are classified as follows: Steam, 1,317 miles; electric, 1,497 miles; steam and electric, 73 miles, gasoline, 30 miles.

Foreign News

Street Car Wins in Colombia

Narrow streets, rough pavements, public safety, and cost of installation were the factors which caused the Empresas Publicas Municipales, Medellin, Colombia, to decide to retain and improve the street railway system instead of substituting trackless trolleys.

The streets of Medellin are very narrow and are paved with rounded stones laid on top of the tamped earth. The Empresas, after due consideration of both methods of transportation, felt that its passengers would be more comfortable in street cars and also that, because of the narrow streets, a trolley confined to a given lane would be less dangerous to public life and property than the trackless trolleys.

The present street railway system of Medellin consists of eight lines, with two more projected, and its rolling stock consists of 34 Birney type safety cars with eight more on order. Within a year it is expected to increase the equipment to about 50 cars.

Railway Electrification in Silesia

Electrical operation has recently been started on the Breslau-Konigsvelt line, thus connecting the Silesian mountain railway, Gorlitz - Laban - Hirschberg-Konigszelt, to the provincial capital and completing the electrification of this system. The conversion started in 1911, but the work on the first portions could not be finished before the end of the war and on account of great difficulties had to be continued on small sections, each of which was eventually opened for public service. The completion of this electrification makes the Silesian railway system, which is 351 km. in total length, second in Germany to the Bavarian system only, both as to length and importance. It controls the main share of the tourist traffic in the Iser and Riesengebirge mountains as well as the Glatz mountain district of Silesia, and also provides for the extensive coal transport from the Lower Silesian colliery district.

Current for operating the railway system is derived from the Mittelsteine, county of Glatz, central station, owned by the state railway, where coal obtained in connection with clay working is used as fuel, at half the cost of ordinary locomotive coal. The current thus generated is supplied at a tension of 80,000 volts to various converter stations, where it is stepped down to 15,000 volts.

New Cars for Edinburgh

Expenditure of £31,000 for the purchase of new rolling stock has been approved by the Tramways Committee of Edinburgh, Scotland. Twelve new cars will be purchased soon, at an estimated cost of £1,800 each. The additional cars are required to meet increased traffic which is expected as a result of a substantial reduction in fares.

Bus Development in Germany

The German Post Office Department is one of the largest operators of motor buses in Germany. While the primary function of the department is to carry mail and packages, it finds there is economy in purchasing motor vehicles which can also transport passengers. On April 1, 1927, it had 1,504 bus routes in operation over a total length of 16,650 miles. The number of passengers carried during the first eleven months in 1926 was 23,100,000.

New Electric Railway Completed in Spain

Between Puertollano and Conquista, Spain, a new electric narrow-gage railway, 34 miles long, has been completed recently by the Sociedad Minera Penarroya. It forms an extension of the existing line between Penarroya and Puertollano, and is mainly intended for freight transport. Power is supplied from the steam-operated generating stations belonging to the company at Penarroya and Puertollano.

New Traffic Scheme for Manchester

Plans for the improvement of rapid passenger transit facilities in Manchester, England, and regions beyond, are being considered by the municipal authorities. Henry Mattinson, general manager and engineer of the Corporation Tramways, has suggested two comparatively short underground railways crossing the city at right angles, with an interchange station at the point of their intersection in the center of the city, and with interchange stations at all the main-line railway terminals. At their suburban ends these underground lines would come to the surface and form physical junctions with the existing steam suburban railways. To insure through running the suburban railways would have to be electrified.

Buses to Be Installed in Norway

Street car lines are to be gradually replaced by bus lines in Bergen, the second largest city in Norway, according to a recent decision of the Board of Aldermen of that city. Bergen has a population of about 100,000.

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Recent Bus Developments

Trolley Bus Application Made in Salt Lake City

The City Commission of Salt Lake City, Utah, has granted an amended franchise to the Utah Light & Traction Company which permits the operation of trolley buses over all its existing lines within the city. Application has been filed by the company with the Public Utilities Commission of Utah for permission to operate trolley buses specifically over what is known as its Fourth East car line.

If this permission is granted ten buses will be ordered, and it is anticipated that operation on this line will commence about July 15. The trolley buses on this line will be operated on Main Street from North Temple or South Temple to Seventh South Street, east to Fourth East Street, and south 21st South Street, in accordance with the franchise.

The proposed route is about 4 miles long and serves a district that is well built up. The new line is to be so routed that cars over it will traverse the heart of the business district to the State Capitol.

Cleveland Suburb to Have Buses

Authorization was given by the City Council of Cleveland, Ohio, recently for the Cleveland Railway to operate three coach lines in Rocky River village, a suburb 8 miles from the center of Cleveland and separated from Cleveland by the city of Lakewood. The original ordinance drawn in the Council specified a 10-cent fare with free transfers to city car lines in Lakewood. Street Railway Commissioner C. M. Ballou pointed out that this would simply add to the losses on the Lakewood lines. Accordingly the ordinance was amended to permit transfers between the bus lines but not between the buses and street cars.

At present no buses are available, but the company next month will have twelve which are now used in chartered school service.

Property in South Bend Sold

Operation of the South Bend Motor Bus Company by a group of five men, including two officials of the Chicago, South Bend & Northern Indiana Railway was taken over on May 15. The purchasers of the bus company's stock are R. R. Smith, receiver for the railway; George R. Green, general superintendent; Alfred E. Dietrich, New York City; A. L. Kitselman, Muncie, and A. H. Plumb, Emporia, Kan.

Directors in the company are R. R. Smith, president and treasurer; George R. Green, vice-president and secretary, and O. A. Small.

Arrangements are being made for the exchange of transfers between the bus and the electric railway lines.

Mr. Smith said that purchase of the bus line as individuals was based on the confidence in the future of South Bend and in the industrial expansion particularly in the western part of the city served by the bus line. The South Bend Motor Bus Company recently started service to the rapidly growing Belleville industrial district in the west part of the city.

Knoxville Company Rejects Demands of City

The City Council of Knoxville, Tenn., has passed a franchise granting the Knoxville Rapid Transit Company the right to operate nine bus lines as outlined by city planners. This ordinance must pass second reading and lie over seventeen days. The Rapid Transit Company then will ask the state commission for its approval of the franchise.

General Cates for the Knoxville Power & Light Company, in a prepared statement, outlined his company's offer to operate buses and to stand half the cost of Kingston pike track changes. He said:

> We are advised that the laws of the state prohibit unnecessary duplication of public utility operations and property, the result of which usually, if not always, comes to be borne by the consumers or patrons of the utilities.

In taking action the Council rejected Power-Light's reply to an ultimatium the Council bus committee placed before the company containing four demands: first, that the company relocate at its own expense its Kingston pike line, and maintain paving on the line after the city paved it; second, to change all other tracks as recommended in the Bartholomew transit survey; third, give free bus transfers, or vice versa; fourth, grant 5-cent fare to school children.

The company has explained at length the economic and other reasons which make it impossible for it to accede to these demands.

New Terms in Kansas City

Fares 15 cents on trunk lines under ordinance just passed. $563,450 deficit after more than two years of operation. Company's memorandum to Council an interesting study

THE Council of Kansas City, Mo., on the night of May 21 granted a new motor coach permit to the Kansas City Public Service Company by a vote of eight to one. The plan of operation that was approved was about as first submitted. It provides for five trunk lines, one crosstown line and six feeders. The trunk line fare is increased from 10 to 15 cents, but the crosstown fare remains at 10 cents.

Service Given Since 1925

The present bus system in Kansas City was installed in the fall of 1925 in response to an apparent public demand for such facilities. Service was begun under the terms of an ordinance dated April 7, 1925, and expiring June 7, 1928. It was recognized at the time that the institution charged with the responsibility of furnishing city-wide public transportation was the logical one to supply this additional service and should be required to co-ordinate bus service with its existing facilities. It was admitted that competition was unsound and undesirable, and if bus service was to be considered, that feeder and crosstown service was an essential which could best be supplied by the railway company.

Due to the uncertainty surrounding bus transportation, a short term was specified until experience under actual operating conditions should determine what was best for the company, the car and bus riders, and the city. The franchise provided that a seat be guaranteed every passenger and that pneumatic tires be used.

On March 30, 1928, the railway, through President Powell C. Groner, submitted to the Council a report and suggestions covering the present operation of buses and proposed rerouting and rearrangement of the system. This contained the operating figures for the two full years operation, 1926-1927, and estimates for the rearranged system based on experience and believed to be a very close forecast. Attention was called to the fact that the trend of expense will be upward, rather than downward, inasmuch as it might not be possible to renew a very favorable tire contract and that since buses have been in constant service their maintenance expense will increase.

It was suggested that on some lines night service be eliminated, and on some both night and non-rush day service to avoid expense out of all proportion to the patronage.

Service Only Where Logical

An effort was made in presenting the new proposal to lay out routes which would furnish service where logical or needed, and at the same time furnish revenues which would permit the system to exist. There are several places where service has been requested, but in the company's opinion these districts have not yet reached the point in population where bus service, unless on some sub-

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LINES OPERATED UNDER OLD FRANCHISE

TRUNK LINE SERVICE

Route	One Way Mileage
No. 1 Northeast line	5.01
No. 2 Benton-Linwood line	6.09
No. 3 Armour-Paseo line	6.60
No. 4 Warwick line	6.18
No. 5 Express line	7.15

FEEDER SERVICE

No. 6 Blue Valley line	3.00
No. 7 Leeds line	2.57
No. 8 Thirty-ninth Street line	5.48
No. 9 South Troost line	3.00
*No. 10 Forty-third Street line	1.23
*No. 11 Rosedale line	1.40

*These two lines have only been in operation a short time, No. 11 being on a 60-day trial by agreement.

Trunk lines—10-cent fare. Transfers to and from 39th Street crosstown line on payment of 5 cents.

Express line—25-cent fare; 19½-cent ticket fare good in non-rush period only. No transfers.

Feeder lines—10-cent fare with transfer to street cars.

Thirty-ninth Street line—10-cent fare with transfer to street cars. 5-cent transfer to intersecting bus lines.

Total number of buses owned:	
Double-deck	18
Large single-deck	40
Express buses	5
Small single-deck	6
Total	69
Average number of buses operated daily	60
Total investment in bus and garage equipment, exclusive of garages	$740,981

	1926	1927
Number passenger-miles operated in Missouri, excluding Rosedale and 43rd Street lines and special sight-seeing and chartered bus service	2,456,560	2,606,824

sidy basis, should be considered. The company said at that time:

These suggestions are submitted on the assumption that the Council will favor a continuation of bus service and that such continuance will serve the public interests and is desired by the people of the city. However, these suggestions should not in any manner be construed as an attempt to forecast the determination by the Council or the public as to whether or not bus service is desired after expiration of the present franchise in the coming June, or to preclude a full consideration of that question.

While the suggestions have been prepared after ample study and are believed to be sound, an actual test is necessary finally to determine that question. We therefore recommend that the rearranged system be given a fair trial for a reasonable period under some form of temporary or revocable license or permit, pending final determination.

Bus service in Kansas City falls into two classifications, namely trunk line service run direct from residential sections downtown, following the general course of railway lines and serving approximately the same territory; and feeder service, which consists of feeder and crosstown lines with transfer privileges, supplying transportation to outlying and unserved sections and connecting through paralleling street car lines.

As the company saw it, the operation of buses had demonstrated:

1. That Kansas City presents operating difficulties which bus and tire manufacturers have not experienced previously and which necessarily make operation more expensive than in flat, level cities.

2. That feeder lines entail a heavier loss than anticipated and that especially in non-rush and night hours these facilities are not needed nor used.

3. That trunk lines come much nearer to paying operating expenses than do the feeder lines.

4. That trunk line bus service creates very little new business and that at least 90 per cent of such patronage is taken from the street cars.

5. That, determined by carrying capacity and lack of short riding, 47th Street is about as far south as trunk line service should be operated.

6. That trunk line service guaranteeing a seat for every passenger and with pneumatic tires cannot be furnished for a 10-cent fare, except at an actual operating loss.

Operating Results

The entire bus system has been operated at a heavy loss since its inception. Statistics of revenue passengers and transfer passengers, together with average fare data, for both Missouri and Kansas, follow:

Year	Revenue Passengers	Transfer Passengers	Average Fare
1926	5,571,003	987,531	$0.0950
1927	5,219,703	691,390	0.0977

Note—The above includes 396,147 revenue and 405,626 transfer passengers carried on the Argentine, Kansas City, Kan., line, which was discontinued in November, 1926.

Operating expenses, revenues and deficit for all operations both Missouri and Kansas:

DEFICIT WITHOUT INTEREST CHARGES

Year	Revenues	Operating Expenses and Taxes	Depreciation	Deficit
1926	$627,356	$788,883	$88,154	$249,681
1927	594,073	646,324	86,674	138,925

DEFICIT WITH INTEREST CHARGES

Year	Revenues	Operating Expenses Taxes—Depreciation	Interest	Deficit
1926	$627,356	$877,038	$70,108	$319,790
1927	594,073	732,999	71,278	210,204

The total bus deficit from installation to Dec. 31, 1927, was $617,645.

Note—The large reduction in operating expenses in 1927 was largely due to a favorable tire contract which expires in 1928 and which there is no assurance of renewing.

These figures are for all operations both in Kansas and Missouri, including special bus service, advertising privileges, the Argentine, Kansas City, Kan., line discontinued in November, 1926, and the 43rd Street and south Rosedale lines added in December, 1927.

The losses incurred in furnishing bus service necessarily have to be made up by the railway lines, already faced with a 17 per cent decrease in revenue since 1922, and a decrease continuing at a rate of about 5 per cent per annum.

The comparison between 1922 and 1927 shows the seriousness of the situation facing the company:

Year	Revenue Passengers Carried	Per Cent Decrease	Passenger Receipts	Per Cent Decrease	Car-Miles 1,000 Passengers	Per Cent Increase Car Service
1922	136,076,541	.....	$10,213,928	.....	184	....
1927	113,542,693	16.56	8,484,611	16.93	214	16.3

The company suggested that these considerations were essential if a continuation of bus service at the expiration of the franchise seemed desirable:

1. That the bus system as a whole should be self-supporting.

2. That the trunk lines should be routed to give the most direct and the quickest service between the residential and business districts.

3. That feeder service should provide crosstown facilities and give transportation to sections remote from existing facilities where the population has grown sufficiently to justify it.

4. That night service, and in some cases non-rush hour service, should not be required on feeder lines.

5. That transportation service should be supplied where there is a need for transportation and not for the purpose of business centers or real estate developments.

6. That where street car facilities exist they should be used and duplicate service not required.

7. That the new franchise or permit should be for a period not exceeding five years.

8. That bus service should be kept elastic so as to meet requirements as they arise.

The fare suggested for trunk lines was 15 cents, with free transfers from trunk lines to intersecting crosstown street car lines north of 31st Street and a 5-cent transfer to all intersecting crosstown bus lines. For feeder lines it was suggested that the fare continue as at present at 10-cents with free transfers to intersecting or connecting street car lines or crosstown bus lines. The fare suggested for the 39th Street crosstown was 10 cents as at present, with free transfers to intersecting or connecting railway lines and with transfers to intersecting trunk lines upon payment of 5 cents.

The opinion was advanced by the company that 15 cents was not too much for a trunk line bus ride, based upon its cost and the service rendered. All the territory in which there is trunk-line bus service is served by railway lines and passengers have a choice of service.

It was contended by the company that transfers should not be given to or from trunk lines, except that the railway was prepared to give free transfers from trunk lines to intersecting crosstown car lines north of 31st Street. These trunk lines are in addition to existing facilities, as every district reached by them is served by car lines. They are operated to supply a demand for a high-class, seat-for-every passenger service,

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and cannot meet transfer requirements.

The idea was that feeder lines should feed primarily to car lines, not bus lines. Street cars are provided with sufficient capacity for all transferring passengers. There is no intent or purpose to supplant them or cripple them by taking passengers from their territory except where the fare secured makes it reasonable so to do.

The routes that were proposed were laid out to form insofar as possible to the principles outlined in the company's proposal and represented an effort to provide trunk line bus service through heavily populated territories, to supply a demand for luxury service and also by feeder and crosstown service to meet the transportation needs of the city.

Estimated Financial Results

The results of operation under the proposed plan were estimated for a year. On the trunk lines a 10 per cent decrease in riding was estimated as the result of an increased fare. The average revenues for the feeder lines were taken with the exception of 39th Street and South Troost, where no changes were made. Actual operating expenses were set up, based upon the present equipment and the kind to be placed upon each line.

From the foregoing it is apparent that the proposed plan will not make the bus system self supporting. This is due to the large amount of feeder mileage. It is very doubtful if for years these feeders will pay operating costs, and it is certain the losses incurred in this operation will never be recouped.

In elucidating the general principles covering bus operation which it advanced, the company held that the large losses resulting from feeder lines should be met, if possible, by such profits as the trunk lines on a proper fare basis can earn. Its idea was that it was illogical and unfair, and economically unsound, to require the railway patron to bear the loss of providing a preferred and more luxurious service to a comparatively small number. The demand from a considerable number for downtown transportation affording more luxury and guaranteeing a seat for every passenger should be met, but those availing themselves of such service should pay its cost. There was no equity in giving 3 per cent of the total passengers service at the expense of the 97 per cent who use street cars. In the face of constantly declining revenues it was apparent that if the street cars were continually called upon to carry the burden of bus losses, as well as non-paying car lines, the company's resources would be drained and its credit impaired. The result would inevitably be either decreased service or an increase in fare to offset the bus losses. On that account it was suggested feeder line fares remain as at present and that trunk line fares be increased to meet the cost of the service.

Bus Still in Its Infancy

The company believes bus transportation is still in its infancy and may be considered in the experimental stage, and expressed the opinion that the grant either be in the nature of revocable permits or for a period of not more than five years. This would give sufficient stability to justify the investment and not unduly tie the hands of the city or the company. It was suggested that before any definite franchise or operating agreements are entered into, the lines proposed by the company should be put to the test of actual experience for a short time, under a temporary or revocable form of license or permit.

Since the bus is ideally adapted by its very mobility to meet the shifts in conditions and population, the company recommended that, in the working out of this problem, the company be not "strait-jacketed" by hard and fast provisions as to routes and service which might shortly become entirely out of date, but that a reasonable latitude be allowed for shifting existing lines and extending or curtailing operation as conditions from time to time justify.

STATEMENT OF BUS OPERATION OF KANSAS CITY PUBLIC SERVICE COMPANY FROM INSTALLATION TO DEC. 31, 1927, MISSOURI OPERATIONS ONLY

	1925	1926	1927	Total to Dec. 31, 1927
Passenger revenue	$124,742	$570,963	$577,483	$1,273,189
Special bus revenue	751	4,601	14,102	19,455
Advertising	.....	.....	2,487	2,487
Total revenue	$125,494	$575,564	$594,073	$1,295,132
Maintenance and operating expense				
Way and structures	$6,068	$5,537	$9,366	$20,973
Equipment	33,195	197,908	177,340	408,444
Total maintenance	$39,264	$203,446	$186,707	$429,417
Conducting transportion	97,061	417,602	375,400	890,064
Traffic	4,715	4,853	4,262	13,831
General and miscellaneous	13,920	57,444	40,701	112,066
Injuries and damages	5,553	24,875	26,648	57,076
Total operating expense and maintenance	$160,515	$708,221	$633,719	$1,502,457
Depreciation	14,075	80,511	86,674	181,261
Taxes	2,071	12,265	12,604	26,941
Interest on investment (8 per cent of actual costs)	8,684	52,625	59,278	120,588
Garage rental	3,333	12,000	12,000	27,333
Total maintenance, operating taxes and fixed charges	$188,680	$865,624	$804,277	$1,858,582
Deficit	$63,186	$290,059	$210,204	$563,450

Interest charges are based on actual cost of buses and garage equipment only, and do not include the garage building and real estate or materials and supplies in stores.

ESTIMATE OF RESULTS UNDER OPERATION AS PROPOSED

No.		Miles	Revenues	Operating Expenses, Depreciation, Taxes and Interest	Profit or Deficit*
1.	Linwood-Benton	359,557	$147,274	$134,491	$12,782
2.	Armour-Paseo	335,294	140,219	125,415	14,803
3.	Warwick	456,553	123,451	133,582	*10,134
4.	Broadway	399,900	108,132	119,501	*11,360
5.	Chestnut	240,365	29,156	64,693	*35,538
6.	Van Brunt	201,770	24,474	54,307	*29,837
7.	39th Street	312,060	62,755	92,997	*30,242
8.	43rd Street	30,690	3,722	6,747	* 3,024
9.	South Troost	165,780	17,622	36,458	*18,835
10.	Oak Street	98,655	11,966	26,553	*14,586
11.	63rd Street	92,780	11,254	20,402	* 9,148
12.	South Rosedale	55,880	6,778	12,288	* 5,509
	Total	2,749,284	$686,810	$827,438	*$140,628

ESTIMATE OF RESULTS UNDER FULL EIGHTEEN-HOUR OPERATION

	Miles	Revenues	Operating Expenses, Depreciation, Taxes and Interest	Profit or Deficit*
All routes	2,911,450	$724,246	$902,969	*$178,723

$38,095 will be saved by reducing or eliminating service in the hours not used.

Compared with present operations:

	Miles
Present mileage yearly	2,606,824
Proposed mileage yearly	2,749,284
Deficit for 1927	$210,204
Deficit as estimated	$140,628
Deficit with eighteen-hour service on all lines	$178,723

New Plans in Springfield

Plans are being made by the Springfield Street Railway, Springfield, Mass., to use buses for private parties on special trips to Boston, New York, Providence, and other points. General Manager Flanders aims to go strenuously after this type of business with the early arrival of six new buses. Co-operation with the Worcester Consolidated Street Railway's bus division in this type of service is under consideration.

The Springfield company is also arranging for bus substitution on the Bucham Bend line.

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Financial *and* Corporate

Holding Company Issue Offered

Details of financing of Allied Power & Light Corporation under which Stevens & Wood-Hodenpyl, Hardy merge

Bonbright & Company, New York, is offering for subscription at $105 a share and accrued dividends from May 15 first preferred stock, $5 series, of no par value of the Allied Power & Light Corporation, each share of preferred being accompanied by one share of common. As noted in the ELECTRIC RAILWAY JOURNAL for May 12, page 785, Allied Power has contracted to acquire the business, assets and contracts of Hodenpyl, Hardy & Company, Inc., and the entire capital stock of Stevens & Wood, Inc., together with substantial stock interests in Commonwealth Power Corporation, Penn-Ohio Edison Company, Northern Ohio Power Company and other power and light systems.

The new company, either directly or through others, will act in a supervisory capacity for a number of power and light companies and will supply engineering, supervisory and financial assistance in connection with the development and operation of these companies and the construction of additions to their properties. It will take a financial interest in electric power and light and other companies through the purchase of their securities and will be prepared to supply the necessary capital and direction for the re-organization or consolidation of properties of the aforementioned character. It will also furnish engineering services and do general construction work.

The proceeds from the sale of the first preferred stock, together with the proceeds from the sale of preference stock and common stock, will be used to acquire interests previously described and for general corporate purposes.

Based on the earnings of Hodenpyl, Hardy & Company, Inc., for 1927, excluding dividends and interest received, and on the earnings of Stevens & Wood, Inc., for 1927, and adding dividends at the rates paid during the twelve months ending May 1, 1928, on stocks acquired by the corporation and interest on cash to be presently realized at the rate of 4½ per cent per annum, the annual net income after expenses and taxes is computed to be not less than $1,500,000, or more than twice the annual dividend requirement on the 150,000 shares of first preferred stock.

This first preferred stock will be followed by 100,000 shares of preference stock, $3 series, and 1,250,000 shares of common stock. Upon the completion of this financing the securities owned by the corporation, at present market prices, together with cash in its treasury, will amount to more than $25,000,000.

B. C. Cobb is chairman of the board of the new company and R. P. Stevens is the president. The board of directors is composed of B. C. Cobb, J. T. Harrington, vice-president of Penn-Ohio Edison Company; Jacob Hekma, vice-president of Commonwealth Power Corporation; Alfred L. Loomis, vice-president of Bonbright & Company, Inc.; Horace S. Scarritt, vice-president of Bonbright & Company, Inc.; Ray P. Stevens, president of Allied Power & Light Corporation, and Landon K. Thorne, president of Bonbright & Company, Inc.

Stock Increase Proposed at Philadelphia

A special meeting of the stockholders of the Philadelphia Rapid Transit Company, Philadelphia, Pa., will be held on June 18 for approval or disapproval of an increase of stock.

The proposed increase amounts to $5,000,000 preferred. City Council approved the issue on March 22, making the authorized capital $65,000,000.

Proceeds from the sale of $5,000,000 additional preferred will be used to relocate the Market Street subway tracks under City Hall, for a bus terminal on Locust Street and for a garage terminal near the northern end of the Broad Street subway.

Net of Detroit Municipal Lower

Net income of the Detroit Municipal Railway, Detroit, Mich., in April was $25,225 after taxes, charges and sinking fund had been deducted, comparing with $75,206 in April, 1927. For the first four months this year net income totaled $346,914 against $589,808 during a similar period the previous year.

Far from Being Moribund

THE electric railway systems in our cities remain vital necessities. They will for years to come, probably always, have a real place to fill. As the parking problem becomes more and more acute and the traffic congestion becomes greater we may expect the facilities of our street transportation systems to be subjected to an even greater strain. The tendency of an increasing number of people who work in the downtown districts to live as far as possible from the noise, the dirt and the confusion has unquestionably been a big factor in supplying traffic for the street cars. Transportation, under modern conditions, becomes all the time a more vital phase of our social and economic life. Assuredly the street car systems are far from being "moribund industries." — Nashville *Tennessean.*

Stock of Pennsylvania Company Offered

Reinhart & Bennet, New York, are offering at $47.50 for each share, to yield 7.37 per cent, cumulative preferred stock of the Lackawanna & Wyoming Valley Railroad. The par value is $50 per share. The company owns properties in Scranton and in Wilkesbarre, Pa., adjacent to the business centers of each city.

Another Power Property for Maryland Interurban

With the approval of the Public Service Commission the Chesapeake Bay Power Company, a subsidiary of the Washington, Baltimore & Annapolis Electric Railway, Baltimore, Md., has bought the Severna Company, which supplies current to Severna Park and other settlements in Anne Arundel County. With the acquisition of the Severna Company the Chesapeake Bay Power Company, controlling interest in which, as well as in the railroad, is now held by the Consolidated Gas, Electric Light & Power Company, Baltimore, now controls the electrical service for all of Anne Arundel County, Prince Georges County as far as Laurel and part of Montgomery County, under an agreement with the Potomac Electric Power Company, Washington, D. C.

Successor in British Columbia

As a result of the purchase of control of the British Columbia Electric Railway, Vancouver, B. C., Canada, by Holt, Gundy, Nesbitt, Thomson and Rothermere interests the name will be changed to British Columbia Power Corporation. Offering is being made in Canada and England by Wood, Gundy & Company and Nesbitt, Thomson & Company of 1,000,000 shares of class A stock of the new company at $60 a share, with bonus of one class B share for each four shares of A purchased. Class A shares are preferred as to dividends up to $2 a share. The directors include Sir Herbert Holt, Lord Rothermere, A. J. Nesbitt, J. H. Gundy, J. B. Woodyatt and S. Godin, Jr., representing the new interests. George Kidd of Vancouver will be president. The new company has a Canadian charter.

Segregation Before Delaware & Hudson Holders

Further progress in the plans for segregation of the activities of the Delaware & Hudson Company, New York, is indicated in the announcement that a special stockholders' meeting has been called for June 26.

The purpose of this meeting is to have stockholders authorize the board of managers, at any time not later than May 8, 1931, "to transfer to a new corporation to be organized under the railroad law of the state of New York any or all of the railroad properties

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and stock of subsidiary properties, boat lines, electric railways, motor bus lines and hotels except any stock interest in any company engaged in the anthracite industry."

The consideration, it is explained, will be "in cash or in stock, bonds or other securities of the purchasing company, as the managers may approve."

Thus, the D. & H. proposal is to make the present company a holding concern to own all stock issues of the railroad and anthracite company. By this means the railroad will obtain all legal powers of a railroad organized under the general railroad act of New York, whereas heretofore the D. & H. as a railroad has been limited to powers conferred by its charter of 1823 and subsequent amendatory acts.

More Passengers on Main Line

North Shore report for 1927 shows operating revenues increased over 1926 but Skokie Valley charges lowered net income. Freight business satisfactory

IN HIS message to the stockholders Britton I. Budd, president of the Chicago, North Shore & Milwaukee Railroad, Highwood, Ill., stated that the business of the company for the year 1927 was the largest in volume in the history of the railroad. Gross operating revenue of $7,829,592 compares with $7,568,361 for 1926. On this point he says:

Although the increase is not as great as was expected from the showing made in the early part of the year nevertheless there is reason for gratification in the fact that an increase was shown in a year when the general business of the country showed a falling off from that of the previous year.

The gross income after deducting operating expenses and taxes was $1,794,405 in 1927, a decrease of $19,886 from the previous year. The net income was $496,044 compared with $731,427 in 1926. These facts were also disclosed in the annual report for the year ended Dec. 31, 1927. The decrease in the net income was due to the increased fixed charges under a full year's operation of the Skokie Valley Route. In the previous year the interest charges on the capital invested in the new railroad were not charged against operation until the opening of the line in June, 1926.

Along the entire 23 miles of road new municipalities have been created or corporate limits of old-established towns and villages have been extended. Practically the entire territory adjacent to the railroad is now within the corporate limits of cities and villages. This suburban area, brought by the new line within a few minutes' ride of the business center of Chicago, embraces thousands of acres of highly desirable home sites, capable when fully settled of housing a large population. With the completion during the year of arrangements with the steam railroads for the interchange of cars, a profitable carload freight business is being developed.

At the beginning of the year passenger rates were on the basis of 3 cents a mile. After application to the Interstate Commerce Commission, authority was granted to increase interstate rates to 3.6 cents a mile in March, 1927. The intrastate rates remained at 3 cents a mile, but on a further application to the Interstate Commerce Commission an order was issued Dec. 12, 1927, directing the company to increase its intrastate rates to 3.6 cents a mile. This order was made effective on Jan. 15, 1928. The increase in interstate passenger rates placed the company in a position to participate in through interline passenger traffic with steam railroads. As a result arrangements were perfected through which travelers may purchase tickets at North Shore stations for any part of the United States, Canada and Mexico over any railroad.

Passenger traffic on the main line showed a substantial increase over the previous year, notwithstanding the less favorable business conditions and the fact that in the last four months the railroad had keen motor coach competition between Chicago and Milwaukee. The company carried on its main line a total of 10,865,823 revenue passengers in 1927, compared with 10,714,458 in 1926—a gain of 151,365. The increase was a steady growth as there were no outstanding occasions such as the Eucharistic Congress the year before. The total number of passengers carried on all rail and motor coach lines was 19,161,925, compared with 19,461,426 the previous year. The decrease of

INCOME ACCOUNT OF CHICAGO NORTH SHORE & MILWAUKEE RAILROAD

Operating revenue:		
Passenger and special car revenue	$6,008,148	
Freight and express revenue	1,388,051	
Miscellaneous revenue	433,392	
		$7,829,591
Operating expenses:		
Way and structures	$491,629	
Equipment	458,172	
Power	574,469	
Conducting transportation	2,539,792	
Traffic	284,327	
General and miscellaneous	1,392,475	
		5,740,867
Net revenue from railway operation		$2,088,724
Net auxiliary operating revenue		68,477
Net revenues from operations		$2,157,201
Taxes assignable to railway operation		420,084
Operating income		$1,737,116
Non-operating income		57,287
Gross income		$1,794,404
Deductions from gross income		1,298,360
Net income		$496,044
Statement of Surplus		
Surplus, Jan. 1, 1927		$919,507
Add sundry adjustments, net		163,043
		$1,082,551
Net income, Jan. 1 to Dec. 31, 1927	$496,044	
Profit on sale of real estate	333,597	
	$829,641	
Dividends paid	784,083	
		45,558
Surplus, Dec. 31, 1927		$1,128,109

Conspectus of Indexes for May, 1928

Compiled for Publication in ELECTRIC RAILWAY JOURNAL by

ALBERT S. RICHEY

Electric Railway Engineer, Worcester, Mass.

	Latest	Month Ago	Year Ago	Since War High	Since War Low
Street Railway Fares* 1913 = 4.84	May 1928 7.62	April 1928 7.61	May 1927 7.44	May 1928 7.62	May 1923 6.88
Electric Railway Materials* 1913 = 100	May 1928 140.4	April 1928 140.0	May 1927 144.2	Sept. 1920 247.5	Feb. 1928 139.5
Electric Railway Wages* 1913 = 100	May 1928 229.2	April 1928 228.8	May 1927 227.4	Sept. 1920 232	March 1923 206.8
Am. Elec. Ry. Assn. Construction Cost (Elec. Ry.) 1913 = 100	May 1928 202.7	April 1928 201.2	May 1927 201.0	July 1920 250.4	May 1922 167.4
Eng. News-Record Construction Cost (General) 1913 = 100	May 1928 210.0	April 1928 206.4	May 1927 206.8	June 1920 273.8	March 1922 162.0
U. S. Bur. Lab. Stat. Wholesale Commodities† 1926 = 100	April 1928 97.4	March 1928 96.0	April 1927 93.7		
Bradstreet Wholesale Commodities 1913 = 9.21	May 1 1928 13.44	Apr. 1 1928 13.42	May 1 1927 12.44	Feb. 1 1920 20.87	June 1 1921 10.62
U. S. Bur. Lab. Stat. Retail Food 1913 = 100	April 1928 152.1	March 1928 151.4	April 1927 153.6	July 1920 219.2	March 1922 138.7
Nat. Ind. Conf. Bd. Cost of Living 1914 = 100	April 1928 160.8	March 1928 161.1	April 1927 163.7	July 1920 204.5	Aug. 1922 154.5
Steel Unfilled Orders (Million Tons) 1913 = 5.91	Apr. 30 1928 3.872	Mar. 31 1928 4.335	Apr. 30 1927 3.456	July 31 1920 11.118	May 31 1927 3.051
Bank Clearings Outside N. Y. City (Billions)	April 1928 19.00	March 1928 19.72	April 1927 18.55	Oct. 1925 20.47	Feb. 1921 10.43
Business Failures Number	April 1928 1712	March 1928 2007	April 1927 1659	Jan. 1924 2231	Aug. 1925 1353
Liabilities (Millions)	41.14	51.54	56.15	122.95	27.22

*The three index numbers marked with an asterisk are computed by Mr. Richey, as follows: Fares index is average street railway fare in all United States cities with a population of 50,000 or over except New York City, and weighted according to population. Street Railway Materials index is relative average price of materials (including fuel) used in street railway operation and maintenance, weighted according to average use of such materials. Wages index is relative average maximum hourly wage of motormen, conductors and operators on 136 of the largest street and interurban railways operated in the United States, weighted according to the number of such men employed on these roads.

†This index is changed to a base of "1926 = 100." That notation replaces the former basis of "1913 = 100." Inasmuch as the bureau has not calculated the index on this new base any further back than January, 1923, no figures are shown in this tabulation for the high and low points since the war. It is planned to compute the index on the new basis as far back as January, 1913. Until such time as the bureau makes public these figures for the earlier years this information will be lacking.

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299,501 passengers on the Milwaukee and the Waukegan City Lines, and the motor coaches during the latter months of the year, is accounted for by a general slackening in industrial activities and considerable unemployment.

The company operated 13,746,370 car-miles compared with 13,485,302 the previous year and 1,299,313 bus-miles compared with 1,434,612 miles in 1926. The car-miles operated on the Milwaukee city lines were 477,615 compared with 543,207 the previous year.

FREIGHT TRAFFIC INCREASED—NEW L. C. L. METHOD

A satisfactory feature of the year's operations, was the substantial increase in the freight business. The freight and merchandise despatch business amounted to 843,000 tons, an increase of 186,000 tons over the year 1926. The increase was all in carload freight, a branch of service made possible by operation of the new Skokie Valley route.

During the year the company introduced a new method of handling less than carload freight, which is known as "ferry truck service." This service consists of a door-to-door pickup and delivery in Chicago and Milwaukee. Goods are loaded in a special steel trailer at the warehouse of the shipper and are not touched by hand until unloaded at the door of the consignee. Shipments are handled in equipment developed on the North Shore Line.

New track construction amounting to 16,500 lin.ft. was completed during the year. The new trackage mainly consists of sidetracks into industrial yards to increase facilities for handling carload freight.

CONCESSION PRIVILEGES VALUABLE

Concessions operated by the company in various stations produced a gross revenue for the year of $586,351, compared with $545,453 the previous year and net income of $68,934 for the year.

The "Better Business Campaign" to enlist the interest and support of employees in procuring new business for the railroad was continued. A total of 16,654 business "tips" was received from 815 employees. These "tips" on business often result in the development of new business.

During the year the company sold $2,500,000, three-year 5½ per cent gold notes to retire floating indebtedness and reimburse the treasury for expenditures made for additions and betterments. Equipment trust certificates to the amount of $804,000 were sold for the purchase of fifteen steel passenger cars, two steel dining cars, one steel parlor-observation car, ten steel city cars for service on the Milwaukee City Lines, and two 65-ton combination storage battery and trolley electric locomotives. First and refunding mortgage 6 per cent gold bonds to the amount of $156,400, and $92,300 of first and refunding mortgage 5½ per cent gold bonds were acquired through the operation of the sinking fund. During the year $271,000 in equipment trust certificates were retired.

Holders at Milwaukee Urged to Convert Preferred Stock

Holders of the 7 per cent preferred stock of the Milwaukee Electric Railway & Light Company, Milwaukee, Wis., series of 1921, are being urged to exchange that stock for the 6 per cent issue of the company. There has been no formal call of the 7 per cent stock for retirement, but the holders, many of them patrons of the company, are being reminded that the stock is callable on 30 day's notice on any dividend date at 105 and dividend. The point is made that the 6 per cent issue is not callable except at $110 a share.

As part of the program of keeping stockholders informed about its affairs, the company has recently reprinted for distribution among them the series of articles "Service First Is Milwaukee's Transportation Slogan," contributed to the issues of the ELECTRIC RAILWAY JOURNAL for Feb. 25 and March 3, 1928, by Charles Gordon, the editor.

Drop in Receipts in Kansas City

Electric railway and bus receipts for the Kansas City Public Service Company, Kansas City, Mo., for the period between Jan. 1 and May 6 were $139,034 less than the receipts for the corresponding period of last year. There was a decrease of 1,444,606 in street car passengers in that period, and an increase of 92,585 in bus passengers. Total business decreased 4.26 per cent.

Value of Trolleys Written Down by Delaware & Hudson

According to the *Wall Street Journal* the Delaware & Hudson Company wrote down the book value of investments in stock of affiliated companies approximately $7,000,000. This is largely due to a reduction in book value of stock of United Traction Company, Albany, N. Y., from $12,499,600 to $7,499,600 and a reduction in book value of stock of the Schenectady Railway from $2,050,000 to $1. These adjustments were concurrently debited to profit and loss.

The Delaware & Hudson Company and New York State Railways, controlled by the New York Central, own equally the 41,000 shares of Schenectady Railway common stock. United Traction Company's stock, consisting of 125,000 shares, is owned entirely by the Delaware & Hudson. This company controls the Hudson Valley Railway.

Increased Valuation of Peoples Company in Indianapolis

The Indiana board of tax commissioners has increased by $86,000 the valuation of the Peoples Motor Coach Company, Indianapolis, Ind., a subsidiary of the Indianapolis Street Railway. Its valuation has been fixed at $200,000 for tax purposes for 1928. The increase was made in spite of a representation by the railway officials that the value of the company's plant, less depreciation from original cost at the rate of 30 per cent a year on bus equipment, was barely $72,300. When the railway officials were seeking to buy the coach company for $500,000 some months ago, experts testified before the commission for the company that a 15 per cent annual depreciation charge was adequate and finally gained commission and court approval to make the purchase. The Peoples Motor Coach Company reported a net income of approximately $14,000 for 1927, about $50,000 lower than the railway officials anticipated when they made the purchase.

Action on Washington Merger Postponed

Action on the plan to merge the Capital Traction Company, the Washington Rapid Transit Company and the railway lines of the Washington Railway & Electric Company, Washington, D. C., was laid aside definitely until the next session of Congress when the Senate District committee decided on May 22 to appoint a subcommittee to go into the question during the summer.

The committee instructed Chairman Capper to prepare a resolution, to be introduced in the Senate immediately, asking for a special fund of $10,000 with which to employ experts to assist the subcommittee in its study of the merger agreement. It was indicated that this inquiry will revolve principally around the valuation, which has been placed at $50,000,000 in the merger agreement.

Senator James Couzens, Republican, of Michigan, is not a member of the District committee, but was invited to the meeting on May 22 at the suggestion of Senator Vandenberg, because of the experience he had as Mayor of Detroit in dealing with electric railway problems.

The merger resolution, authorizing the railways to consolidate in accordance with the terms of the agreement worked out, was reported favorably by the House District committee more than a week ago.

$129,754 Net in Buffalo for Quarter

A substantial improvement was made by the International Railway, Buffalo, N. Y., for the three months ended March 31. Operating revenue was $2,804,621 compared with $2,706,384 for a similar period last year. This improvement, with a decrease of $147,000 in operation and taxes and an increase of more than $7,000 in non-operating income, brought the gross income to $489,782. After deduction of fixed charges there remains a net income of $129,754 compared with a deficit of $123,167 over a similar period in 1927.

The consolidated statement bears a footnote that the 1927 figures include an amortization charge of $83,182. With the approval of the Public Service Commission this charge has been discontinued, effective Jan. 1, 1928.

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Personal Items

W. H. Burke President of Southwestern Association

W. H. Burke, district manager of the Stone & Webster properties in the Southwestern district, was elected president of the Southwestern Public Service Association at the meeting in Dallas May 2 to May 5. In Texas, Louisiana, New Mexico and Mexico Mr. Burke is well known. In 1925 he was appointed manager of the Northern Texas Traction Company of Fort Worth and the Tarrant County Traction Company. Previous to that connection he had been with the Houghton County Traction Company. He has been identified with the Stone & Webster organization for many years, entering the statistical department of

W. H. Burke

the Boston office in 1910. Later he served in Dallas.

For a while he left Stone & Webster management to go to Milwaukee and assume the position of manager of the light and power operations of the Milwaukee Electric Railway & Light Company. In 1915 he was back in the Boston office of Stone & Webster as assistant to M. M. Phinney, who was vice-president of Stone & Webster Management Association. His next move was to Keokuk, Iowa, with the Stone & Webster organization.

Mr. Burke was born in Maine. He was graduated from the University of Maine in 1906. After his graduation he spent about two years with various companies in New York and Pennsylvania on power house and substation operation and maintenance.

C. C. Phares in New Post at Akron

C. C. Phares, formerly foreman at the Brittain carhouse of the Akron property, has just been appointed to the superintendency of the Akron garages of the Northern Ohio Power & Light Company.

Mr. Phares was born at Gilman, W. Va. After he left school Mr. Phares was in the lumber business for eight or ten years. He was a member of the 54th Artillery from Boston in the World War, and was over seas for six months. When he returned to Akron he entered the employ of the International Harvester Company, and served that company more than nine years as a foreman.

For two years prior to his recent appointment he was in charge of maintenance for the Zeno Transportation Company, now included in the system of the Northern Ohio Power & Light Company.

P. J. Farrell Named to I.C.C.

President Coolidge has sent to the Senate for approval the name of Patrick J. Farrell for appointment to the Interstate Commerce Commission. The nomination is regarded as being based on his long and successful service with the commission. Mr. Farrell has been arguing cases before the Supreme Court for the commission for twenty years.

Mr. Farrell was born in Stanstead, Quebec, in 1861. He received his formal education at Wells River and Newport, Vt., but private study was his chief means of advancement. In 1880 he was a clerk for the Connecticut & Passumpsic River Railroad at Newport, Vt., later filling the positions of train dispatcher, station agent and passenger train conductor for the road. He began to study law in 1884 and was admitted to the bar and became a railway postal clerk in 1887. He resigned as chief clerk of the Railway Mail Service with headquarters at Boston in 1889 and formed a law partnership with C. A. Prouty, who later became an Interstate Commerce Commissioner.

Mr. Farrell became treasurer of the Orleans Trust Company when it was organized at Newport in 1891. He was the commission's first chief examiner and as head of the law division held the office of solicitor for several years. He was appointed chief counsel in charge of all legal matters, including those of the Bureau of Valuation, in 1918.

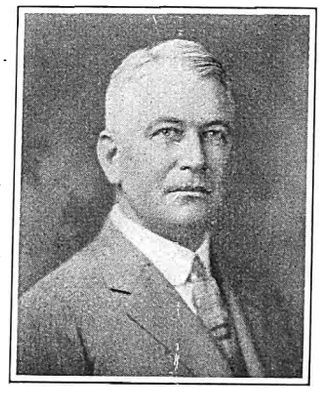
Mr. Farrell would succeed John J. Esch, now serving under a recess appointment.

PATRICK H. MOYNIHAN, since 1921 a member of the Illinois Commerce Commission, was appointed chairman of that body May 10 by Governor Len Small, succeeding David H. Jackson, who resigned April 25 at the request of the state executive.

RAY BAUMGARDNER has become director of public information for the Central and Southwest Public Utilities Company. In this work he succeeds the late George McQuaid.

J. P. Griffin Honored by Southwestern Association

James P. Griffin, vice-president in charge of all operations, Texas Electric Railway, Dallas, Tex., was elected chairman of the railway section of the Southwestern Public Service Association and vice-president of the association itself at the meeting in Dallas May 2—5. Mr. Griffin went to Dallas 23 years ago with J. F. Strickland as secretary of the Texas Traction Company, then engaged in building an interurban from Dallas to Sherman. The line was put in operation in 1908 and Mr. Griffin served as secretary, general passenger agent and auditor. Four years later he became secretary of the Southern Traction Company, then building the interurban line from Dallas to Waco and Dallas to Corsicana. When these lines were put in operation in October, 1913, Mr. Griffin also served as general passenger agent. Upon the consolidation of the Texas Traction Company and the



James P. Griffin

Southern Traction Company, under the name of the Texas Electric Railway in 1917, Mr. Griffin was elected secretary and general passenger agent, and in 1923 he was elected vice-president. Effective July 1, 1926, he was given the title of active vice-president in charge of all operations. This change became operative upon the resignation of Burr Martin, vice-president and general manager because of ill health.

Mr. Griffin was born at Waxahachie, Tex., in 1881. He was graduated from the high school there in 1900 and took special work at the University of Texas in 1903. His first railway experience was at Waxahachie in the general freight and passenger office of a subsidiary of the Southern Pacific.

THOMAS STANION, who was in charge of public relations with the St. Louis Public Service Company, St. Louis, Mo., has resigned to accept a position with the sales department of the Mutual Benefit Life Insurance Company, New York City. He will be located at 225 Broadway. Mr. Stanion has been associated with the St. Louis utility since the company was formed as the successor to the United Railways.

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Men Promoted at Providence Long with Property

R. Roscoe Anderson, Joseph A. Lockhart and James A. Hackett have taken on their new duties with the United Electric Railways, Providence, R. I. The announcement of their appointments was referred to in ELECTRIC RAILWAY JOURNAL, issue of April 28, 1928.

Mr. Anderson, who has been promoted to the post of general superintendent of operations, has been superintendent of transportation since 1907. At that time he succeeded Samuel Riddell, who was made general manager of the Chicago, South Bend & Northern Indiana Traction Company. Mr. Anderson entered the service of the Rhode Island Company in 1894 as a clerk, reporting to A. T. Potter, who at that time was general manager of the company but later became vice-president. When Mr. Potter became vice-president Mr. Anderson became chief clerk in the office of the superintendent of transportation. Mr. Anderson was born in Utica, N. Y., 55 years ago. He has lived in Providence practically all his life.

Joseph A. Lockhart, who has taken on the duties of assistant superintendent of transportation, has been an employee of the United Electric Railways for about 23 years. Early in his career he was in charge of the North Main Street carhouse and during the first years of his employment worked in various capacities. Twenty-one years ago he was assigned to the claim department and for fifteen years was assistant to Charles E. Redfern, general claim agent. Before he went to Providence he was division superintendent of the Newport-Fall River Street Railway under E. P. Shaw. This was a small company but Mr. Lockhart's duties were many. In addition to his managerial work he was purchasing agent, had charge of the power station, the track work and the line repairs, the employees of these divisions being subject to his direction.

Mr. Hackett, who becomes supervisor of traffic, has been employed by the United Electric Railways for 39 years, working during that period of time as hill boy, horse-car driver, motorman, inspector, chief inspector and supervisor of traffic. Mr. Hackett has lived in Providence all his life. He was born there on June 13, 1873.

Obituary

ERNEST HATTON, who retired two years ago from the post of general manager and engineer of the Newcastle-on-Tyne Corporation Tramways after 21-years' service, died on April 26. He had rendered notable services in regard to extension of the Newcastle tramways in the starting and carrying on of the large municipal bus undertaking. At one time he took a prominent part in the two British tramway associations' proceedings.

Manufactures *and the* Markets

A.E.R.A. Exhibit Committee Makes Space Assignments

SPACE was assigned at the meeting in Cleveland, May 16, by the exhibit committee of the American Electric Railway Association to 176 exhibitors for the 47th Annual Convention which will take place in that city, September 22nd to 28th inclusive. An assignment of 102,170 net square feet of space was disposed of, this exclusive of any track space for the display of street cars. The space demand has exceeded all expectations, according to Fred C. J. Dell, director of exhibits.

"The exhibit of the American Electric Railway Association has grown in size each year. Likewise has the association added to its membership roster and convention registration," said Mr. Dell, in commenting on the recent meeting.

A list of the manufacturer member companies which will exhibit, together with the spaces to be occupied follows:

Name	Booth No.
Adams & Westlake Company	604
Ahlberg Bearing Company	605 and 606
Aluminum Company of America	141
American Brake Materials Corporation	277
American Brake Shoe & Foundry company	249
American Brass Company	½ of 205
American Car & Foundry Company	½ of 120
American Car & Foundry Motors Company	618 to 623
American Crucible Products Company	310
American Steel & Wire Company	206
Anaconda Copper Mining Company	½ of 205
Anderson Brake Adjuster Company	232
Arco Company	498 and 499
Art Rattan Works	404
Association of Manufacturers of Chilled Car Wheels	210A
Baldwin Locomotive Works	208A
Bender Body Company	600 to 603 inclusive
Bendix Brake Company	407
Bethlehem Steel Company	283 to 289 inclusive
Binks Spray Equipment Company	425 and 427
Robert Bosch Magneto Company	617
Bragg-Kliesrath Corporation	406
J. G. Brill Company	½ of 120
Brown-Lipe Gear Company	437
Budd Wheel Company	480
Bus Age	520
Bus Transportation	102
C. G. Spring & Bumper Company	513 and 514
Canadian Cleveland Fare Box Company	665
Philip Carey Company	258 and 260
L. C. Chase & Company	405
Cheatham Electric Switching Device Company	263
Chillingworth Manufacturing Company	616
Chilton Class Journal Company	502
Christensen Air Brake Company	423
Clark Equipment Company	607
Cleveland Fare Box Company	664
Cleveland Frog & Crossing Company	278-279-280
Cleveland Pneumatic Tool Company	452
Collier, Barron G., Inc.	104
Collier Construction Company	311
Consolidated Car Heating Company	118 and 119
Continental Motors Corporation	497
Cowdrey Brake Tester Organization	½ of 663
Crew Levick Company	492
Curtin Howe Corporation	225
Dayton Mechanical Tie Company	257 and 259
De Luxe Products Corporation	454
DeVilbiss Company	500
C. L. Downey Company	666
Eagle-Ottawa Leather Company	½ of 501
C. I. Earll	615
Eberhard Manufacturing Company	627
Eclipse Railway Supply Company	248
Economy Electric Devices Company	Porton of 116
O. M. Edwards Company	671
Electric Railway Improvement Co.	330 and 331
ELECTRIC RAILWAY JOURNAL	101
Electric Service Supplies Company	202 and 203
Electric Traction	103
Erie Malleable Iron Company	625
Federal-Mogul Corporation	519
Feralite Corporation	629
Ferodo & Asbestos, Inc.	421
FitzJohn Manufacturing Company	402 and 403
Four-Way Lock Company	668
Fuller & Sons Manufacturing Co.	424
General Electric Company	113
General Motors Truck Company	412-413-414-415-416-417-418-419
A. Gilbert & Sons Brass Company	679
Glidden Company	449 and ½ of 451
Globe Ticket Company	233
W. S. Godwin Company	125
Gold Car Heating & Lighting Co.	234
Graham Brothers	420
Gramm Motors, Inc.	659
Griffin Wheel Company	106
Guide Motor Lamp Company	685
Hale & Kilburn Company	215-216-217
Hannum Manufacturing Company	631
Haskelite Manufacturing Company	401
Hercules Motors Corporation	495
Heywood-Wakefield Company	206A
Hunt-Spiller Manufacturing Co.	408
Hyatt Roller Bearing Company	633 and 635
Hynson Westcott & Dunning	332 and 333
Illinois Motive Equipment Co.	121
International Motor Company	440-442-444
International Register Company	127
International Steel Tie Company	300 to 309, inclusive
Irving Iron Works Company	684
Johns-Manville Corporation	411
Johnson Fare Box Company	652
R. F. Johnston Paint Company	123 and 124
Kelton Aurand Manufacturing Co.	426
Lang Body Company	447
Leece-Neville Company	½ of 624
Lorain Steel Company	207 and 208
MacDonald Manufacturing Company	681 and 682
Mack-International Motor Truck Corporation	441-443-445
Mack Motor Truck Company	446
Mack Trucks, Inc.	439
Malleable Screw Products Company	335
Manganese Steel Forge Company	295
Martindale Electric Company	312
Massillon Steel Casting Company	489
Jas. H. Matthews & Company	667
McGill Metal Company	409
Metal & Thermit Corporation	324 to 329, inclusive
Money-Meters, Inc.	122
Nachod & U. S. Signal Co., Inc.	262
National Brake Company, Inc.	610
National Carbon Company	226 and 228
National Cash Register Company	611 and 612
National Malleable & Steel Castings	465
National Pneumatic Company	107-109-111
National Railway Appliance Company	Portion of 117
New Departure Manufacturing Co.	½ of 624
Nichols-Lintern Company	672
Norma-Hoffmann Bearings Corporation	613-614
North East Electric Company	608 and 609
R. D. Nuttall Company	110
Ohio Brass Company	115
Ohmer Fare Register Company	250 to 256, inclusive
Oil Jack Company, Inc.	410
Okonite Callender Cable Company	½ of 219
Okonite Company	½ of 219
Pantasote Company, Inc.	204
Perey Manufacturing Company	223 and 224
Radel Leather Manufacturing Co.	670
Rail Joint Company	209
Railway Age	464
Railway Materials Corporation	291 and 293
Railway Purchases and Stores	669
Railway Track-Work Company	320 to 323, inclusive
Railway Utility Company	313 and 314
H. H. Robertson Company	296

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Root Spring Scraper Company	315
Ross Gear and Tool Company	626
Russell Manufacturing Company	429
S K F Industries, Inc.	218
St. Louis Car Company	105
Safety Car Devices Company	½ of 108
Safety Equipment Service Company.	637
Saf-T-Cab Corporation	422 and 448
Sattley Company	126
Peter Smith Heater Company	338
Snap-On Wrench Company	428
South Bend Lathe Works	453 and 455
Standard Steel Works Company	207A
Standard Underground Cable Co.	290
Studebaker Corporation of America.	474–475–476
Swartwout Company	264–266
Texas Company	128 and 130
Timken-Detroit Axle Company	400
Timken Roller Bearing Company	482 and 484
Tool Steel Gear & Pinion Company	Portion of 116
Tuco Products Company	644
Twin Coach Corporation	466 to 473, inclusive
Una Welding & Bonding Company	336 and 337
Union Metal Manufacturing Co.	651
Universal Lubricating Company	292 and 294
Van Dorn Coupler Company	261
Versare Corporation	660
Walter Motor Truck Company	½ of 663
Waukesha Motor Company	493
Westinghouse Companies	114
Westinghouse Electric & Manufacturing Company	112
Westinghouse Traction Brake Co.	½ of 108
William Wharton, Jr., & Company	222
Wheel Truing Brake Shoe Company	282
White Company	653 to 658
Willard Storage Battery Company	639
Wilson Imperial Company	129
Alan Wood Iron and Steel Company	½ of 501
Zenith Detroit Corporation	628

The following member companies have made application for track space upon which cars will be shown.

Cincinnati Car Company
Cleveland Southwestern Railway & Light Co.
Illinois Traction System
St. Louis Car Company

Rubber Institute Organized

Manufacturers of rubber goods in America will be placed on a sound economic basis and the present financial stringency within the industry will be removed if the Rubber Institute, organized in New York City on May 23 by a group of leading manufacturers, achieves its purpose. Gen. Lincoln C. Andrews, former Assistant Secretary of the Treasury in charge of prohibition, will be director general, and every rubber manufacturer in the country has been invited to become a member.

The institute will attempt, it is said, to eliminate overproduction. It will make a study of import laws on crude rubber and trading methods. It also will study scientific manufacturing methods and the means of eliminating waste.

General Andrews is well known among electric railway men. He has been receiver of the New York & Queens County Railway, Long Island City, since 1923. For two years previous he was chief executive officer of the New York Transit Commission. In 1925 he was made assistant secretary of the United States Treasury, succeeding Eliot Wadsworth, Boston, resigned.

Final Specifications Twin City Cars

Information received subsequent to the publication of specifications on the 25 new cars for the Twin City Rapid Transit Company in the March 31, 1928, issue of the JOURNAL indicates several revisions of the previously published specifications. The cars are single-end and are equipped with four GE-258K motors. The total weight is 28,038 lb. and is divided: Body 12,100 lb.; trucks, 8,200 lb.; equipment, 7,738 lb. The door engines are furnished by Consolidated Car Heating Company.

Oklahoma Improvements Under Way

Oklahoma Railway, Oklahoma City, Okla., is expending about $14,000 in improvements on its Seventeenth Street station. Work on its industrial freight line, details of which were given in the March 10 issue of the JOURNAL, to cost approximately $1,250,000, is progressing rapidly. Construction of a new bus building and shops, south of Exchange Avenue, will be started soon.

Japan Railway to Improve

Japanese Government Railways, Tokyo, Japan, will expend $85,195,500 during 1928 on railway improvements, including electrification, improvement of stations, installation of heavier rails and work on tunnels. About $25,780,000 will be spent on the construction of new railway lines.

Twenty-five Articulated Cars for Cleveland

Cleveland Railway, Cleveland, Ohio, will receive in June 25 articulated, three-truck, city-type cars now being built by the G. C. Kuhlman Car Company, Cleveland, Ohio. The cars are for two-man, single-end operation and seat 104 passengers. They are 101 ft. long, 8 ft. 4½ in. wide and weigh 76,080 lb.

The bodies are of the all-steel type with arch roofs. They are finished with an orange and cream color scheme. The interior trim is mahogany and the seating material is leather. The motor resistances are utilized for heating the front section in addition to the standard heating units. Complete specifications are given below.

Weights:	
Car body	42,210 lb.
Trucks	19,620 lb.
Equipment	14,250 lb.
Total	76,080 lb.
Bolster centers	37 ft. 6 in.
Length over all	101 ft.
Length over body posts	88 ft. 2½ in.
Truck wheelbase	6 ft. 1 in.
Width over all	8 ft. 4½ in.
Height, rail to trolley base	10 ft. 10½ in.
Window post spacing	29¼ in.
Doors	Center and end
Air Brakes	Westinghouse Traction Brake Company
Armature bearings	Plain
Axles	Brill
Car signal system	Consolidated Car Heating Company
Compressors	Westinghouse DH-25
Conduit	Duratube
Control	HL
Curtain fixtures	National Lock Washer Company
Curtain material	Fabrikoid
Destination signs	Hunter
Door mechanism, Consolidated Car Heating Company	
Doors	Folding and sliding
Energy saving device	Economy meter
Fare boxes	Cleveland
Finish	G.M.F.
Floor covering	Kass treads in aisles
Gears and pinions	Nuttall helical
Glass	Protex
Hand brakes	Peacock staffless
Heaters, Consolidated Car Heating Company, electric	
Headlights	Golden Glow
Headlining	Agasote
Interior trim	Mahogany
Journal bearings	Timken roller
Journal boxes	Brill
Lamp fixtures	Dome—Graybar Electric Company
Motors	Six Westinghouse 340-P, inside hung
Painting scheme	Orange and cream
Roof material	Poplar, canvas covered
Safety devices	Safety Car Devices Company
Sash fixtures	National Lock Washer Company
Seats	Hale-Kilburn
Seat spacing	29½ in.
Seating material	Cletan leather
Slack adjusters	Brill
Steps	Stationary
Step treads	Kass and treadle door
Trolley catchers	Ohio Brass
Trolley base	Nuttall
Trolley wheels	O-B, Feist patent
Trucks	Three Brill, 68-E-2
Ventilators	Nichols-Lintern, low type
Wheels, type	Rolled steel, 26-in. diameter
Wheelguards or fenders	H-B type

Osborne Re-elected Chairman of Industrial Board

National Industrial Conference Board at its twelfth annual meeting re-elected Loyall A. Osborne, president of the Westinghouse Electric International Company, as chairman of the board for the ensuing year.

Fred I. Kent, a director of the Bankers Trust Company, was re-elected treasurer of the Conference Board; and the following vice-chairman were elected: Charles Cheney, president of Cheney Brothers, South Manchester, Conn.; Irenee du Pont, chairman of the finance committee of E. I. du Pont de Nemours & Company; Wilmington, Del.; Herbert F. Perkins, first vice-president of the International Harvester Company, Chicago, Ill., and George S. Harris, president of the Exposition Cotton Mills, Atlanta, Ga.

The executive committee for the ensuing year will be composed of the following: William D. Baldwin, chairman of Otis Elevator Company, A. Farwell Bemis, chairman of Bemis Brothers Bag Company, Boston, Mass.; Cornelius F. Kelley, president of Anaconda Copper Mining Company; William H. Nichols, Jr., president of General Chemical Company, as well as the officers.

Seattle Specifications Issued

Seattle Municipal Street Railway, Seattle, Wash., has issued specifications on the 100 cars to be purchased from the St. Louis Car Company, as mentioned in the April 28 issue of ELECTRIC RAILWAY JOURNAL.

The cars are to be of the one-man, two-man, single-end type. Each car will be built with straight sides, round ends, arch roof, platform floor on the same level as body floor with 3-in. ramp, open bulkheads, double sash—top sash to be stationary, lower sash to raise—and folding doors at front right and center right.

There are to be eighteen windows on one side of the car and fourteen on the other, all equipped with double sash, top sash to be one continuous length. Each set of doors is to have a 4-ft. 6-in. opening and is to be hung on pipe shaft ball bearing hinges bolted in place. The joining hinges are to be Feist self-

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lubricating No. 372 on the center and 373 on the front.

The closed side of the car is to be fitted with fourteen cross seats and one longitudinal seat and the opposite side to be fitted with seven cross seats, one longitudinal seat and one folding conductor seat. The rear is to have two stationary seats and one folding seat.

Specifications for these cars are given; below:

Type of unit	One-man, two-man; motor; passenger city; single end; double truck
Number of seats	58
Bolster centers	26 ft. 2 in.
Length over all	47 ft. 0 in.
Truck wheelbase	5 ft. 4 in.
Width over all	8 ft. 8 in.
Height, rail to trolley base	12 ft. 8 in.
Window post spacing	28½ in.
Body	Semi-steel
Roof	Arch
Doors	Center and end
Air brakes	Westinghouse variable load
Car signal system	Faraday
Conduit	Duraduct
Control	K35-KK
Couplers	Drawbar
Curtain material	Pantasote, pattern X2, color 74
Destination signs	Hunter
Door mechanism	National Pneumatic
Doors	Folding, one center treadle
Energy saving device	Economy meter
Fare boxes	Johnson DM-3
Fenders	H-B life guard and company's standard
Finish	Sherwin-Williams enamel
Floor covering	Wood, aisle grooved
Gears and pinions	Tool Steel
Glass	DSAA
Heaters	Consolidated No. 303
Headlights	One O-B style Z-28645
Interior trim	Mahogany, bronze trimmings
Motors	Four Westinghouse 510-A or G-E 265
Painting scheme	Orange
Roof material	Haskelite
Sash fixtures	Bronze
Seats	Steel
Seat spacing	28½ in.
Seating material	Leather
Trolley catcher	O-B
Trolley base	U.S.-15
Trolley wheel	5 in.
Ventilators	Sixteen, small type
Wheels	Steel, 26 in. diameter

ROLLING STOCK

NORTHERN OHIO POWER & LIGHT COMPANY, Akron, Ohio, has just ordered fifteen more Twin Coaches from the Twin Coach Corporation, Kent, Ohio.

CHICAGO, SOUTH SHORE & SOUTH BEND RAILROAD, Michigan City, Ind., has ordered ten all-steel motor cars from the Standard Steel Car Company, Hammond, Ind. The cars are practically duplicates of the previous fleet put in service last summer.

CINCINNATI STREET RAILWAY, Cincinnati, Ohio, has ordered eight Twin Coaches at an approximate cost of $90,000.

ILLINOIS CENTRAL RAILROAD, Chicago, Ill., has ordered ten suburban type motor cars and ten trailer cars from the Pullman Car & Manufacturing Company.

BRITISH COLUMBIA ELECTRIC RAILWAY, Vancouver, B. C., Canada, will be asked by the City Council to replace at least part of the present new Westminster Street car system with bus service.

CHICAGO, NORTH SHORE & MILWAUKEE RAILROAD, Chicago, Ill., has received five of the fifteen all-steel cars ordered last fall from the Pullman Car & Manufacturing Corporation.

ST. LOUIS PUBLIC SERVICE COMPANY, St. Louis, Mo., has received four urban type Twin Coaches and has ordered two more coaches from the Twin Coach Corporation.

WINNNIPEG ELECTRIC COMPANY, Winnipeg, Man., Canada, has purchased two more coaches from the Twin Coach Corporation.

CHICAGO, SOUTH SHORE & SOUTH BEND RAILROAD, Michigan City, Ind., has ordered two more 80-ton Baldwin-Westinghouse electric locomotives, to be delivered in the fall.

QUINCY STREET RAILWAY, Quincy, Ill., has been granted a permit to operate buses to Public Square and Soldiers' Home.

ILLINOIS POWER & LIGHT CORPORATION, Chicago, Ill., has purchased four 21 passenger city type Yellow buses.

BROOKLYN CITY RAILROAD, Brooklyn, N. Y., has added four White Model 50-B buses to its fleet.

TRACK AND LINE

STARK ELECTRIC RAILROAD, Alliance, Ohio, is installing an automatic signal system and new portable substations between Canton and Alliance.

PACIFIC ELECTRIC RAILWAY, Los Angeles, Cal., is co-operating with the city of Long Beach in putting through the Pacific Avenue extension. Plans for the underpass of the tracks are now being revised. The cost of the project will be about $142,000 in which the city, the county and the Pacific Electric will share.

SHOPS AND BUILDINGS

NEW YORK, NEW HAVEN & HARTFORD RAILROAD, New Haven, Conn., has let a contract to Babor-Comeau & Company, New York, for the extension of the facilities at the Van Nest shops, New York City. The work includes a steel and brick structure 106x375 ft. and will cost approximately $250,000.

PACIFIC ELECTRIC RAILWAY, Los Angeles, Cal., will construct new carhouses just west of Loma Vista Drive between Seventh and Anahaim Streets, Long Beach, Cal. This improvement will cost about $250,000.

METAL, COAL AND MATERIAL PRICES
F. O. B. REFINERY

	May 22, 1928
Metals—New York	
Copper, electrolytic, cents per lb	14.275
Copper wire, cents per lb	16.5
Lead, cents per lb	6.10
Zinc, cents per lb	6.475
Tin, Straits, cents per lb	51.5
Bituminous Coal, f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	4.20
Somerset mine run, f.o.b. mines, net tons	1.875
Pittsburgh mine run, Pittsburgh, net tons	1.95
Franklin, Ill., screenings, Chicago, net tons	1.65
Central, Ill., screenings, Chicago, net tons	1.575
Kansas screenings, Kansas City, net tons	2.50
Materials	
Rubber-covered wire, N. Y., No. 14, per 1,000 ft	5.65
Weatherproof wire base, N.Y., cents per lb.	17.00
Cement, Chicago net prices, without bags	2.05
Linseed oil (5-bbl. lots) N. Y., cents per lb.	10.7
White lead in oil (100-lb. keg), N. Y., cents per lb	13.75
Turpentine (bbl. lots), N. Y., per gal	$0.57

TRADE NOTES

H. R. SYKES has been appointed manager of the locomotive division of the Cincinnati Car Company, Cincinnati, Ohio.

WAGNER ELECTRIC CORPORATION, St. Louis, Mo., announces that E. D. Pike, heretofore in charge of Wagner Electric Pacific Coast service operation is now manager of the San Francisco branch sales office.

MANGANESE STEEL FORGE COMPANY announces the removal of its Chicago office from the Old Colony Building to the Builders' Building, La Salle Street and Wacker Drive.

BILLINGS & SPENCER COMPANY, Hartford, Conn., has appointed J. V. Moore, formerly with the Simonds Saw & Steel Company, as its representative in Pennsylvania, Delaware and New Jersey, with headquarters in Huntingdon, Penn.

CURTIN-HOWE CORPORATION, New York, has appointed B. Kuckuck as its chief engineer. Since 1904 he has been working in wood preservation, first with Hulsberg & Company, Berlin, and later in this country in connection with the designing of the Santa Fe treating plant at Somerville, Tex., and with the general introduction of the Rueping process. Since 1918 he has been chief engineer of Gebr. Himmelsback, a wood preserving company in southern Germany.

ADVERTISING LITERATURE

GLOBE-WERNICKE COMPANY, Cincinnati, Ohio, has published a booklet on a system for the filing and indexing of maps, plans, drawings and similar large sheets.

MARTINDALE ELECTRIC COMPANY, Cleveland, Ohio, has issued a folder announcing a 27 per cent average price reduction on Martindale commutator stones.

PARKER APPLIANCE COMPANY, Cleveland, Ohio, has issued a desk folder giving technical data and price list of Parker tube couplings and a bulletin of specifications on installations in buildings and power plants.

GENERAL ELECTRIC COMPANY, Schenectady, N. Y., has issued the following bulletins: 252A on type M control system for railway service, 19D on enclosed magnetic switches, 468A on drum type controllers, 743A on drum controllers, 881 on gas engine driven arc welder, 949 on temperature overload relays, 569A on constant potential arc welding sets, 874 on type WD-200A arc welder, 823A on atomic hydrogen arc welding equipment and 980 on enclosed speed-regulating rheostats.

ELWELL-PARKER ELECTRIC COMPANY, Cleveland, Ohio, has published a catalog describing its outstanding types of electric industrial trucks and tractors.

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Stimulate the Desire to Ride

Appeal to the average car rider's senses rather than his reason and he responds readily. He insists on a smooth and speedy ride; he wants a COMFORTABLE SEAT.

Brill No. 201-B reversible seat is performing an important part in making the electric car more desirable to the traveling public. It attracts the eye and when a passenger becomes seated, he is convinced that the seat is fully as comfortable as it is attractive. He is induced to ride more often.

The Southwest Missouri Railway Company, Springfield Street Railway Company, Lehigh Valley Transit Company, Washington Railway & Electric Company, and the Fitchburg & Leominster Railway Company are among those transportation companies that have placed orders for this type seat during the past year.

Specify Brill Seats—it pays.

THE J. G. BRILL COMPANY
PHILADELPHIA, PA.
AMERICAN CAR CO. ST. LOUIS MO. — G.C. KUHLMAN CAR CO. CLEVELAND, OHIO. — WASON MANF'G CO. SPRINGFIELD, MASS.

Brill Seats Build Transportation Sales

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When silence is really golden

At the Railway Supply Manufacturers Association Convention
Atlantic City, N. J.
June 20 to 27
Exhibit Space:
725 and 726
Headquarters:
Ritz-Carlton Hotel

TIMKEN Worm Drive Axles are silent. That silence is significant. It means efficiency and long-life; just as noise tells of wear and diminishing efficiency.

The more experience you have with Timken Worm Drive Axles, the stronger will your conviction be that their silence is golden — a cash asset.

THE TIMKEN-DETROIT AXLE CO., DETROIT, MICH.

TIMKEN AXLES

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ELECTRIC RAILWAY JOURNAL

McGraw-Hill Publishing Company, Inc. JUNE 2, 1928 Twenty Cents Per Copy

Spokesteel

THE MODERN WHEEL FOR BUSES AND TRUCKS

ONE-PIECE, HIGH-CARBON, FORGED STEEL — STRONGEST PER POUND

EASILY HANDLED, GOOD-LOOKING SPOKE-TYPE CONSTRUCTION

RIGID, POSITIVE, SIMPLE MOUNTING

COOLEST OPERATION AND TIRE-SAVING

DISSIPATES SOUNDS CLEANS THOROUGHLY

SPONSORED BY WORLD'S LARGEST WHEEL MANUFACTURERS

MOTOR WHEEL CORPORATION, LANSING, MICHIGAN

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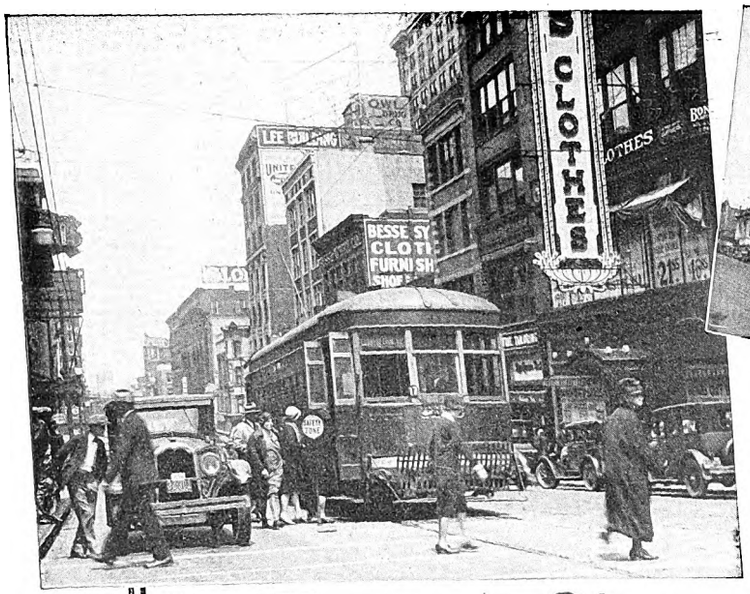
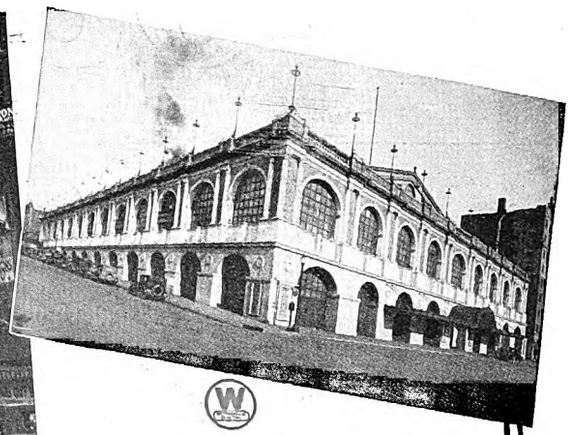
Be it resolved that:

Modernized Electric Railway Transportation contributes to the welfare and prosperity of city, state and nation.





Above—The Home of Republican National Convention.

Left—A One-Man Car in Kansas City with Westinghouse motors.

In Kansas City—

THE interest of the nation now centers upon Kansas City and Houston, acting as hosts to the National Conventions of Republicans and Democrats, respectively, in June.

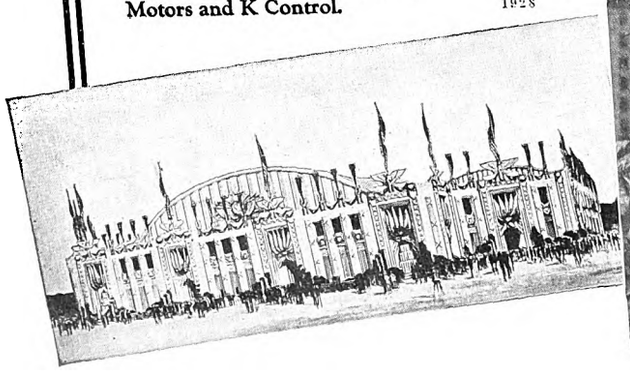
Delegates to both Conventions will endorse the foregoing resolution so outstandingly exemplified in the excellent transportation service afforded by the Kansas City Public Service Company and the Houston Electric Company.

Up-to-date cars, rebuilt track, an efficient personnel, and Westinghouse motors and control make the superior electric railway service possible in these flourishing cities.

In Houston—

Below—The Home of Democratic National Convention, seating 25,000 people.

Right—One of the new 20 de luxe cars recently placed in service in Houston. They have Westinghouse Type 510 Motors and K Control.



Westinghouse

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Electric Railway Journal

McGraw-Hill Publishing Co., Inc.
JAMES H. MCGRAW, *President*

Consolidation of
Street Railway Journal and
Electric Railway Review

CHARLES GORDON
Editor

Volume 71 New York, Saturday, June 2, 1928 *Number 22*

Fares, Too, Can Be Made to Please the Patrons

EVIDENCE that it is possible to obtain more revenue from the riders on a street railway system and do it while pleasing the public rather than antagonizing it is given in the article by H. E. Weyman in this issue. When revenues were decreasing, some three years ago, he introduced a weekly pass on a portion of the system and at the same time increased the cash fare. Much care was used to inform the regular riders that they could obtain their transportation with no increase of rate by the purchase of passes. The plan proved so successful that later the pass was extended to cover all the zones. A glance at the charts shows that there was an increase in the cash fare at the same time that there was an increase in the regular riders who used either passes or reduced-rate tickets.

Previously tickets had been sold at four for 30 cents. Under the new plan they are sold at six for 45 cents, the idea being to discourage the use of the reduced rate and to encourage the use of the pass. As a rule it is a poor policy to adopt a rate that is awkward, or in any other way penalize the regular or semi-regular user of the service. It would be more in line with modern ideas to make the rate six for 50 cents, or if that could not be obtained, to sell seven for 50 cents. The loss of time and the inconvenience involved in making change at the odd rate would seem to make it undesirable, and the investment at the 50-cent rate would be so little more that few persons would be deterred by the difference.

The excellent results obtained in Levis indicate that much credit is due to care used by the management in introducing the new fare system and in keeping it popular after it was introduced. Items published in this paper from time to time indicate that many things have been done to make the fare system popular. Although, as Mr. Weyman states, the effect of introduction of the new fare schedule was feared, the whole-hearted manner used in putting it into effect has resulted in its being very much of a success.

A Modern Maintenance Plant

PROVISION of adequate maintenance facilities is an important part of the major rehabilitation program being carried out in the cities of Springfield and Worcester, Mass. The new Grove Street carhouse and garage, on which an article is published in last week's issue, are intended to provide facilities which will insure adequate and economical maintenance of the new cars and buses that have been purchased for the Worcester property.

Two general features of the Grove Street plant are of particular interest. Here, a modern carhouse and a 50-bus garage are located on a single plot of land so as to avoid duplication of air compressors, boilers for steam and hot water, and other service equipment. This installation represents an ideal combination of a carhouse and garage. There is an opportunity here for co-ordination of maintenance work on cars and automotive vehicles and at the same time provide the facilities required for each type of vehicle.

Although there is nothing specially unusual in the general design of the garage, the depressed pit section is particularly interesting. The plan of piping grease and transmission oil under pressure directly to conveniently located outlets in the pits has a double advantage of reducing lost motion and at the same time making it possible to keep pits clean and sanitary. With respect to the facilities provided for efficient bus maintenance perhaps the greatest interest attaches not so much to the garage building as to the maintenance equipment which has been installed. When selecting the machinery for the Grove Street garage attention was given to the heavy duty which such equipment must withstand in bus maintenance work.

Pittsburgh Joins the Pioneers

IT WASN'T very long ago—less than three years, in fact—when railway men looked upon the exhibit of the Grand Rapids Railway at Atlantic City with feelings that ranged from wonder to amusement. Here was a railway actually trying to make its street cars attractive to patrons. Here was a railway trying to make car riding popular, by improving the appearance of the vehicle. Leather upholstered seats! Band brakes! Skirts on the sides! Bright colors! Shades of the horse car! No one but a circus man would try to do that to a street car. That might be all right for buses, but for cars—railway executives stopped and looked, but kept their opinions to themselves!

Since that time W. L. Harwood pioneered the Springfield car, J. R. Blackall the Joliet car—and many other cars that followed have attracted the industry's attention. Last year at Cleveland more radical departures from conventional practice were shown in a single exhibit than the industry had seen in a decade. Now comes the Pittsburgh car! Read the article elsewhere in this issue! Surely something has been happening in the industry since L. J. DeLamarter had the temerity to strike out for something better in the way of a street car.

The new Pittsburgh cars are frankly experimental. They include practically every innovation in car design tried up to this time, with the possible exception of the substitution of aluminum for steel in body framing. In addition, other features are being tried for the first time. The purpose is to make possible an exhaustive study in actual operation of factors likely to appeal to passengers. The Pittsburgh management also expects to determine from actual experience with the vehicle in service the practicability of many equipment features proposed for the improvement of car performance.

Undoubtedly some of these will not stand the test of

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mass transportation service. That is what the Pittsburgh company is trying to find out. It proposes to utilize that experience in selecting Pittsburgh's future car equipment. Of one thing the management is convinced. The appearance and performance of electric railway cars *must* be improved if rail service is to meet and overcome the competition of the privately-owned automobile.

Perhaps the equipment on these cars is too complicated. Even if produced in large quantities they would undoubtedly be expensive in first cost and maintenance. Simplicity is an important characteristic of design, along with appearance, comfort and performance. A reaction has already set in from the glaring color combinations of some of the early attempts to beautify cars. A similar reversal toward simplification of equipment may be expected in the evolution of improved performance. Cost, reliability and ease of maintenance must be kept in mind in the effort to improve the street car.

Although the Pittsburgh cars are the most recent in the rapid series of car innovations, they are only the forerunners of many more to come. The metamorphosis of the street car is in full swing, and all signs point to its emergence from an ugly duckling to a thing of beauty and pride on our city streets—to use an imperfect metaphor. There are indications that the small, light, four-wheel car may be expected to play an important part in this evolution. Even the trolley bus in this country is showing signs of revived vitality.

All of these things give increased emphasis to the declarations of those who have said that after 40 years of local transportation we still have much to learn. Pittsburgh is doing its part. It is entitled to full credit in undertaking to put to the test of experience many of the recent innovations that have attracted interest.

Chicago's 5,441 Honor Men

GUIDING a street car successfully through the intricacies of traffic in a city such as Chicago day in and day out is a real achievement. And when 5,441 men do it for a whole year without a single accident the performance takes on an unusual aspect. Yet this is the record that men in the employ of the Chicago Surface Lines achieved last year.

On its part it would seem that the general public is disposed too much to accept meritorious service as its right. Trains whirl through the night at high speed, boats plough the seas beset by storm and fog and many other dangers, street cars speed through city streets encompassed at all times by a thousand hazards. It is true that on the common carrier rests the obligation to get the passenger through safely to his destination, but the hazards are great and the likelihood of human failure is always present. A child killed in the street, a passenger maimed or a pedestrian injured can mean only woe in some household somewhere.

Only at the occasional occurrences of man-failure is the public aroused, often negatively rather than positively. This is a tendency from which even the railways, the Chicago system among them, have not been free. In fact, the former plan of keeping accident records in use by that company tended to focus attention on the few men who were in trouble rather than on the many who were satisfactorily performing their daily duties. That point of view has now been reversed.

Heroic or spectacular achievement deserves its reward, but after all it is the day-by-day work accomplished, often with great celerity but with none of the aspects of the spectacular, that counts. It is never pleasant to contemplate the theory of chances as applied to the matter of hazards to which everyone always is subject. The obligation to be careful is not lightly accepted by public service corporations, but it would be reassuring to know that all drivers of vehicles had been subjected to tests comparable in their severity to the ones to which all motormen and conductors must first submit before they are accepted as being qualified for their tasks.

The preponderance of men on the Chicago Surface Lines who have won the right to wear the insignia of merit which stamps them as being most careful should be reassuring to all users of the company's service who do not take life with a spirit that is carefree. Certainly the Chicago Surface Lines has every reason to be proud of its record. And the citizens of Chicago have every reason to be proud of the organization which established that record. It is an unusual accomplishment. The results attained were achieved only by constant vigilance sustained by a properly aroused sense of individual responsibility.

Safety Campaigns Need Concentrated Responsibility

DURING the recent "Safety—Save a Life" campaign, held in Philadelphia, an article on which appears elsewhere in this issue, the accident rate kept right on increasing. The number of accidents, both in the city and in the state of Pennsylvania, was greater than during a similar period in 1927. From this it might appear that safety campaigns are merely "open seasons" for the running down of pedestrians and the mutual destruction of autoists.

Yet if the campaign of this year is compared with the "Will Livelong" safety campaign conducted by the Philadelphia Rapid Transit Company in Philadelphia in April, 1927, some interesting observations may be made. Last year's campaign, for which the local transit organization was almost wholly responsible and which it financed entirely, produced a reduction in street fatalities during April of 26 per cent as compared with the similar month in 1926. Within the company organization an excellent record was established for reduction in car collisions and all types of accidents during the campaign. This year, while it seems that the divided responsibility for the drive produced no tangible results in increased street safety for the city, the transit organization was able to effect a further reduction in its own accident record.

This comparison seems to show that any city-wide movement, whether it be for safety or for some other purpose, needs a definite co-ordinating influence. Where the responsibility is left to individual organizations to pick up various phases of the work and carry them on independently, there is lacking an all-important unity of effort. The inertia in a large city and particularly in a state the size of Pennsylvania is great and cannot be overcome in a short period or by scattered effort.

The passing of kindly old Will Livelong, the safety sage, from the picture in Philadelphia was to be regretted. The personal type of campaign built around a central figure was able to reach the heart chords of the average citizen and to arouse him from an apathy which no amount of pure logic and reasoning could touch. Perhaps the old man might be brought back on the job again. It seems that he or some character like him was sorely missed this April.

The policy of Mitten Management in providing for

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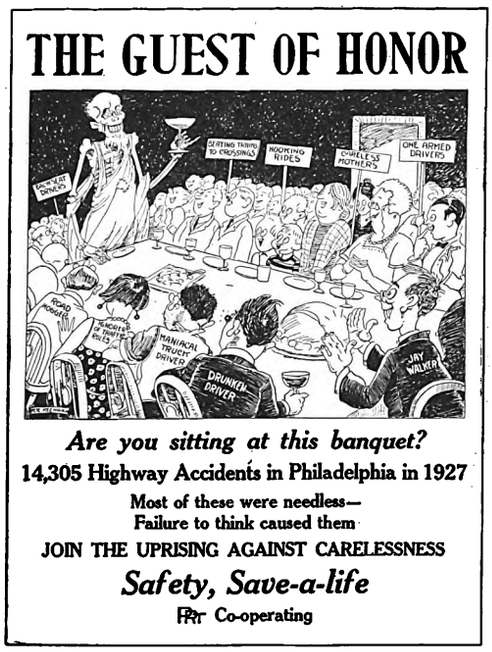

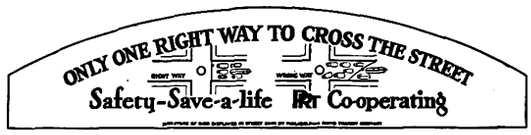

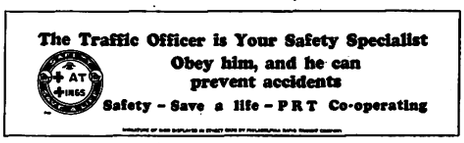

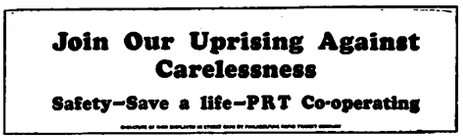

Posters and cartoons with safety messages were widely distributed during the campaign.

The cartoon entitled "The Guest of Honor" was enlarged for a window poster and more than 2,000 distributed to stores, schools and clubs.

of the Will Livelong campaign in 1927, when a decrease of 20 per cent in street fatalities was accomplished in Philadelphia, it had been hoped by those who conceived and directed the present state-wide drive that a similarly encouraging result might be obtained this year. Actually street accidents in both city and state during the period of the recent campaign, as compared with a similar period in 1927, showed an increase. The same was true of deaths resulting from highway accidents.

The explanation of the rather anomalous situation perhaps lies in the fact that a state-wide movement of any kind is of necessity cumbersome. It proved a very real problem to co-ordinate the work in various sections of the state and, to a lesser degree, in Philadelphia proper. No single organization was responsible for carrying on the unified campaign.

The Will Livelong campaign in April, 1927, had more immediate and more far reaching results, probably because it was a purely local effort; because it was financed and directed largely by a single organization and because it had a very personal and direct appeal to the individual citizen through the existence of the central character of Will Livelong, the Safety Sage.

While the Safety—Save a Life campaign officially opened on April 1, the activities in Philadelphia did not get well started until about a week later. Thus the actual working period was only about three weeks. During the Will Livelong campaign, which lasted for the entire month of April of last year, it was noted that the mounting toll of these accidents was not checked until well into the third week of the campaign. After that the curve showed a distinct falling off. It is quite possible that the Safety—Save a Life campaign would have shown a similar effect had it continued a week or two longer. It is significant that Philadelphia was the only large American city to show a decrease in its accident death rate during the year 1927. This is an indication that the safety educational work which is being carried on in that city has a cumulative effect and the emphasis given to it by occasional campaigns, such as this latest one, undoubtedly has a salutary effect.

Considering more particularly the individual work of the Philadelphia Rapid Transit Company during this campaign it is worthy of note that a distinct checking of its own accident toll resulted from the work carried on inside of the transit organization. A new safety record was established during the month of April, no fatal accidents occurring on the P.R.T. street car and high speed system throughout that period. The results obtained in April, 1927, during the Will Livelong cam-

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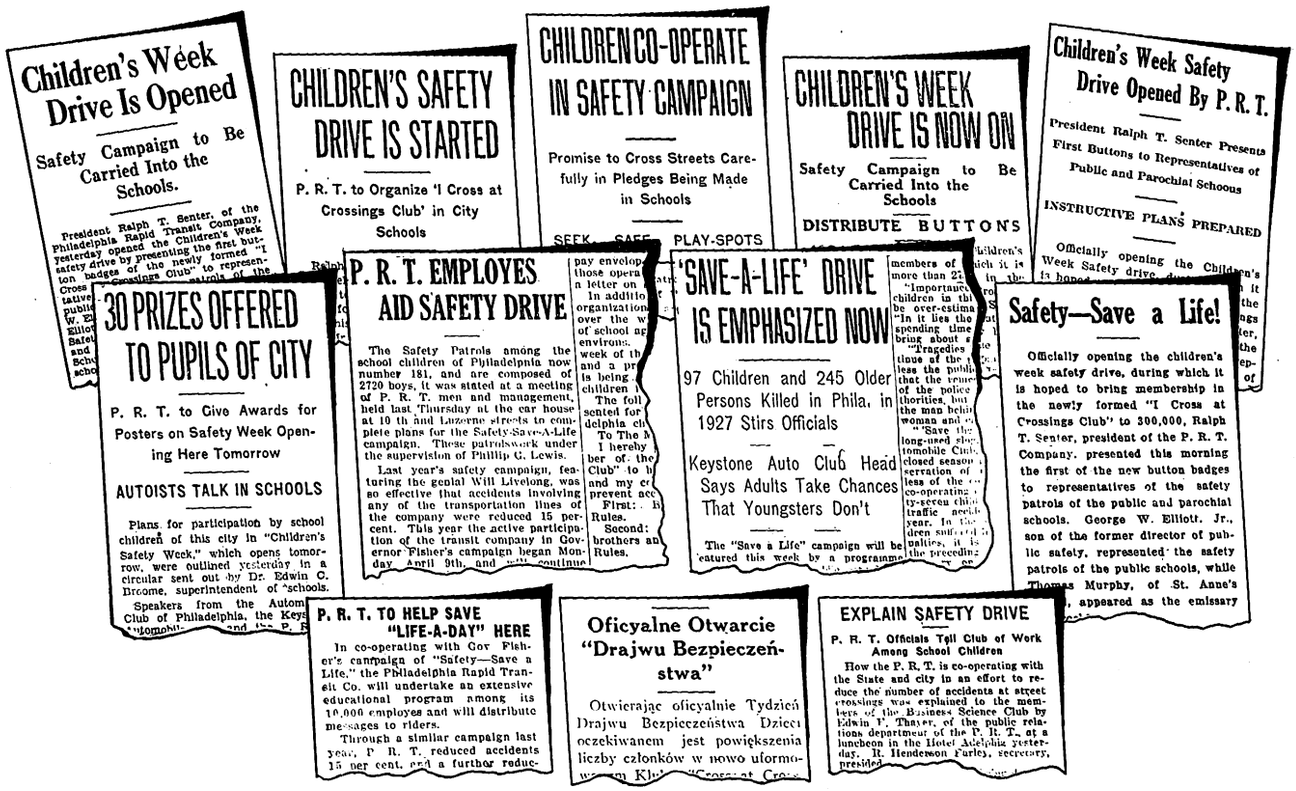

Philadelphia newspapers devoted much space to the safety campaign. The activity of the Philadelphia Rapid Transit Company in the campaign is well noted in these typical clippings

paign, were noticeable and they constituted a real mark at which to shoot. The period from April 8 to 28, inclusive, showed a reduction in all types of accidents over a similar period in 1927 of 26.9 per cent. This figure includes street car, bus, cab and elevated divisions. This record compares favorably with the per cent reduction accomplished during April, 1927, since it is naturally more difficult to better a record that is already good.

The various organizations in the city which co-operated in the Safety—Save a Life campaign included the Citizens' Safety Committee of the Chamber of Commerce, the Automobile Club of Philadelphia, the Keystone Automobile Club, the public and parochial schools, the department of public safety, the transit organization, and other civic bodies. Each assumed responsibility for a certain field of activities.

What P.R.T. Did Within Its Own Organization

The activities of P.R.T. during the campaign might be roughly classified as (1) those carried on within its own organization and (2) those which dealt with giving publicity to the matter of street safety on its cars and buses and through its speakers' bureau. The company accepted a commission from the Governor as official inspection station No. 1 for the inspecting of all types of vehicles used in street operation. A large number of these stations were established throughout the state, particularly in the various public garages. The one conducted by P.R.T. limited its activities to the inspection and certifying of company vehicles only. Every street car, elevated car, bus, cab, and truck operated as a part of the P.R.T. system carried the official seal of the State Department of Highways during the month of April. This indicated that its brakes and general equipment were in a satisfactory condition.

Accident clock dials were placed in each location of the company, showing its daily standing and the standing of the campaign to date as compared with similar periods during 1927. One of the hands was painted red and the other hand black and conscientious efforts were made by the employees to keep the hand representing the 1928 standing behind that one representing the standing for 1927. A special issue of the *PRT Co-operator,* containing a large and varied array of safety propaganda, was distributed to the 15,000 employees about the middle of the campaign.

Safety posters were widely utilized on the company bulletin boards, a special safety message from President R. T. Senter was enclosed in the pay envelope of every employee early in the campaign, the employee committeemen representing the transportation locations were assembled in a preliminary meeting and urged to spread the gospel of safety among their constituents; in short, every possible step was taken to get the idea of safety firmly implanted in the minds of all employees charged with the operation of vehicles.

Large cloth banners were placed in the various carhouses, garages, and other locations, bearing the slogan "Safety—Save a Life, PRT Co-operating." Similar banners were displayed on water tanks, building fronts, and other prominent vantage points over the system. These attracted considerable attention, both inside of the organization and out.

The spirit of friendly rivalry between various individual carhouses, bus garages, cab garages, etc., led to many "zero" days for various locations—days in which no accidents of any sort were charged against employees from those locations. One heavy downtown route, for example, has operated recently for a period of 332 days without a car collision. These local records are jealously guarded by representatives of the particular location involved.

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The week of April 8 to 14 was used as an introductory period in which dash signs bearing the legend "Safety —Save a Life—PRT Co-operating" appeared on the 3,500 cars and buses operating on the streets of Philadelphia. Various safety bulkhead and ceiling-rack signs and cab cards were used inside the vehicles. Considerable newspaper publicity was given to the proposed activities of the transit organization during the balance of the safety month.

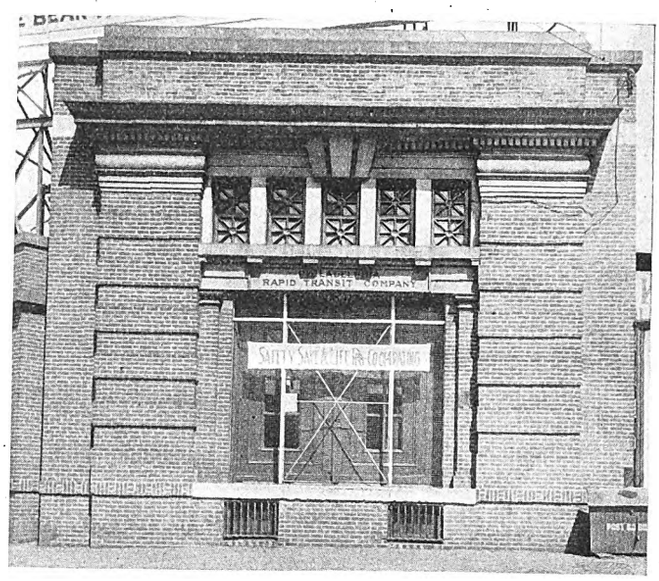
From the standpoint of the community welfare as a whole, it is probable that the single activity of P.R.T. which accomplished the greatest good was the operation of its speakers' bureau. There are somewhat more than 300 public and parochial schools in the city of Philadelphia. The company sent representatives into about 175 of these schools, giving more than 250 talks. The Automobile Club of Philadelphia and the Keystone Automobile Club also did good work in sending speakers into the schools, although neither of these organizations went into this activity to a degree equaling that of the transit system. A large majority of the school children in the city, of proper age to assimilate safety instruction readily, were reached by these speakers. The week of April 15 to 21 was designated officially as Children's Safety Week and during it a majority of the safety talks in the schools were delivered. The P.R.T. speakers, in particular, stressed the importance of forming proper safety habits while children, since habits are obeyed instinctively, and the habits of safe procedure while on the street are therefore most important.

It had originally been intended to handle the speaking work in the schools with the membership of the public speaking class conducted for P.R.T. employees. However, the requests for safety speakers were so great and such a majority of the requests were for speakers to appear before 9 o'clock assemblies, that it was utterly impossible to fill all engagements with the limited membership of the public speaking class. Therefore, additional employees and company officials were called upon, so that eventually a corps of more than 40 speakers was assembled.

The speakers had at their disposal safety charts and pictures illustrating various types of child accidents, as well as a supply of safety rules for children, pedestrians and autoists, these being distributed in all schools where P.R.T. speakers entered.

Safety stories, plays, recitations, debates and similar material were prepared and sent broadcast to the principals of all the public and parochial schools for whatever use they might desire to make of them. More than 350,000 membership buttons in the "I Cross at Crossings Club" were made and distributed to all school children in the city. President Senter of P.R.T. presented the first of these membership buttons to representatives of the public and parochial schools at the beginning of Children's Safety Week and most of the city newspapers had photographers on hand to record this event.

At the close of Children's Safety Week safety patrol flags were presented to representatives of the public school and parochial school safety



Large cloth banners bearing the slogan, "Safety—Save a Life—P.R.T. Co-operating," were prominently displayed at many points on the system

patrols by the Philadelphia Rapid Transit Company and silk American flags of the same size were presented to these representatives by the Automobile Club of Philadelphia. This presentation was held in the Mayor's office at City Hall, the flags being first presented to Mayor Harry A. Mackey, who in turn gave them to the boys. This pleasant ceremony was preceded by drills of crack safety patrols in the downtown section of the city. The P.R.T. Kiltie Band provided suitable music.

This work with the children has proved doubly satisfactory. In the first place, it is apt to be more effective and more permanent in nature with the young people than with adults. In the second place, the good-will established between the company and the children, as well as the parents of the children, is of no small value. The transit corporation is revealed as a very human and friendly organization, instead of a cold-blooded thing of business.

An additional safety activity fostered in the schools by the company during the campaign was the holding of

P.R.T.'s booth at the Philadelphia Auto Show. Safety literature was distributed here and the part played by the transit organization emphasized with posters

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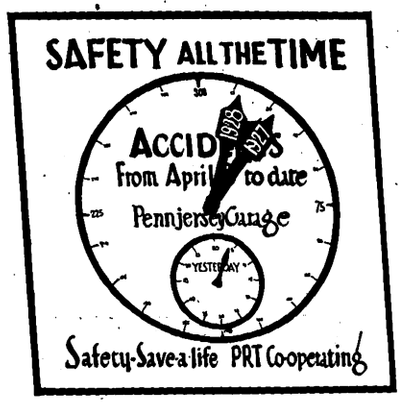
One of the billboard posters, acquainting the public with the safety drive

a safety poster drawing contest among the children in the art classes. This contest was inaugurated during Childrens' Week and was to continue for a period of one month. P.R.T. offered, as prizes for the best safety posters submitted, memberships in the Circulating Picture Club of the Philadelphia Art Alliance. These memberships went to the schools from which the winning posters came, rather than to the individual pupils. In this way a school from which a winning poster was chosen is entitled to receive twelve fine paintings during the course of the ensuing year, each painting to remain in the school for a period of one month. This arrangement was to comply with the regulation of the Philadelphia Public Schools, which states that no individual prizes may be given to school children for any contest held in the schools.

The safety cartoon entitled "The Guest of Honor," which first appeared in the special safety issue of *PRT Co-operator,* attracted so much attention that it was later reproduced on a large scale as the central theme of a window poster. P.R.T. car and bus supervisors distributed more than 2,000 of these posters to the stores and community shops. A large number were also sent to various schools and clubs.

Letters were sent to every club in the city, asking that the safety campaign be supported by resolutions, by the posting of safety pictures on the club bulletin boards, and by the provision of speaking opportunities for a safety speaker either from the club's membership or from the P.R.T. speakers' bureau. Many of the clubs responded to this appeal in one or more of the ways suggested.



Daily standings for each transportation location were shown by accident clock dials

This was practically the only other outside safety campaign activity carried on by the transit organization besides those already mentioned. The work was concentrated upon a few specific functions rather than being spread out over every field of safety activity.

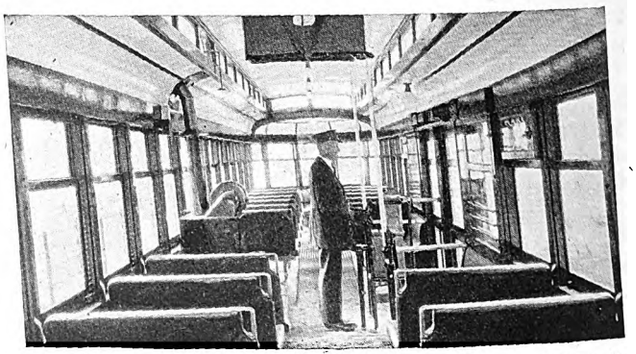
In this way it was possible to handle the transit system's part in the campaign this year with a smaller budget than was required for the Will Livelong campaign. Yet the result obtained within the organization and among the school children would seem to indicate that fully as much benefit was derived from the safety work during this past April as from that during last year's campaign.

As a windup to the activities carried on among the children, the annual Boys' Week Parade was staged on May 5, being postponed from April 28 because of bad weather. Representatives of the safety patrols marched in the parade, carrying safety banners and wearing caps provided by P.R.T. for the occasion. The 110-piece prize-winning band of the transit organization took part.

So far as the transportation system was concerned the April campaign was but a passing phase in the year-round schedule of safety work. "Bigger and better zero days" are what the entire organization is shooting for now.

A safety poster drawing contest was fostered among children in art classes. Here are four of the stencil posters submitted

Cross-Seats for 200 Detroit Trailers



Longitudinal seats have been replaced by leather upholstered cross-seats in this Detroit trail car

LEATHER upholstered cross-seats have been installed in place of the old cane upholstered longitudinal seats in one of the trail cars of the Department of Street Railways, Detroit, Mich. The change was made at low cost by reclaiming a number of seats from dismantled cars and re-upholstering them in leather. Work has been started on a similar conversion of about 200 more trailers.

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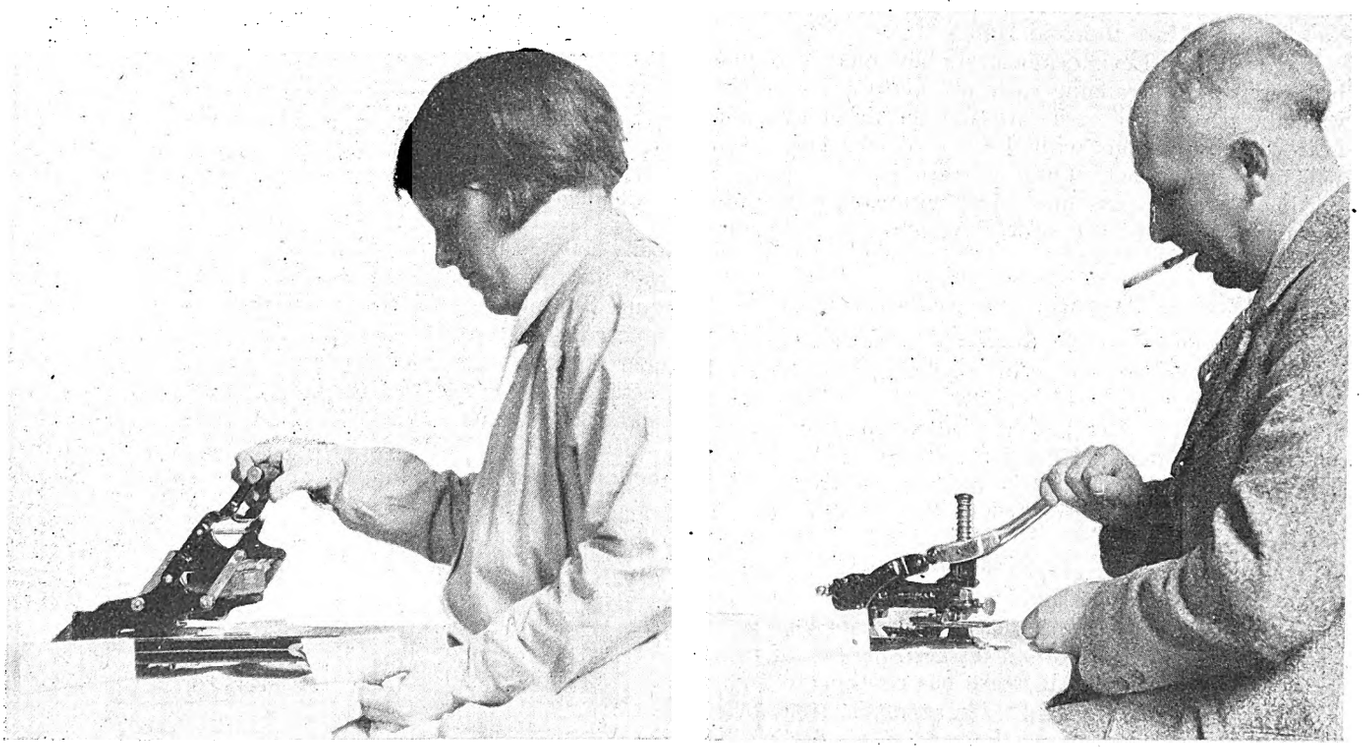
Levis Tramways Increases Revenue with Weekly Pass

Careful adjustment of the fare schedule is necessary to insure success. Cash fare and the ticket rate must bear certain relation with the cost of the pass

By H. E. Weyman
Manager Levis Tramways Company, Levis, Quebec, Canada



At left—Dating the weekly passes with a reciprocating stamper. At right—Stitching the passes together in pads

DECREASES of traffic and revenue during the first four months of 1925 caused the Levis Tramways, Levis, Quebec, Canada, to install the weekly pass. The company had studied the pass system carefully and was ready to adopt it when circumstances proved that something should be done to stimulate traffic and to counteract the effect of the private automobile. The railway system is a suburban one with terminal loading and unloading at the Quebec Ferry, and therefore not a particularly favorable one on which to use a weekly pass. The management, however, decided that with careful adjustment of rates of fare it could be made to pay, and consequently adopted it.

At first a $1 pass was used with the cash fare of 10 cents and the ticket fare of four for 30 cents on the two single-zone routes within Levis. The sales of the first four weeks were about 15 per cent of the total revenue. In the week of July 12, 1925, the same pass was made effective in the first or Levis zone of the third route, the one extending to the Quebec Bridge. The sales immediately increased 24 per cent. It was gratifying to learn that satisfied patrons were telling others of the new system and to such an extent that riders in the second zone were soon asking for a pass.

Effect of Ticket Combinations on Weekly Pass

The request from the second-zone or St. Romuald riders for a pass offered the opportunity to make a bargain. The public wanted a weekly pass and the company wanted to sell strips of tickets that would not be too easy for a casual rider to obtain. The company arranged with the municipal authorities for the sale of six tickets for 45 cents instead of four for 30 cents, the public agreeing to this alteration in exchange for a $1.75 pass to go into effect in November, 1925. The first week's sale of the new pass was only 42, but in a short time the number more than doubled. Also the number of cash fares of 10 cents per zone increased 30 per cent during the first week, a most gratifying increase. This experience proved convincingly that the most profitable use of a weekly pass

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TABLE I—DISTRIBUTION OF PASSENGERS ACCORDING TO FARE USED, IN PER CENT

	1924	1925 (Pass Used Seven Mos.)	1926	1927	1928 (Three Months)
Cash	13.3	11.5	13.3	13.0	11.2
Tickets	86.7	68.4	48.4	44.6	42.0
Passes	....	20.1	38.3	42.4	46.8

occurs when the ticket is not made too accessible for those who are really casual riders on the one hand or who might be regular riders with the pass on the other hand.

It may not seem that 45 per cent is a large enough investment to deter fairly good riders from using tickets, especially when the tickets are sold on the cars, Yet it is a fact that tickets in strips of six or eight tend to make the regular rider a better and more profitable one by using the convenient pass, while casual riders accept the dime cash fare to avoid bother.

The results in Levis demonstrate how much care must be exercised in arranging cash and ticket rates to work with the pass. The cash fare and the ticket rate must bear certain relations with the pass or the best results will not be obtained. Quite often one sees a property putting a weekly pass into effect with no consideration for the remaining fare scale. As a result the pass is usually a failure.

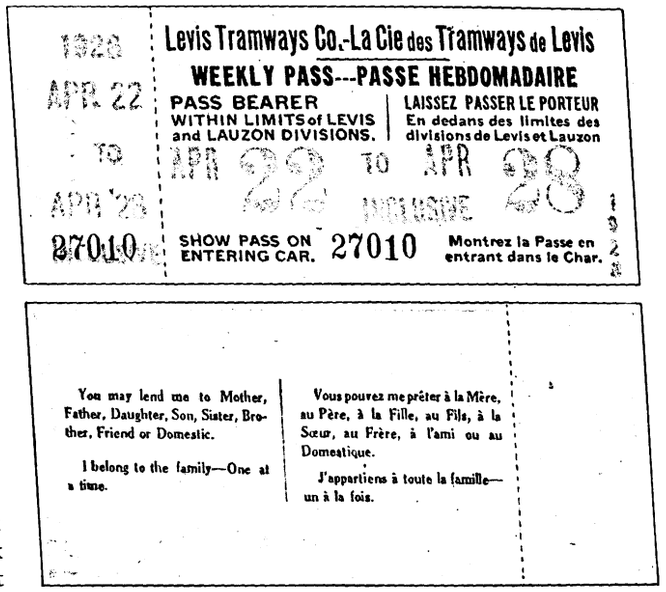
Ratio of Pass Revenue to Total Rises

The opening sale of the first or $1 pass was 250. This same pass, with no change in privileges, attained a sale of 718 in the week of March 18, 1928. In like manner the two-zone or $1.75 pass has advanced from 42 to a winter sale averaging 90 and a summer sale as high as 130. The outstanding fact is that revenue from prepaid users of the pass has risen from 15 to 26 per cent of the total revenue.

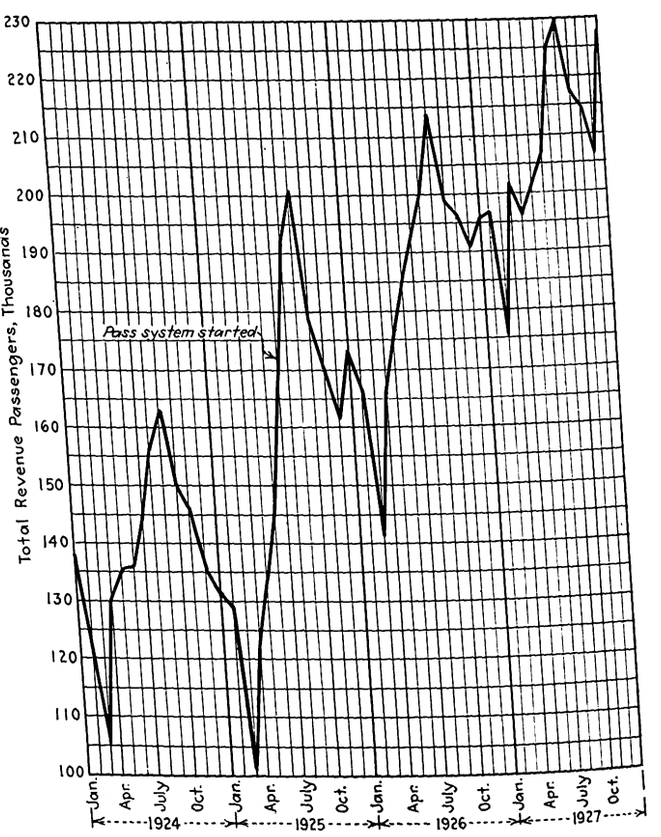
The accompanying graphs show the revenue received from cash fares, tickets and passes. It will be noted that cash fares showed an immediate increase as soon as the sale of tickets in strips of six replaced the sale of tickets in strips of four. The increase has continually been in evidence since the change. The revenue from tickets sold shows a decline due to the pass. This decline indicates that the ticket rider has been converted to a pass owner, paying more than he did for the tickets but enjoying more convenience. The revenue from passes varies from month to month, as some months are credited with five weeks and others only four. However, the gradual increase in the sale is well demonstrated.

Transferability of the pass has caused no loss of cash fares that might have been paid otherwise by members of the pass holder's family. Cash fares increased from 295,851 in 1926 to 324,781 in 1927 at the very time that the tickets decreased from 1,078,301 to 1,065,182. The pass and cash sales tend to advance at the same time because pass holders prefer to pay the dime fare to purchasing six tickets for 45 cents.

When the weekly pass was first mentioned the company actually feared it. The many possibilities of misuse and the thought that increased car service would be required to take care of the pass riders caused an unfavorable reaction toward its adoption. However, it was felt that the pass would be worth while in making fare collections more convenient for both operators and patrons, and that it would serve as a good will measure.



At top—Face of one of the printed weekly passes used by the Levis Tramways. At bottom—Reverse side of the same pass showing one of the slogans used



Total passengers by months for the years 1924 to 1927, inclusive. The total has climbed steadily since the introduction of the weekly pass

TABLE II—DISTRIBUTION OF TOTAL REVENUE WITH RESPECT TO TYPE OF FARE, IN PER CENT

	1924	1925 (Pass Used Seven Mos.)	1926	1927	1928 (Three Months)
Cash	17.8	17.4	22.3	22.8	20.3
Tickets	82.2	73.0	56.9	51.5	51.8
Passes	....	9.6	20.8	25.7	27.9

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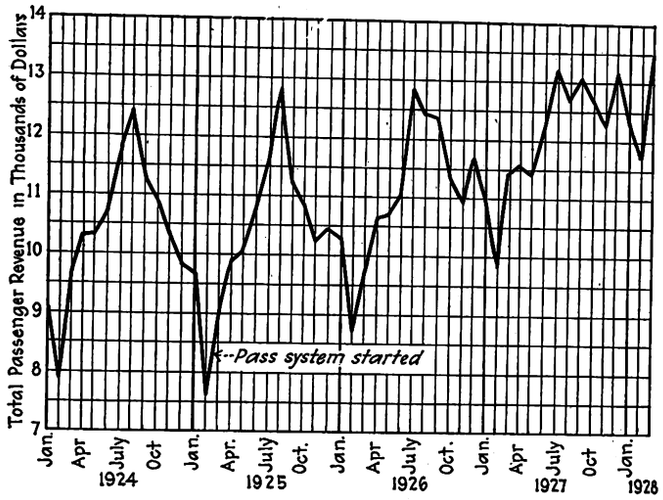
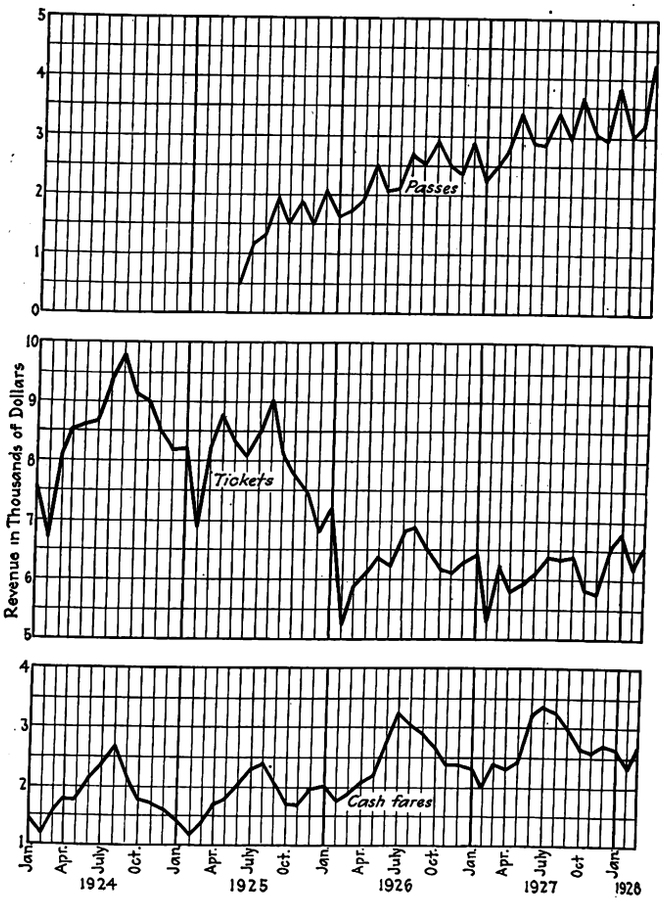


Total revenue by months for the period from January, 1924, to February, 1928, inclusive. It is significant that the pass has caused a large increase in revenue as well as in number of passengers carried

averaged despite the theoretical unlimited service. An average of about 2½ through rides a day has been maintained practically since the start. To avoid possible abuse of the pass the following was printed on the front of each one:

Pass must be shown to car operators and inspectors upon entering car and is good for only one passenger on any given trip and must remain in possession of passenger during trip. Any attempt to misuse pass renders it void. Company reserves the right to cancel the pass system at any time.



Revenue by months for the period from January, 1924, to February, 1928, inclusive, from passes, tickets and cash fares. While revenue from tickets has declined the revenue from both passes and cash fares has increased

On the back of the passes the following information was printed:

The issue of this pass constitutes an attempt by this company to provide a method whereby the general public can obtain cheap fares. In other words, it is an attempt to sell "transportation at wholesale rates." Any person attempting to illegally use this pass in any way will be arrested for fraud.

Prosecution of the few persons who did misuse the pass soon put an end to the practice. The public approved of this policy for it appreciated that the pass was instituted for its benefit.

Cheaper Paper Now Used for Passes

Bearing on the question of fraud with the pass, a simpler and cheaper pass is now used. The original card showed all the months of the year and had date spaces, so that it could be punched to show the week of use. The simple printed pass, shown in one of the accompanying illustrations, is now used. The tickets are printed in large quantities with blank spaces for the date. They are of different colors and have serial numbers. Previous to any week's sale the passes are dated with a reciprocating stamper. The passes are then put up in pads of five, ten or fifteen, with a stub carrying the printed serial number and the stamped date. The machines for dating and binding the passes are also illustrated. The backs of the passes are used for company publicity and bear advertising slogans.

The success of the pass plan, perhaps, may be credited to the whole-hearted manner in which the system was put into effect. Every channel of salesmanship and publicity that was suggested or could be thought of was used, and as a result every prospective buyer of the pass was informed of the plan. The management feels that if Levis had half a dozen theaters instead of one, with night schools, ballrooms, lecture halls and the like in addition, the publicity program would have been still more successful.

Railway Wages Increased 3 Per Cent Between 1926 and 1927

WAGES for motormen and conductors in 44 of the larger cities of the country are tabulated for two years in the "Bulletin of Labor Statistics" for March, 1928. The dates selected are May 15, 1927, and May 15, 1926. The average increase between these two dates was 3 per cent. Twelve industries were considered and the electric railways were one of the six whose hourly wage rate increased during the year. The others were the bakers, building trades, chauffeurs and teamsters, book and job printing and publishing, and newspaper printing and publishing. On the other hand, four trades showed decreases in hourly wages during this period, namely, granite and stone cutters, laundry workers, linemen and longshoremen. The two industries covered in the report but not listed as increasing or decreasing were barbers and bus drivers. The barbers' wages could not be compared on an hourly basis. A table is published of wages of bus drivers from 27 cities as of May 15, 1927, in general, the bus lines listed are those affiliated with the electric railways in the cities covered. Corresponding data were not collected in 1926.

The number of men included in the electric railway group were: motormen and conductors, 57,289, and in the bus group were bus drivers, 2,730.

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Cleveland Light Metal Car Uses Less Energy

Energy saving from reduced weight, as compared with the same car when built of steel, amounts to more than 17 per cent

Tests made with the aluminum car of the Cleveland Railway, No. 1376, have shown a considerable reduction in energy consumption owing to its lower weight. The car is of the company's standard "pay-pass" design, with one large entrance door in front and two exit doors at the center, known in Cleveland as the "1300 type." It was built some two years ago and was a conspicuous feature of the 1926 Convention exhibit in Cleveland.

The car is 51 ft. 2 in. long over bumpers and weighs, with equipment, 30,300 lb. The weight of a steel car of the same design and equipment would be 43,200 lb., so that the use of aluminum alloys effects a saving of about 12,900 lb. Full particulars of the structural features of the car were published in ELECTRIC RAILWAY JOURNAL for April 9, 1927, page 655.

The car was put in service Dec. 2, 1926, and a daily record has been kept of the car-miles made by it and the kilowatt-hours used. During part of this time the car has been used as a single unit and during another part of the time it has hauled a trailer. It began in train service, and from Dec. 2, 1926, to January 11, 1927, an additional 60 per cent in mileage was credited to it to allow for the extra energy taken in pulling a trailer. On this basis the following results were obtained:

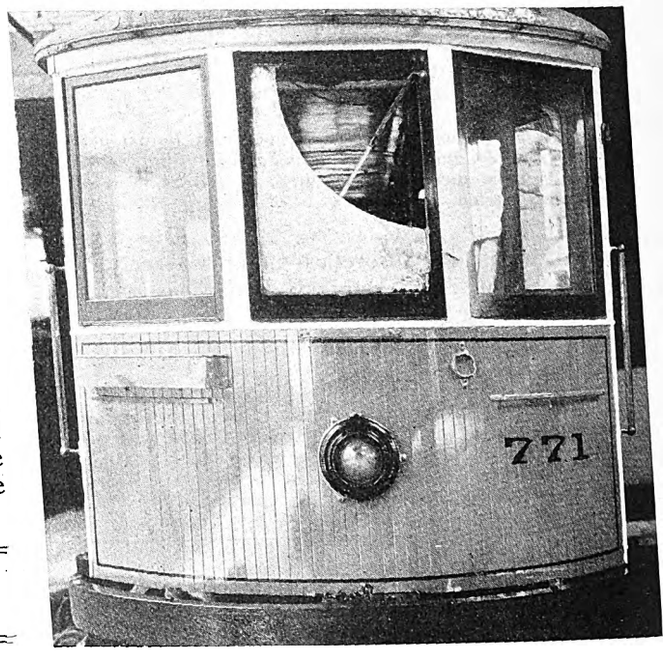
Kilowatt-hours consumed	11,084
Car-miles run	4,864
Kilowatt-hours per car-mile	2.27

On Jan. 11, 1927, those in charge of the test began to keep separate readings, one set to be while the car was being run as a single unit and one set while it was being operated as a leading car of a two-car train. At the same time, the company decided to keep daily mileage and energy consumption records of three other cars of similar design but built of steel, operating over the same route under the same conditions. The results of this test up to the end of March, 1928, appear in the accompanying table.

It will be noticed that figures for per cent saving during January and February, 1928, are quite low compared with other figures in the same column. This is due to the failure of the trainmen to separate the records for the aluminum car in single unit and train operation. This has now been corrected, and the figure for per cent saving is moving back to normal.

Window Wipers Speed Operation

REGULAR passenger cars of the Connecticut Company, New Haven, Conn., have been equipped recently with window wipers. The management believes that this will have two advantages: it will reduce the accident hazard by giving the motorman clearer vision in stormy weather, and it will also permit closer adherence to schedules at such times, by relieving the motorman of the necessity of stopping the car every few minutes to clean off the glass of the front window. The wipers are of the swinging arm type and clear a large area of the glass. They are manually operated, as it is thought that such mechanism is more rugged and reliable.



Window wipers on cars of the Connecticut Company clear a large area of the glass in front of the motorman

Orders were first placed by the company for a few wipers for trial. These proved so satisfactory that orders were entered for enough to equip the remaining cars. A total of 947 cars have been equipped, making this the largest installation of the kind yet made.

COMPARISON OF ENERGY CONSUMPTION ON CLEVELAND RAILWAY ALUMINUM CAR 1376 WITH STEEL CARS 1370, 1371, 1372

	Aluminum Car 1376 — As Motor			Aluminum Car 1376 — As Train			Steel Cars 1370, 1371, 1372			
Month 1927	Kilowatt-Hours	Car-Miles	Kilowatt-Hours per Car-Miles	Kilowatt-Hours	Car-Miles	Kilowatt-Hours per Car-Mile	Kilowatt-Hours	Car-Miles	Kilowatt-Hours per Car-Mile	Per Cent Saving
January	3,210	1,450	2.21	3,108	846	3.67	38,270	13,711	2.79	20.4
February	4,695	2,348	2.00	2,623	746	3.52	38,085	14,166	2.69	25.7
March	4,682	2,414	1.94	2,535	674	3.76	42,550	15,938	2.67	27.3
April	6,448	3,266	1.97	4,022	1,059	3.80	42,914	16,419	2.61	24.5
May	4,897	2,474	1.98	2,386	627	3.81	43,108	17,068	2.53	21.8
June	5,706	2,850	2.00	3,290	809	4.06	21,289	8,237	2.58	21.3
July	6,036	2,990	2.02	2,639	676	3.91	31,020	11,940	2.60	22.3
August	3,941	1,760	2.24	2,152	554	3.88	39,534	14,505	2.73	17.9
September	.....	.....	.....	.....	.....	.....	40,760	15,544	2.62	.....
October	3,904	1,432	2.16	1,640	389	4.11	39,693	15,194	2.61	17.2
November	4,342	1,832	2.37	2,531	600	4.22	39,399	14,758	2.67	11.2
December	5,487	2,222	2.47	2,686	613	4.38	46,414	16,475	2.82	12.4
1928										
January	7,416	2,872	2.59	3,309	709	4.95	48,736	17,512	2.78	6.8
February	3,430	1,298	2.64	1,111	244	4.55	42,886	15,634	2.74	3.7
March	5,829	2,472	2.35	2,133	457	4.66	42,250	15,971	2.65	11.3
Total	70,023	31,680	2.21	36,165	9,003	4.02	598,908	223,072	2.68	17.6

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The Readers' Forum

Further Analysis of Car Heating Costs

CHICAGO SURFACE LINES,
CHICAGO, ILL., April 30, 1928.

To the Editor:

I have read the article by A. W. Baumgarten in the April 21, 1928, issue on the subject of cutting heating costs by recovery of energy from dynamic braking. This article has been of particular interest inasmuch as we have been studying the same problem for some time past and have been unable to estimate a saving of such magnitude as indicated by Mr. Baumgarten.

Mr. Baumgarten's figure for average miles per car per day, 180, is rather high for city service. We only average about 103 miles per car per day, or less than ten hours at 11 m.p.h. schedule.

The total heat required per month will, of course, vary from day to day, and the average car cannot be expected to be in service every day in the month as indicated by Mr. Baumgarten's figures. For purposes of comparison, full day months will be used, however.

The kilowatt-hours required to heat a car per day will necessarily vary with conditions, such as loading, outside temperature, use of storm sash, elimination of heat wastage through windows, doors, etc.; thermostat setting and ventilation. A lengthy article in the Sept. 30, 1922, issue of the JOURNAL covered this subject thoroughly. It has been found that electric heating can maintain our cars in service at a temperature of 52 deg. F., which is our thermostat setting, with an expenditure of energy as shown in the accompanying table.

Outside Temperature, Deg. F.	Kilowatt-Hours per Hour of Operation	Kilowatt-Hours per Car-Mile Based on 11 M.P.H. Schedule
50	0.3	0.027
45	1.0	0.091
40	1.4	0.127
35	2.2	0.20
30	2.6	0.236
25	5.3	0.48
20	6.9	0.627
15	8.3	0.755
10	9.6	0.873
8	10.7	0.974

These figures are for a closed wood-body, double-truck car, 49 ft. 2 in. over bumpers, equipped with bulkheads, storm sash for winter use, having adequate ventilation and with seating accommodations for 40 passengers. Electric heaters rated at 8.8 kw. at 500 volts are installed, and have sufficient capacity to maintain a temperature rise of 40 deg. F. in service, as required by city ordinance. This contrasts somewhat with Mr. Baumgarten's statement of 13 kw. required to secure 35 deg. rise.

For the cost of hauling additional weight we prefer a figure of 0.05 to 0.06 kw.-hr. per mile per 1,000 lb. for energy alone used in transportation, as this is more readily applicable to any property than any arbitrary figure of cents per year. It takes into consideration average miles traveled as well as local cost of power. Based on 37,593 car-miles per year and 1.25 cents per kilowatt-hour as applied to our local situation this amounts to 2.58 cents per pound per year.

In order to make a direct comparison, I obtained the government temperature record for Chicago for the months given in Mr. Baumgarten's paper and find that 6,478 kw.-hr. would maintain the temperature of one of our cars at 52 deg. F. for ten hours service each day, for a period of 168 days. This is shown in detail in the following table:

Month, 1924	Number of Days During the Month at Which the Average Temperature in Deg. F. Was:										Kw.-Hr. per Car*
	8	10	15	20	25	30	35	40	45	50	
January.....	8	1	6	3	3	2	4	3	1	0	2,028
February.....	0	0	0	5	6	8	8	2	0	0	1,155
March.....	0	0	0	1	1	10	10	5	3	1	805
April.....	0	0	0	0	0	1	1	2	8	7	247
November....	0	0	1	0	2	3	5	8	3	5	564
December....	6	2	2	1	6	6	3	4	1	0	1,736
Season.....	14	3	9	10	18	30	31	24	16	13	6,478

*Total kilowatt-hours per car for the month required to maintain a temperature inside of 52 deg. F. for ten hours of service each day.

It would appear that the car mentioned in the table was heated during the same season outlined in Mr. Baumgarten's article at a cost to our company of $81, or $375 less than the cost for heating Mr. Baumgarten's car. The cost of energy for heating is, therefore, the most important factor in a determination of whether an installation of this type would be economical or not, as the above difference in cost is greater than the estimated $301 saving.

On Mr. Baumgarten's temperature curves the temperature rise continually grows smaller from 3 p.m. to midnight. For the five hours 7-12 p.m., a rise of approximately 28 deg. is maintained. In his article the average return of power is seen to be 8 kw. or 3.5 deg. rise per kilowatt of heater input. On our cars, mentioned above, we obtain approximately 4.55 deg. rise per kilowatt input and Mr. Baumgarten's older cars indicated 35 deg. rise with 13 kw. input, or only 2.7 deg. rise per kilowatt. Mr. Baumgarten's temperature curves would indicate that whenever the temperature falls below 22 deg. F. outside, auxiliary heat would be required in addition to that obtained from dynamic braking in order to maintain a temperature of 50 deg. F. in the car. In the season under consideration there were 36 days for which the outside temperature was below 20 deg. F. out of the total of 168, or 15.5 per cent. Some additional heat supply would be necessary for this. Mr. Baumgarten's article states: "The car was put in regular service at 5:30 a.m. with an inside temperature of 40 deg. F. obtained with the auxiliary heaters, and an outside temperature of about 12 deg. F." From his curves we read a rise of 28 deg. at 2:30 a.m. and a rise of 30 deg. at 5:30 a.m. or 2 deg. increase as a result of 5 kw. for three hours.

In our study of resistor heating of cars we have considered three distinct types or classes of utilization:

1. Inclose present grid resistors with ventilated box leading into duct in car.
2. Additional resistor heaters within car body for use as accelerating resistors.
3. Additional resistor heaters, control and motor capacity for rheostatic use in acceleration and braking.

The first plan is by far the simplest and while we consider it only 60 per cent efficient, the first cost is only

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$125, the additional weight 200 lb., and it is worth 5-10 kw. of heat, depending on installation and service, with an estimated saving of $28.75 per car per year obtained, at a cost of $18.60, or net saving of $10.15.

The second plan, while 100 per cent efficient, involves $550 and 612 lb. additional cost and weight for 40 per cent of the heat required. A maximum saving of $46 is obtainable at a cost of $69 for fixed charges and $14.40 for energy for hauling extra weight.

The third plan would furnish all the heat required, at a saving of $115, but would require the following additions:

	Cost	Weight, Lb.
Heaters	$840	680
Control	440	470
Motors	160	80
Total	$1,440	1,230

Fixed charges of $180 and energy cost for transportation of about $30 would indicate this to be an uneconomical installation.

In conclusion it might be said that performance as outlined in Mr. Baumgarten's tabulation might be obtained for a single car, even to the excessive cost for energy consumed for heating, and if his cars require this much energy and an average of 180 car-miles per day for each day in the month is obtained, then it is entirely probable that it would be profitable to equip cars for the utilization of this waste energy. But we cannot expect that every property can show such savings and the individual economic factors must be determined for the installation under consideration.

W. C. WHEELER,
Engineer of Equipment.

NOTE—According to the custom of this paper, the above letter was submitted to the author of the article for such comments as he desired to make. Mr. Baumgarten has made a thorough analysis of the points raised by Mr. Wheeler, to which he has replied to in detail. His letter is printed below.—EDITOR.

CHICAGO & JOLIET ELECTRIC RAILWAY
JOLIET, ILL., May 19, 1928.

To the Editor:

With further reference to the article by the writer as published in the April 21, 1928, issue on the subject of energy savings from dynamic braking and heating, there appears to be some misunderstanding with regard to the data given in this article and particularly with respect to the costs and possible savings on other properties. With this in view, it seems necessary to explain further in detail how these figures were arrived at and point out particularly that the analysis given pertains only to the property of the Chicago & Joliet Electric Railway and that, in order to arrive at savings that might be effected on other properties, certain factors and conditions must be changed. This is true of the analysis of Mr. Wheeler's comments regarding the article appearing in the April 21 issue.

In the comparisons made by Mr. Wheeler, he has endeavored to reconcile the figures given with those of the Chicago Surface Lines, which cannot be done, inasmuch as practically no small properties enjoy the low power rates and low average mileage per car as those obtained in Chicago. It will be noted that Table III of the April 21 issue was based on 180 miles per car per day, 150-day heating season and thermostat control set at 60 deg. This was based on the full number of miles per day of cars in service and not on the average miles per day of all city cars. If, as Mr. Wheeler mentions, the Chicago cars are in service less than ten hours per day, then the total equipment in use is a little over 50 per cent. On most smaller properties the average hours in service would be considerably more than this. On the Chicago & Joliet Electric Railway, the average service of all city cars is fourteen hours per day. However, the figures given in Table III are based on actual operation and metered energy over the period as shown and must be taken on the basis of 180 miles per car per day, 60 deg. thermostat setting and 150-day heating season. The heating season, however, is usually longer than this and, for the period shown, was actually about 168 days.

Referring to the table showing the variation of kilowatt-hours per hour of operation, with outside temperature as shown in the first of Mr. Wheeler's tables, it will be noted that the variation between different temperatures is neither uniform nor consistent. Plotting these figures, we find that there is a straight line variation from 35 deg. outside temperature to 8 deg. outside temperature, or the kilowatt-hours per hour of operation per degree change in temperature is 0.315 between the temperatures of 35 deg. and 8 deg. It appears that the figures given above 35 deg. were entirely off of the curve when plotted. This curve should be a straight line variation starting at 52 deg., or the thermostat setting noted. On this basis, the energy per car per hour should be as follows:

Outside Temperature, Deg. F.	Kilowatt-Hours per Hour of Operation 52 Deg. Thermostat
50	0.65
45	2.20
40	3.78
35	5.35
30	6.92
25	8.50
20	10.20
15	11.70
10	13.20
8	13.90

Taking the average of 190 kw.-hr. per car per day and correcting this figure for a 168-day heating season with an average heating season temperature of 31 deg., we obtain a figure of 0.326 kw.-hr. per hour of operation per degree change of temperature. This compares very favorably with the figure of 0.315 kw.-hr. per hour of operation per degree change of temperature obtained from the plotted curve of the figures between 35 deg. and 8 deg. outside temperature given by Mr. Wheeler.

If this is true, then to maintain a temperature rise of 40 deg. F. in service, as required by city ordinance referred to by Mr. Wheeler, would require a capacity of 12.6 kw. The old cars on our property, with a capacity of 13 kw., would not maintain 60 deg. temperature when atmospheric temperatures were below 25 deg.

The cost of hauling weight per year of 4 cents per pound would probably not hold true on other properties and, expressed in other terms, comes to about 0.0625 kw.-hr. per car-mile per 1,000 lb.

The average temperature for the heating season, based on the temperatures given in the second table in Mr. Wheeler's comments, shows an average of 31 deg. for the season of 168 days. This would require an average temperature rise of 21 deg. with a thermostat setting of 52 deg. On the basis of 0.315 kw.-hr. per degree change of temperature and ten hours per day operation and a 168-day heating season, we would obtain 11,100 kw.-hr. per car per year for electric heat which, at a cost of 1.25

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cents per kilowatt-hour, would amount to $139 for energy only.

With reference to the chart in the article in the April 21 issue, page 650, showing the car temperatures obtained in the car on March 5, 1928, we wish to emphasize that this is only a typical temperature curve taken with the recording meter in the car on that particular day. Therefore, the difference between outside temperature and car temperature does not indicate the maximum temperature obtainable from dynamic braking and resistor loss heating, but does show that it is possible to expect an average rise of 30 deg. to 35 deg. within the car. It will be noted also that the average return of power from dynamic braking only may be as high as 8 kw. To this must be added the heat of starting resistor loss, which is about 20 per cent of the power input to the car, making a total of approximately 13 kw. power return to the car. It is not possible to know accurately the average actual kilowatts return of power to the car with this dynamic braking and resistance loss heating. However, on the basis of season heating tests on the older cars, we obtained a temperature rise of 3.06 deg. per kilowatt input. And, since we have obtained an average temperature rise in the new car of about 30 deg. to 35 deg., it is reasonable to suppose that the average power return in heat is between 9.8 kw. and 11.4 kw. The amount of this energy return is entirely dependent on the scheduled speed, stops per mile and grades on which the car operates.

We have found that in general the auxiliary heat is not used when atmospheric temperature is above 15 deg. F. Therefore, the total number of days during which auxiliary heat would be operating would not be more than 10 per cent or 12 per cent and the heat of 3,000 kw.-hr. per car per year, as given in Table IV of the April 21 article, is sufficient to take care of this 10 per cent and additional two hours auxiliary heating required in the morning before the car is put in service. One point not explained in the article and which may be noted in the temperature curve obtained on March 5, is that the resistor heaters retain their heat for some considerable time. It will be noted on the typical chart of March 5 that the car temperature dropped only 10 deg. from 12 o'clock midnight to 2:30 a.m., at which time the chart was changed and auxiliary heat was turned on. The car was out of service at 12 o'clock midnight.

In analyzing the three types of heating enumerated in Mr. Wheeler's comments, it is stated that the resistor accelerating heat "is worth 5-10 kw. of heat depending on installation and service, with an estimated saving of $28.75 per car per year." If a minimum of 5 kw. of heat can be obtained from starting resistors on a basis of ten hours per day, 168-day heating season and 1.25 cents per kilowatt-hour, the total energy saving would be about $104 and, with 60 per cent efficiency, would be an estimated saving of $62.40 instead of $28.75.

In the second plan, with the additional resistors within the car body, this would give a minimum saving of $104 or a maximum saving of $208.

By the use of dynamic braking and starting resistor loss heat, it would be possible to obtain all of the energy required for heating and, as mentioned previously, with a thermostat setting of 52 deg. and an average seasonal temperature of 31 deg., this saving would be $139, based on an energy cost of 1.25 cents per kilowatt-hour. During the heating season and with electric heat it is invariably true that the peak demand occurs on the days of lowest temperature and, therefore, the demand charge for the electric heat would be about 12 kw. The cost of this demand charge, in the case of this company, would be about $152 per car per heating season, and the energy cost, based on fourteen hours average car operation, would be about $156, making a total energy cost per car per year of $308. Mr. Wheeler has not explained in his comments as to whether the 1.25 cents per kilowatt-hour takes care of this additional demand charge. Some years ago this company abandoned the use of electric heaters and the maximum demand for the year was reduced about 400 kw. at a total saving of $7,200.

In making comparisons of savings, Mr. Wheeler has not taken into consideration the additional substation equipment capacity required where electric heaters are used. It is reasonable to suppose that, with 12 to 15 kw. heater capacity per car and with maximum demand practically always occurring on the coldest days, it would be necessary to provide at least 15 kw. capacity in substation equipment per car in service during peak load hours. Therefore, with electric heat there will be an investment in the substation which is comparable to the total investment per car with dynamic braking and resistor heating. The substation capacity of this company since the abandonment of electric heat a number of years ago has been reduced 250 kw. and, with the installation of new substations, has effected an investment saving of $500 per car in city service.

In conclusion, analyzing the costs of electric heating based on *average* cars in service, it is estimated that the savings per car per year would be not less than $250. And, based on *actual* cars in regular schedule service, the figures as outlined in my article are conservative, inasmuch as savings in substation investment and maximum demand charge are not taken into consideration.

Referring to Mr. Wheeler's analysis of electric heating versus dynamic braking and starting heating, he has not considered the fixed charge of electric heating but has based his net savings on energy saving only. This does not give a true comparison. Also, if storm sash and other means of insulation are used on the car for the conservation of energy with electric heating, this additional investment must be charged against electric heating cost. Furthermore, in my article we have considered only the savings to be effected in heating cost and have not given credit to the dynamic savings of brakeshoe wear and maintenance cost, which would be an appreciable item, and other indirect benefits to be derived from the braking. In actual service, it has been found that dynamic braking is sufficient for about 90 per cent of the total braking in making service stops, so that if this method of braking is only used during the heating period, we might expect about 40 per cent saving in brakeshoe maintenance and wear. If this method were extended to both summer and winter use, the saving would be considerably greater. Where the dynamic braking and heating are only used during winter periods, we believe it is safe to assume that additional motor capacity is not required inasmuch as the cooling of the motors would be much more rapid during the cold weather.

Taking all of these things into consideration, it is true that the saving effected on this property would not be the same on other properties and each case must be analyzed from the basis of service, number of cars and energy costs on the property in question. However, we believe that the possible savings shown on this property are conservative and that, if all items are taken into consideration, they eventually might even be greater.

A. W. BAUMGARTEN,
Division Engineer.

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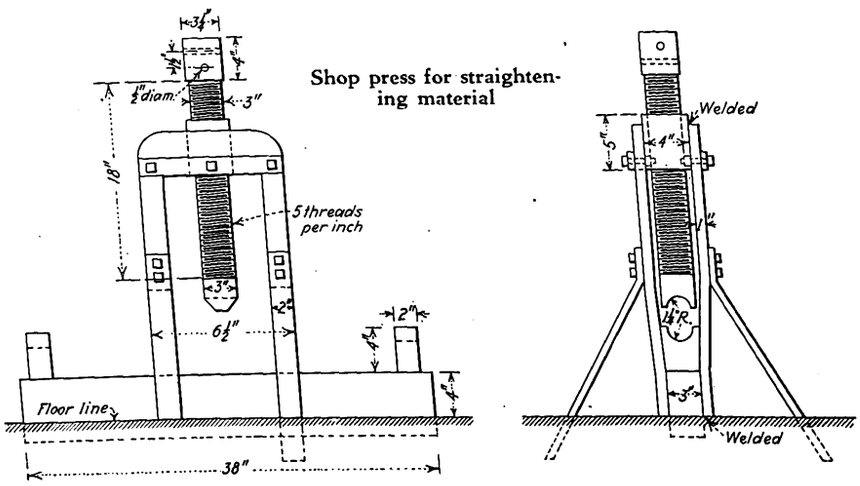
Maintenance Methods *and* Devices

Screw Press for Straightening Bars and Rods

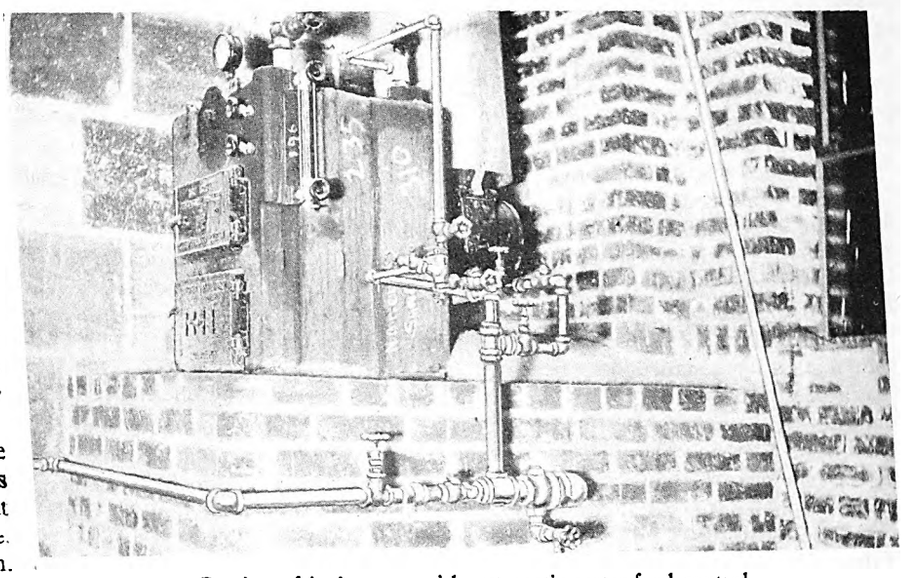
ANY PRESS is a very handy tool to have in a shop, especially when it can be used for straightening bars, rods, etc. The press shown in the accompanying illustration is used by the New York & Harlem Railroad, New York City, and was designed and constructed in its shop. Although it is used for straightening plow bars primarily, it can be and has been used for straightening many other kinds and shapes of metal.

A steel bar 38 in. long, 3 in. wide and 7 in. thick is used as a base and is embedded in the concrete floor so that 4 in. of it projects above the surface. Two 2x3-in. fulcrum blocks 4 in. high are welded to the base, each about 1 in. from either end. The top surface of these blocks is concaved to correspond to a radius of $1\frac{1}{4}$ in. Two 1x2-in. V-shaped uprights are welded and bolted to a threaded casting of 4 in. diameter, 5 in. long and the lower ends welded to the base. One end of a $\frac{1}{2}$x2-in. brace is bolted to one of these uprights on either side and the other embedded in the concrete floor. These braces provide additional rigidity. A screw of 3 in. diameter and 18 in. long is installed in the threaded casting. One end of this screw is designed with a head of $3\frac{1}{4}$ in. diameter, 4 in. high and is provided with two $1\frac{1}{2}$-in. diameter holes drilled diametrically opposite on $1\frac{1}{2}$-in. centers for reception of a leverage bar. The other end is provided with a pressure head 3-in. diameter, 3 in. long and concaved at $1\frac{1}{4}$ in. radius. The screw is designed with five threads per inch.

This machine has been found very serviceable and has not failed to produce the results for which is was designed.



Shop press for straightening material



Portion of incinerator with automatic water-feed control

Incinerator Provides Steam for Shop Use*

By Charles Herms

General Foreman, San Diego Electric Railway, San Diego, Cal.

CONSIDERABLE rubbish and scrap lumber must be disposed of around electric railway repair shops, creating more or less of a problem on most properties. As a convenient means of getting rid of this, the San Diego Electric Railway has built an incinerator in such a manner as to supply heat to a 15-cu.ft. capacity steam boiler. The steam is used for various cleaning purposes around the shop. It also furnishes heat to the paint shop.

The fire-box door is on the outside wall of the building. This is not shown in the accompanying illustration. The boiler has an automatic water-feed control so that no attendant is required.

Motor Leads on Axle Side Reduce Trouble*

By R. T. Chiles

Master Mechanic, Cumberland County Power & Light Company, Portland, Me.

TO REDUCE failures of motor leads from rubbing and short circuiting, the Cumberland County Power & Light Company brings the leads out on the axle side. Inside-hung motors are used on the company's standard type safety cars. With this arrangement during the year 1926 there was but one lead failure for every 104,551 motor-miles operated and 55 per cent of these failures occurred during January, February and March, when there was a large amount of snow and rain.

With inside-hung motors the company found it impossible to keep leads from chafing on brake levers

**Submitted in* Electric Railway Journal *Prize Contest.*

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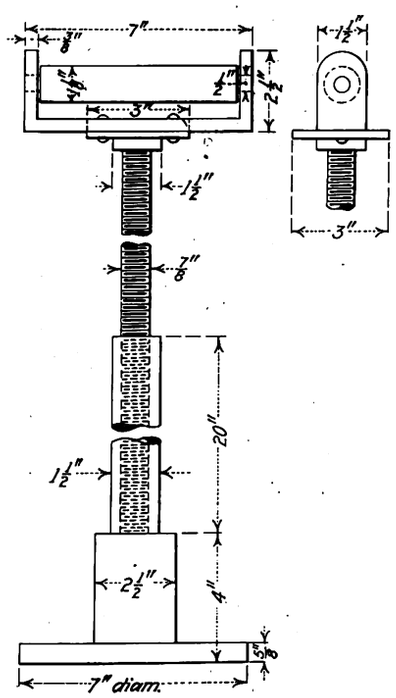
and motor cases where the leads were brought out on the suspension side. On the axle side the leads hang clear and do not come in contact with the brake rigging or motor cases. The small clearance between the car floor and motors on standard Birney type safety cars makes it necessary for the leads to lay on top of the motor where they are brought out on the suspension side.

Portable Stand for Drill Press

MACHINE work in the wood mill and machine shop can be done more readily if suitable equipment is provided to support the material undergoing the process. In the shop of the Manhattan & Queens Traction Corporation, Long Island City, N. Y., a portable adjustable stand for use in the machine shop and mill was constructed. This stand is shown in the accompanying illustration. The base is a forging with a flange and a hub of 2½-in. diameter to which a piece of



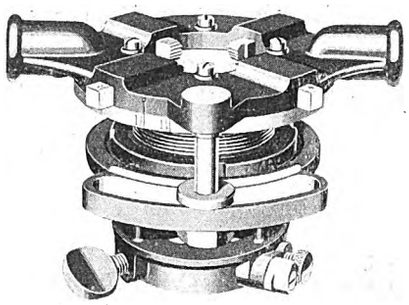
Adjustable stand for holding long material while being machined

steel of 1½-in. diameter and 20 in. long is welded. It is drilled and tapped for a screw 20 in. long fitted with a flange, to which is riveted a bracket 7 in. long. A roller made of tubing $\frac{1}{32}$ in. inside diameter and 1⅛ in. outside diameter is mounted on a ½-in. shaft and installed in the bracket. Turning the adjusting screw to the right or left in the upright raises or lowers the roller to any height desired for supporting the work.

New Equipment Available

Self-Contained Die Stocks

TWO new self-contained adjustable die stocks are announced by the Borden Company, Warren, Ohio. The No. 11 Beaver supersedes the



Adjustable die stocks

old No. 25 plain tool and the No. 11A Beaver supersedes the old No. 26 ratchet.

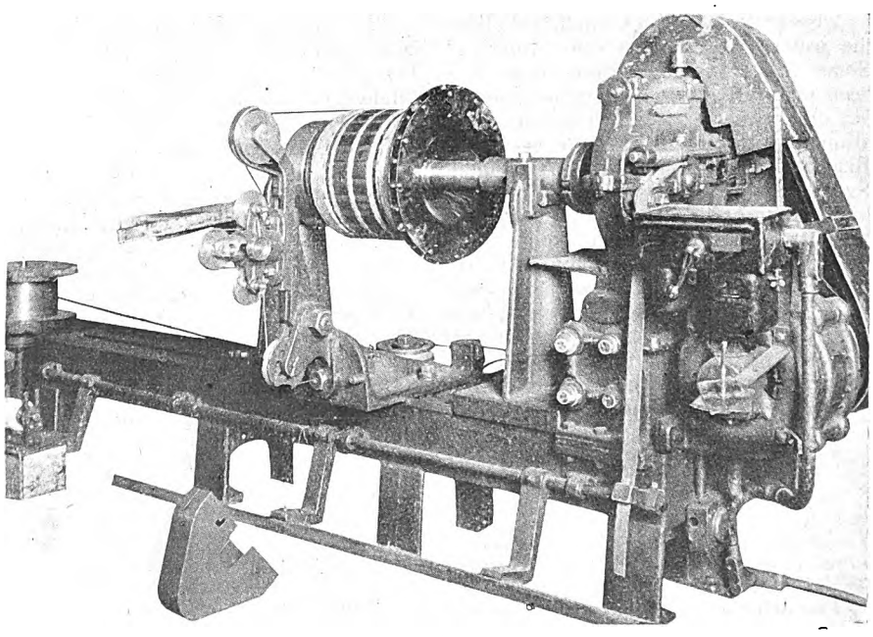
With the new tools one set of dies is set quickly to thread 1-in., 1¼-in., 1½-in. or 2-in. Mislaying of the dies is impossible. Adjustments are made to thread under or over standard without affecting the length of the thread. The threading dies in the new tool are made of high-grade alloy steel, specially treated, hardened and tempered to give long life.

In the new tools the die heads and threaded barrel are two separate parts so that when repairs are required but one part need be replaced. The work holder, or pipe-gripping device, is of new design and centers the pipe more accurately than previous types. Two knurled screws are set quickly and hold the pipe firmly, leaving only the thumb screw to be tightened after the die stock is placed on the pipe. Loose bushings are eliminated.

Banding-Wire Tension Indicator

EXACT tension in pounds on steel banding wire as it is wound on railway armatures by the banding machine or lathe is indicated by a device developed by the General Electric Company, Schenectady, N. Y. It provides a simple means of keeping track of this tension throughout the entire progress of banding the armature. The wire will not be stressed beyond the elastic limit or tensile strength of the steel, and will be kept under uniform tension during the winding.

An essential characteristic of the indicator is that it can be attached to practically any type of armature-banding machine. It is equipped with a rotary dial which can be turned to any position by loosening a nut and setting the pointer at zero, so that the scale may be read at any angle. The indicator dial is calibrated and graduated from zero to 500 lb., allowing the use of any size banding wire within the range of the machine. The center pulley wheel over which the wire runs is actuated by a heavy coil spring so that when the banding machine or lathe is started and stopped a constant tension is maintained.



Tension indicator with cover removed, attached to armature banding lathe

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Association Activities

Journal Becomes Correspondent of International Association

THROUGH appointment by the Union Internationale de Tramways, de Chemins de Fer d'Intérêt Local et de Transports Publics Automobiles, this paper has just become the official correspondent of that association in the United States. In consequence, it will publish notices of forthcoming meetings of the association. It will also be pleased to answer any inquiries from railway men in the United States in regard to the organization and its proceedings and of European electric railway practice in general, where it has the information.

The International Association completed on May 12 a six-day convention in Rome, Italy, at which subjects of very live interest to electric railway companies were discussed. Several of the reports presented at this meeting have been published in this issue and in that of May 26. Others, with a report of the convention, will appear in future issues.

One-Man Cars and Buses in Europe[1]

One-man operation is becoming more popular in Europe as the difficulties with fare collection are being overcome. Full automatic equipment is urged for both cars and buses. Details are given of Paris practice

By Louis Bacqueyrisse

General Manager of Transportation, Société des Transports en Commun de la Région Parisienne (Paris Surface Railway and Bus Lines), Paris

STUDIES of ways to reduce electric railway operating expenses come down in practice, always, to questions of equipment. This is true even of those disbursements made primarily for labor. If we are seeking to reduce the expenses attributable to poor quality of employees, we turn to equipment for the scientific selection of applicants for employment. If we aim to reduce the percentage cost of platform labor in our operating expenses we must investigate types of car equipment which increase the output of our platform men in car-miles.

A great deal has been published about the use of one-man cars in America.[2] Some progress along these lines has been made in Europe, though the number of one-man cars at present in operation there now will hardly exceed 400. Briefly the situation is that in England, Switzerland and France a few trials have been made. In Holland and Sweden one-man cars are quite generally employed. In Germany, Austria and Denmark a few trials have been made, but in most cases they have been with old cars without any of the distinctive one-man safety features. Simply the rear door has been closed.

The experience in Holland is made the subject of another report to be presented at this convention, so that the writer will review only the conditions in the other countries mentioned.

In England a single one-man car was put in service by the London United Tramways in 1922. It was a single-deck single-truck car with capacity for 30 seated passengers. Entrance and exit were in front and the door and folding step were interlocked and operated by hand. An automatic ticket-issuing machine issued five different types of tickets, and there was a travel indicator in the car to show to passengers its position on the road.

The result of the trial was so satisfactory that in 1924 the London United Tramways purchased four double-truck single-deck one-man cars. They were fitted with air brakes and pneumatic door engines with front entrance and rear treadle exit and a standard "dead man's handle." Fares were collected in a Johnson fare box, and the operator was assisted in fare collection by an automatic change-making machine.

The fare was that standard in London of 1 penny for one zone and 2 pence for two zones. The schedule speed was 10 m.p.h., with average stops of three seconds each. The operators received an increase of 10 per cent over the wages paid motormen on two-man cars.

The financial result with these cars is not available, but they did not prove popular with the London public, the reasons given being (1) absence of an upper deck which the English like because it gives them a place where they can smoke their pipes and (2) too complicated a system of fare collection on a line having many fare zones.

Another English installation was at Ashton, where a single-truck one-man car, provided with a smoking compartment, was put in service in December, 1923. Entrance and exit were at the front with manually operated doors. The headway was reduced from twenty minutes to fifteen minutes. A conductor is used on this car during 1½ hours morning and evening. No financial results have been published, but it is reported that the service has been expanded to six cars.

The city of Malmö, Sweden, began one-man service in 1921 with a number of old cars and very little change except to close the doors on the rear platform. In 1924 the service was expanded by the addition of cars equipped with separate entrance and exit on the front platform, the exit door being unlocked by the operator at each stop, opened by the passenger and closed by a spring. Fare boxes were used. Later, one city and three suburban lines were changed over to one-man operation. The most important of these lines, 4½ miles in length and with average distance between stops of 1,150 ft., carries 10,000 passengers daily. The headway was reduced and although the operators receive 10 per cent more wages than are paid to motormen on two-man cars, the saving in platform expense and materials has been very satisfactory.

As already explained, the only changes made on most lines in Germany and Austria, when one-man service was begun, were to close the rear platform doors, and post notices urging boarding passengers to have the exact change. It is not surprising, then, that these lines should show a reduced schedule speed owing to lengthened stops. On most of the systems, where one-man operation has been adopted, about fifteen altogether, this kind of service has been limited to lines of light traffic where the fare system was simple and where there was little passenger interchange. Generally, fares were collected in a fare box similar to the Cleveland or Johnson types.

Halberstadt has been using such a system for some time, with fare collection supplemented at heavy traffic points by street collectors.

Dresden has been running some cars on lines of light traffic, but later the service was extended to lines of heavy traffic. In 1922 there were 47 one-man cars, all single truck. During rush hours a conductor is sometimes used. The management believes that 40 passengers is the maximum which can probably be cared for on any of its one-man cars.

Brandenburg has installed several one-man lines, and to simplify the fare collection problem sells tokens at a reduction from the regular fare.

Berlin made a short trial, but when the traffic on the line increased, returned to two-man cars.

[1] *Abstract of paper presented at the biennial meeting of the Union Internationale de Tramways, de Chemins de fer d'Intérêt Local et de Transports Publics Automobiles, held in Rome, Italy, May 6-12, 1928.*

[2] *The extended survey of American one-man car practice by Mr. Bacqueyrisse occupies 72 pages in his report. It is not reproduced.*

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Augsburg, a city of 160,000 inhabitants, has been trying one-man cars on quite a general scale since 1923, though "floating" conductors are used in the congested sections during rush hours. The platform expense was reduced 35 per cent.

Odense, Denmark, runs all of its seventeen motor cars with one man, except that at times they pull trailers. The doors are manually controlled and a locked fare box is used. As the cost for labor, even under one-man operation, amounts to 54 per cent of the total expenses, it is obvious that one-man cars are a necessity. No accidents have been reported since 1911, except collisions with other vehicles on the street, which cannot be attributable to one-man car operation.

The systems in Arnhem and Amsterdam, Holland, are mentioned in another paper on this subject by Mr. Nieuwenhuis. All of the 63 cars in Arnhem are one-man, although there are several different types, varying in length from 27 ft. 10 in. to 33 ft. 6 in. over all. The doors are manually operated, but no special safety equipment is used except a dead-man control. The schedule speed is 12½ m.p.h., and a notable saving in platform expenses has been obtained, though the one-man operators are paid a bonus.

In 1924 the Swiss Federal Railway Department issued a list of minimum requirements as to safety for one-man cars, although the one-man system as in the other countries mentioned has as good a safety record as with two-man cars. These regulations relate principally to means by which passengers may stop the car and open the doors in emergency.

In Montreux, three cars have been in operation with satisfactory results, although on one line the grade is as high as 8.5 per cent.

One of the interurban lines out of Berne uses one-man cars 43 ft. 5 in. long. Basle had one car, but withdrew it because of increase of traffic on the line in question.

The Paris surface lines have done considerable in the way of one-man operation, as explained in a recent paper by Mr. de Ribes.[3] The latest one-man car has a capacity of 30 seated and 20 standing passengers. The two front doors are operated pneumatically, the entrance by the motorman and the exit on the rear platform by the Chicago treadle device. The two rear doors are kept closed except when a conductor is used. Folding steps interlock with the doors.

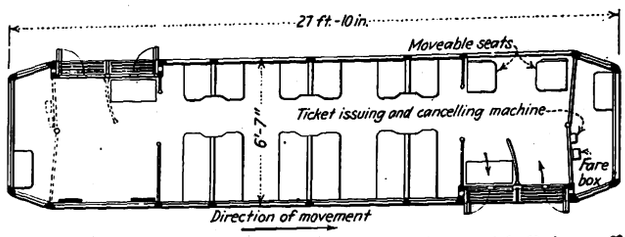
Since the development by the company of a special ticket-issuing and cancelling machine, mentioned in another report to the convention, the time taken to collect zone fares by one man presents no further problem.

One-Man Bus Operation

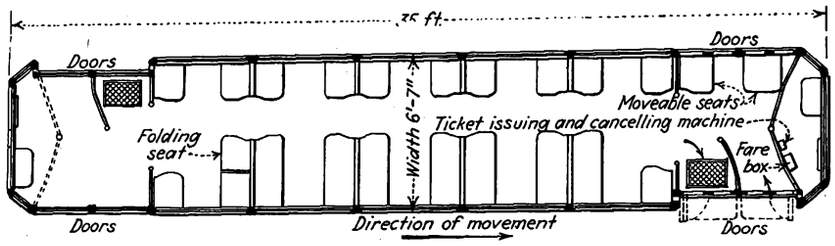
One-man operation for buses is fortunately farther developed in Europe than one-man operation for tramways, though the absence of statistics prevents an exact statement. The use of one man has not been extended as yet to double-deck buses, which are the standard in London and Berlin.

In England a notable instance of one-man operation of buses is at Leeds. In Holland, Amsterdam has 92 one-man buses, each with accommodations for 21 seated passengers. The single entrance and exit door is 24 in. wide and is manually controlled. The schedule speed of these buses is 9.6 m.p.h., with an average distance between stops of 1,226 ft. and an average length of stop of 8 seconds. A flat fare is used. The average number of passengers per car-mile is 4.6. The Hague has 28 one-man buses. They are from 24-passenger to 32-passenger seating capacity. Loosduinen in Holland has 18 one-man 20-passenger buses.

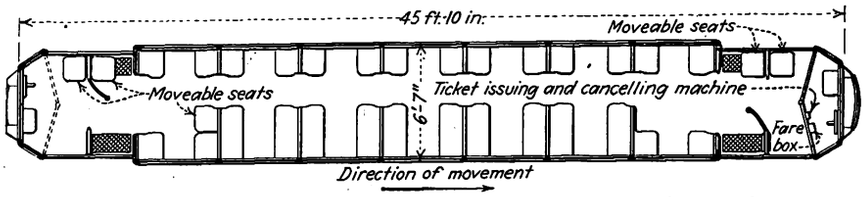
Vienna has 34 one-man buses. The fare collection problem is simplified in this city by the installation of automatic ticket-issuing machines at the most busy loading points and by street collectors at certain places during the rush hours. Under present economic conditions in Vienna, two-man service would be impracticable. The accident record is very low. Luxembourg has five one-man buses. They make a schedule speed of from 9½ to 11 m.p.h., with average distance between stops of 1,000 ft.



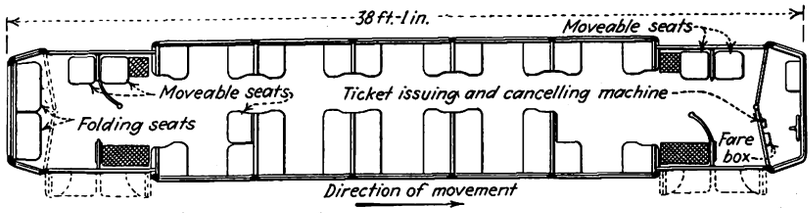
Recommended single-truck one-man car for lines with light traffic under European conditions



Recommended type of one-man car for large European systems



Recommended type of one-man car for European interurban service



Paris end-entrance double-truck trail car intended for one conductor but so designed that two may be used

The Paris Surface Railway & Bus Company (S.T.C.R.P.) is operating a number of suburban routes, with one man, to good satisfaction.[4] Bordeaux has ten one-man buses and 40 two-man buses and favors the former.

Conclusions on One-Man Car Operation

While much can be learned from America about one-man operation, it does not follow that American methods can be transferred bodily to Europe to advantage. The principal differences in conditions between America and Europe are: (1) excessive complication of European fares; (2) greater readiness of the American passenger to accept regulations intended for his safety.

Europeans have also to contend with limitations on the dimensions of the equipment which they must use, particularly the width of car body. The usual European width of 2 m. (6 ft., 7 in.), prevents the employment of cars with a capacity of 150 passengers each, common in America, and limits one-man car capacity for city service to about 50 passengers. For interurban service we can approach more nearly American standards.

[3] *See paper by Mr. de Ribes in* Electric Railway Journal *for April 28, 1928, page 704.*

[4] *For further information see paper by Mr. de Ribes in* Electric Railway Journal *for April 28, 1928, page 704.*

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With the limitations in dimensions and capacities mentioned, the writer feels he can recommend specific types of one-man cars for three different kinds of service, namely, light city traffic, large city systems and interurban routes. Diagrams are presented of the cars suggested, with one of a double-ended one-man trail car used by the Paris surface lines.

The first car shown, that for light and medium traffic, has accommodations for 20 seated and 20 standing passengers, and a wheelbase of 9 ft. 10 in. to allow it to go around a 50-ft. radius curve. The car is designed for Cardan drive with high-speed ventilated motors. The body is partly wood and partly light metal. There are separate entrance and exit doors at the front, pneumatically operated, and interlocked with the controller. The exit door is controlled by a treadle and the door on the rear platform is kept locked. When the direction of movement is reversed the fare box, ticket machine, barriers and two movable seats on the front platform are changed to the other end of the car.

The second type of car, designed for large city systems, has a capacity for 30 seated and 20 standing passengers, and a wheelbase of 12 ft. 6 in. The recommended type of motor suspension and nature of safety equipment are the same as for the small car. There are four doors on each side of the car but those on the rear platform are intended for use only when the car is being operated by two men or at important loading points where there is a street collector.

The third, or interurban car, has a capacity of 40 seated and 20 standing passengers and is mounted on double trucks. Each truck has two motors with Cardan drive. All-metal body construction can be used here, as there is less chance of damage to the vestibules from street collisions. The eight doors (four on each side) are arranged as in the large urban car, except that each of the exit doors is controlled by a treadle. This car has five movable seats. The two on each platform are transferred to the opposite side of the car when the direction is reversed and one seat is moved from one end of the car to the other to give more room at the front end.

On systems where at certain hours there has to be a very large increase in passenger accommodations, the answer can often be found in the use of trailers of a large capacity. The Paris system has two types, one a double-truck center-entrance 57-passenger car and the other the double-truck end-entrance, shown in the fourth illustration. This car has a capacity for 34 seated and 21 standing passengers, with four doors on each side, of which two are for exit and treadle operated, all pneumatically. The car is designed for one conductor on the front platform, but if desired, a second conductor can be stationed behind the railing on the rear platform with a second set of fare boxes and ticket issuing machines and with the end folding seats raised.

In general, a capacity of 20 passengers is sufficient for buses on small systems, especially where some light baggage has to be carried, and for express service in large cities; a desirable type of bus for systems of average size is for 30 passengers, and that for large cities is 40 or even 50 passengers. Where streets are very congested and street area is at a premium, there is a field for the double-deck bus.

For interurban runs, the six-wheel 29-passenger bus has a field, and for interurban runs of more than 35 miles, the 20-passenger bus will probably fit into more places than any other.

In city service the work required of the driver will be much simplified if the doors are operated by air.

While the one-man bus may not make quite as rapid time as the two-man bus of the same capacity, what the passenger loses in speed he makes up in frequency of service. Powerful equipment should be used to obtain rapid acceleration and retardation. Speed is also a function of the number and length of stops, and the latter in turn are largely affected by the arrangement of platforms, steps and doors, and by the method of fare collection. This latter can be speeded up by the use of fare boxes, ticket-issuing and cancelling machines, and change-making machines. At certain periods of the day a conductor or street collector can be used to advantage.

While the flat fare is the simplest to collect, the automatic ticket-issuing machine greatly reduces the complication of the zone-fare collection and, of course, pay-enter, pay-leave can be used on two-section lines, if the fare is uniform for each section.

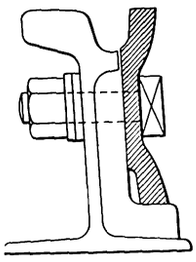
Finally, two essentials to the success of one-man service should not be overlooked. One is to secure the hearty co-operation of the employees by convincing them that their interest, like that of the company, is improved by economical operation and that no equipment will be omitted to simplify their work. The other essential is to secure the co-operation of the public. This can be done by instructing it, in advance of the actual introduction of the one-man car, of its advantages in the way of comfort, safety, increased service, and less need for higher fares. This can be done through the press, by moving pictures, and by notices posted in the cars.

Improvements in Rail and Ties*

Rail standardization is gaining more converts. Thermit is widely used for joints. Trials of ties being made

By Ed. Van Noorbeeck
General Supervisor,
Société Nationale des Chemins de Fer Vicinaux of Brussels, Belgium

IT WILL be recalled that the International Commission on the standardization of street railway rails has recommended four rails for straight track and four corresponding rails for curves, as shown in the accompanying table. A number of companies, especially in France and Switzerland, have accepted these standards.



Hard metal guard used on curves by some European street railways

For track over private right-of-way the almost general practice is to use a T rail, varying in weight from 36 to 72 lb. per yard. Some companies are using rails weighing from 90 to 100 lb. per yard.

Rail lengths are rarely less than 29½ ft. and for grooved rail are usually 39½ ft. or 59½ ft. One company (that in Brussels) has used rails as long as 65½ ft. but such rails are awkward to handle in city streets. Comparatively few companies are using transition curves, though such use is advisable where car speeds are considerable. Opinion is divided as to the desirability of inclining the rail and also between coned and horizontal tread wheels. Rail inclination is usually secured through an inclined base plate. Some companies use shallow grooves on the outside rails of curves so that the wheels will run on their flanges. Many companies use hard composition rails (manganese, nickel chrome, etc.) on curves. Some use on curves a rail without a lip but bolted to it is a guard rail of wear-resisting steel, as shown in the accompanying section. Only a few companies use a resilient material, wood, cloth or felt, under the base of the rail. However, such a plan undoubtedly reduces rail vibration and is especially desirable with a concrete substructure.

Rail joints are made with angle plates, thermit or arc welding.

Thermit is used in three different ways. Under one method used in new track and known as the pressure process, the rail heads are ground square and butted together with a small space ground out between the webs and bases. After the thermit has been cast around the joint, the heads are pressed against each other by powerful clamps. The joint is then machined. Where the rail is not free, this process has to be changed slightly.

**Abstract of paper presented at the biennial meeting of the Union Internationale de Tramways, de Chemins de fer d'Intèret Local et de Transports Publics Automobiles, held in Rome, Italy, May 6-12, 1928.*

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TABLE OF GROOVED RAILS RECOMMENDED AS STANDARD BY THE INTERNATIONAL COMMISSION

Straight rail	Weight Kg. per Meter	Weight Lb. per Yard	Height Mm.	Height Inches	Base Mm.	Base Inches
1	59.430	118.86	180	7.1	180	7.1
2	53.020	106.04	180	7.1	160	6.3
3	46.920	93.84	175	6.9	155	6.1
4	47.235	94.47	160	6.3	160	6.3
Curved rail						
1	61.560	123.12	180	7.1	180	7.1
2	52.150	104.30	180	7.1	160	6.3
3	50.750	101.50	175	6.9	155	6.1
4	51.220	102.44	160	6.3	160	6.3

The joint is opened by an expansion press and after the thermit is poured, the press is removed and the released elasticity of the rails supplies the pressure instead of clamps. In the third process, which is used principally with old track, a space of from $\frac{5}{8}$ to $\frac{13}{32}$ in. is sawed between the rail ends. After a mould has been set about the joint, it is preheated and the thermit is poured, some metal remaining over the rail head. After the joint has cooled it is machined. This third method is used principally for rail in place, where the other methods cannot be adopted. (See Editor's note.)

Better results than formerly are being secured with electrically welded joints and their use is increasing. This is partly because the technique of welding is understood better and partly from improvements in design. These latter lie principally in the addition of a base plate welded to the rail bases, just as the angle plates are welded to the sides of the rail. In fact, one company (Société Nationale des Chemins de Fer Vicinaux of Belgium) has laid 5,000 joints with welded base plates but no angle plates. Where this has been done, the rail ends are prepared for welding by having their edges beveled off with the electric arc all the way around except at the base. After the base plate is welded in place, the notch formed between the beveled edges is filled up with metal by the arc. Then the rail heads are ground smooth. Marseilles has also used this method of notching or chamfering the ends of two abutting rails and filling up the space with metal deposited by an arc. In that city, while the notch in the heads of the rails is being filled with metal the rails are kept aligned by temporary angle plates. After the work on the head is finished, these plates are removed and the sides of the rail are treated in the same way.

Of the 76 companies replying to the questionnaire, 60 used some kind of joint welding. Of these, 26 employed thermit only, the other 34 using both thermit and arc welding. Of this latter number, eleven used arc welding only for auxiliary track work or at compromise joints. The other thirteen used thermit for new track and arc welding for old track. A recent article in a French engineering paper points out that the effect of the heat necessary in welding joints tends to soften the steel by reducing the carbon and manganese contents. It suggests, if possible, some method of welding by which air would be excluded from the rail surfaces. No practicable plan has been developed to accomplish this result, but it is worth the attention of welding experts.

As for ties, of the 76 companies replying to the questionnaire, 63 used ties of some kind. Of this number 40 used wooden ties only, four metal ties only, and the remainder ties of more than one kind. Of the latter number, six have reinforced-concrete ties in experimental use. Where wood ties are employed, oak is most generally used, then pine, then beechwood. The ties are usually treated with creosote, sulphate of copper or carbolineum.

The four companies using metal ties exclusively are Constantinople in Turkey, Hamburg and Mannheim in Germany, and one road in the Belgian Congo. Paris is one of the roads testing metal ties.

Where reinforced-concrete ties are being employed, steel plates or wooden blocks are set in the concrete so that the rail may be held to it by screw spikes or clips. Concrete ties may be considered to be still in the experimental stage. They are expensive and awkward to handle but have manifest advantages in moist soil.

Editor's Note: All the thermit methods differ from that generally used in this country. The pressure method is very difficult here because American rails are much higher in carbon than the European rails. As the carbon content increases, the difficulty of pressure welding increases very rapidly. Also, it is usually thought necessary in America to weld from twenty to thirty joints per day with one equipment. Since the European method requires a loose rail ahead all the time, the amount of track which can be laid in a day is limited and the production is cut to perhaps six to eight joints per day. The clamps used in European welding weigh about 800 lb. On the higher carbon American rails, a much more powerful clamp would be required to get satisfactory results. It has even been considered necessary to use hydraulic clamps for this type of welding wherever American rails are used. The use of clamps of this type would, of course, increase the cost of the welding in America to a point where it would be almost prohibitive. With the "insert" method as used in America, clamps of this type are not necessary. In fact on wood tie track, no clamps at all are required, and on steel tie track, light clamps are used only to hold the rail in line while the welding is being done, provided the welding is done ahead of the laying of concrete. If the welding is done after the concreting, no clamps are required on this type of track.

The second type of welding described in Mr. Van Noorbeeck's article, that by pressing the rails apart, is not practiced in America. The "insert" method obviates its necessity. The third method described also differs from that used here, as in this country a shim of rail steel is inserted between the rail ends before the rail is cast. This prevents any danger of cupping.

Incidentally the Metal & Thermit Corporation of New York, from which the data in this note were obtained, is closely allied with the Thermit companies of Europe. The closest co-operation is maintained among the four companies and each avails itself of the methods and processes of the others, as well as of their engineering advice and experimental work. The different processes developed show how methods have to be changed because of dissimilar conditions.

COMING MEETINGS OF *Electric Railway and Allied Associations*

***June 4-6*—Midwest Electric Railway Association, Hotel Baltimore, Kansas City, Mo.**

***June 4-8*—National Electric Light Association, Atlantic City, N. J.**

***June 6-8*—Canadian Electric Railway Association, annual convention and exhibit, Toronto, Canada.**

***June 12-13*—American Wood Preservers' Association, Chattanooga, Tenn.**

***June 14-15*—New York Electric Railway Association, Half Moon Hotel, Coney Island, N. Y.**

***June 20-27*— American Railway Association, Div. 5—Mechanical, annual convention and exhibit, Atlantic City, N. J.**

***June 21-22*— American Railway Association, Motor Transport Division, Atlantic City, N. J.**

***June 21-22*— Wisconsin Utilities Association, Accounting Section, Hotel Pfister, Milwaukee, Wis.**

***June 28-29*—Central Electric Railway Association, Cedar Point, Ohio.**

***July 8-12*—Public Utilities Advertising Association and International Advertising Exposition, Detroit, Mich.**

***July 13*—A.E.R.A. Executive Committee on yacht "Florida," New York, N. Y.**

***July 18-20*—American Society of Civil Engineers, annual convention, Buffalo, N. Y.**

***July 19-21*—Pacific Claim Agents' Association, annual convention, San Diego, Cal.**

***July 25-27*—Electric Railway Association of Equipment Men, Southern Properties, Cincinnati, Ohio.**

***July 27-28*—Central Electric Railway Accountants' Association, Detroit, Mich.**

***Aug. 16-17*— Wisconsin Utilities Association, Transportation Section, Sheboygan, Wis.**

SEPT. 22-28, 1928

American Electric Railway Association, 47th annual convention and exhibit, Cleveland, Ohio.

Wood Preservation Meeting

COMMITTEES of the American Wood Preservers' Association and the American Railway Engineering Association on Wood Preservation will hold a summer meeting in Chattanooga, Tenn., June 12-13. All those attending will have the opportunity of visiting the treating plant of the Western Union Telegraph Company, where zinc metarsenite is being used, and the car shops where lumber treated with this preservative is being utilized.

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News of the Industry

By Air and Interurban in Ohio

The Cleveland & Southwestern Railway & Light Company established a regular schedule of rail and air service connections in conjunction with the Stout Air Service, Inc., which operates a daily passenger air line between Cleveland, Ohio, and Detroit, Mich. Ten northern Ohio cities—Medina, Elyria, Oberlin, Wooster, Ashland, Mansfield, Crestline, Galion, Bucyrus and Wellington—are affected by the plan, under which through rates and service have been put into effect over the interurban lines to the Cleveland airport and thence by plane to Detroit.

The plan was made operative on May 28 when tickets for the combined rail-plane service became available at all ticket stations of the Southwestern. No additional track construction was necessary, since the interurban line runs past the airport a short distance outside of Cleveland. E. L. Hukill, traffic manager of the Cleveland & Southwestern, made the arrangements with officials of the Cleveland-Detroit air line after he had flown to Detroit and back and had become an air enthusiast. Prospective users of the new service may arrange to board an interurban, which will make connections with the planes at the airport, by consulting ticket agents in their respective towns. Two round trip flights are made a day, one in the morning and one in the evening, so it will be possible for anyone on the Southwestern lines to make a trip to Detroit in the morning, have five hours there and return home the same day.

Three-motored Ford planes each accommodating fourteen passengers are in service on the Cleveland-Detroit air line. Every possible convenience is provided. The air trip takes from an hour to an hour and a half, compared with more than four hours by rail. The Ford planes also make daily sightseeing trips of 50 miles over Cleveland. The arrangement with the Southwestern also provides for excursion rates to the airport including the sightseeing ride.

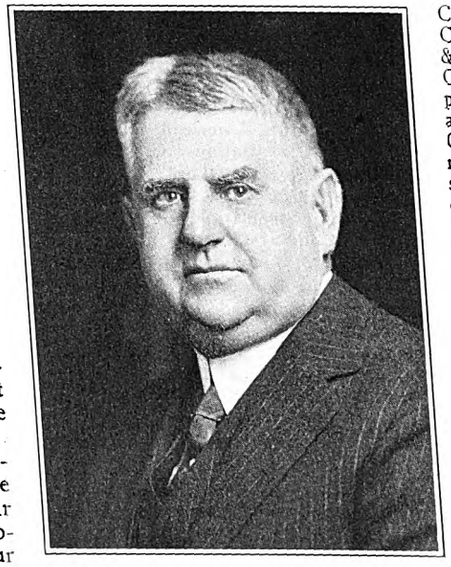
Threat of Competition in Baltimore

Linwood L. Clark, an attorney who represented one of the bodies opposed to the increased fares for the United Railways & Electric Company, Baltimore, Md., has written the Maryland Public Service Commission that an undisclosed principal is prepared to make the necessary application for the right to operate a bus system in Baltimore in competition with the United. Mr. Clark said the present purpose is to ascertain if the franchise rights of the United "are of such pre-emptive character as to exclude a competitive city-wide bus system furnishing superior service at less cost to the public, park tax or its equivalent included."

In reply the commission, through Chairman Harold E. West, has declined to give an expression of its stand on a city-wide and suburban passenger bus service until it receives the application in regular form. Mr. West said that the commission can only pass on specific applications regularly before it for adjudication and then only in the light of the particular facts and circumstances presented. On the facts submitted, he said, the commission would hesitate to give a categorical answer and that it would not attempt to express an opinion about the legal or other rights of the United Company in the premises.

President Thomas N. McCarter Honored

More than 600 invited to dinner to him culminating the celebration of 25th anniversary of company's founding. Optimistic over prospects of transportation unit's co-ordinated service



Thomas N. McCarter

CELEBRATION of the 25th anniversary of the formation of the Public Service Corporation of New Jersey with Thomas N. McCarter at its head as president culminated in a dinner on the evening of June 1 to Mr. McCarter at the Robert Treat Hotel. About 600 guests attended, including industrial leaders of New Jersey, state and municipal officials, prominent utility men from the Eastern part of the United States and officers of the corporation. The roster of names at the speakers' table included:

Thomas S. Gates, Col. A. R. Kuser, Samuel T. Bodine, directors of the Public Service Corporation; Percy S. Young, director and vice-president of the Public Service Corporation; E. I. Edwards, U. S. Senator from New Jersey; John B. Miller, California Edison Company; Arthur W. Thompson, president of the United Gas Improvement Company; A. Harry Moore, Governor of New Jersey; Thomas N. McCarter; Owen D. Young, General Electric Company; Edward T. Stotesbury, Drexel & Company, Philadelphia; Uzal H. McCarter, director of the Public Service Corporation; Edmund W. Wakelee, director and vice-president of the Public Service Corporation; Joseph F. Autenrieth, chairman New Jersey Public Utilities Commission; Gen. W. C. Heppenheimer, director of the Public Service Corporation; John L. Waterbury, former director of the corporation; Frank Bergen, general counsel of the corporation.

Credit is frankly given by his associates to Mr. McCarter for the work he has done in welding together the present state-wide system of electric railway, electric light and power and gas systems and directing them to their present magnificent standards, and in turn credit is just as frankly given by Mr. McCarter to the men and women in the companies of which he is the head for the part they have played in the 25-year program of progress, to which reference will be made more in detail later. Here the concern is first with the beginnings; then with the accomplishments.

Prior to the organization of the company, Mr. McCarter had attained distinction not only as a leading member of the bar, but as State Senator and Attorney General of New Jersey. He was familiar with the public utility situation existing at that time. Service was being rendered by scattered and comparatively small units. Additional money was needed for improvements and extensions. The time had come when a thorough reorganization and rehabilitation of the gas, electric and railway properties were necessary. Then the opportunity and the man met. It was Mr. McCarter who conceived the plan for bringing under one management the then scattered properties and, in collaboration with Randal Morgan and John I. Waterbury as a committee, he proceeded to develop the details of the plan which was finally put into

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effect. One of the stipulations made by the men interested in the project was that Mr. McCarter accept the presidency of the new company. This he finally consented to do although it made it necessary for him to give up further practice of his chosen profession. As Edmund W. Wakelee, vice-president of the company, has expressed it, during these twenty-five years there have been many problems to be solved, many adverse conditions to be overcome, but through good times and bad times, in prosperity and in adversity, President McCarter has supplied the energy, courage and directing force necessary to carry out his plans and make his vision a reality. And all this time Mr. McCarter has played a most important part in shaping the national destiny of the industries included in the New Jersey corporation's activities, particularly in the electric railway industry, in the councils of which he has been a factor since first he entered the utility field.

Mr. McCarter's message to his associates follows:

In this, the 25th anniversary of Public Service, I extend my personal and official greetings to each member of the Public Service staff.

During its existence of a quarter century, Public Service has constantly expanded electric, gas and transit facilities an is today justifiably proud of the three great utility systems which are so adequately serving the people of New Jersey.

It is no less proud of the splendid organization of men and women which operates, maintains, expands as increased demand requires, and gives life to these physical properties. To the intelligent, faithful and efficient efforts of this Public Service family, the success of the enterprise and the complete and dependable service that it provides are in large measure due.

I am profoundly grateful for the loyal support that the organization has given me as its chief and it is with feelings of personal gratitude that I extend to its every member the thanks of the officers of Public Service and express their appreciation of services rendered. Please accept my best wishes for your health and prosperity.

Celebration a Company Event

While the dinner to Mr. McCarter overshadowed other events in connection with the celebration of the twenty-fifth anniversary, still it was just one of a number of events in connection with the present occasion. On May 22, in the directors' room in the Newark Terminal, an oil portrait of Mr. McCarter was unveiled. The portrait was done by John Christen Johansen of New York, who was commissioned to do the work following an announcement of the proposed presentation, Oct. 20 last, at a dinner to Mr. McCarter, by the Public Service organization on the anniversary of his sixtieth birthday.

Since the organization of the company, 1903, more than $163,000,000 has gone into additions to and extension of electric facilities.

Since 1903, more than $59,000,000 has gone into additions to and extension of gas facilities.

Since 1903, some $71,000,000 has gone into additions to and extension of transportation facilities. Public Service Corporation has not hesitated to add to an already extensive and complete railway system, a complementary motor bus service which is already one of the most extensive in existence. The 378 miles of railway track which Public Service took over in 1903 have been increased to 878 miles, while there have been added to the equipment available to serve the public 1,800 street cars and 1,400 motor buses.

Mr. McCarter said recently:

Confidence in the state's future development, growth and progress led in the first place to the organization of Public Service and is still a guiding principle of those who have its affairs in their charge. We are planning and building now so that Public Service will be in a position to meet all demands for service as they will be made in the coming years. Within the last twelve months we have entered into an agreement with neighboring electric companies for the formation of the world's largest power pool which assures to New Jersey an ample supply of electric power, capable of expansion to meet future requirements.

As Mr. McCarter sees it, there is no problem more vital as affecting the interests of New Jersey than that of adequate and convenient local transportation and the solution of no similar problem is fraught with more difficulties. But his remarks left no doubt about the character of the accomplishments of the company in this particular sphere of its activities. There appeared to be no mistaking the fact that Mr. McCarter feels that a solution of the problem is possible and best of all that it is near.

"No Parking" Decreases Number of Accidents in Chicago

A study of accident reports recently completed by traffic engineers of the Chicago Surface Lines indicates that since Jan. 10, when the no-parking ordinance became effective in the downtown district of Chicago, Ill., there has been a decrease in accidents involving street cars of approximately 30 per cent. This decrease is credited to the greater facility with which cars now enter the Loop district and to the reduction in the number of collisions between automobiles and street cars which were due to the maneuvering of automobiles into and out of parking spaces.

An ordinance recently passed by the City Council which would have prohibited all mid-block or "U" turns on downtown streets, was vetoed recently by Mayor William Hale Thompson. The Mayor explained his action by saying that he had received many protests against the measure and that he had been informed that the ordinance was illegal. It is understood that the ordinance will be referred back to the traffic committee of the City Council and submitted to the corporation counsel for an opinion with regard to its legality.

Decision Reserved on Philadelphia 5-Cent Fare Suit

A special Federal Court of Equity, composed of Circuit Court Judge Davis and District Judges Dickinson and Kirkpatrick, reserved decision on a motion by two taxpayers to restrain the Philadelphia Rapid Transit Company, Philadelphia, Pa., from collecting more than a five-cent fare pending a final decision by that court in the case. The suit is for recovery of $79,800,000 in excess fares over the five-cent base fixed in the 1907 Philadelphia Rapid Transit-city agreement. Complainants contend that the Public Service Commission and fare rulings of that body are unconstitutional.

A somewhat similar suit was dismissed by Federal Judge Dickinson in June, 1926.

Covington Company Seeks Fare Increase

A proposal to increase fares in the Northern Kentucky communities from 5 cents to 10 cents cash, with an 8½-cent ticket rate, was made by H. C. Blackwell, president of the Cincinnati, Covington & Newport Railway, at a joint meeting of Kentucky city officials on May 23. The franchises under which the company now operates are perpetual. Most of them stipulate a 5-cent fare.

Mr. Blackwell pointed out that the sale of merchandise of any kind at cost or below cost would result only in disaster to the business to the discomfort of all who depend on it. Among other things he said:

The citizens of Cincinnati, confronted with practically the same conditions as exist in the Kentucky communities, met and solved the problem in the course of a reasonable time. Not only are the city streets there something to be proud of, but so is the railway. Street railway equipment, both rolling stock and tracks, under a proper rate of fare, can be kept in the condition they should be; and when additional or better service is needed, it can be supplied.

Everyone knows that it is impossible to operate under a 5-cent fare and as support for this statement all we need do is to accept the word of the Cincinnati city officials who have found that the service-at-cost plan requires a 10-cent cash fare for single-trip passengers, or three tickets for 25 cents. Every expense encountered by the Cincinnati Street Railway has its parallel for the Kentucky company, and we have an additional expense in the toll charged for crossing the Ohio River.

Mr. Blackwell said he knew of few other communities where a 5-cent fare is in existence. He was not asking the city officials, upon their return to their various cities, to authorize an increase in fare, but to give the matter most serious consideration, together with the promise from him that with the adoption in the Kentucky communities of the fare now being charged in Cincinnati would come increased service, where necessary, and reduced rates for current in Kentucky, thereby benefiting the entire community.

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New Franchise Ordinance in Toledo

Provides for bus monopoly by Community Traction Company. Power rate reduced and fares to remain as at present. $560,000 rehabilitation program

A NEW ordinance in the form of a contract with the Community Traction Company, its ownership as represented by the Toledo Traction, Light & Power Company, and the city of Toledo, Ohio, supplementary to the present Milner franchise, has been introduced into the City Council by Mayor William T. Jackson and is now being studied. Along with the ordinance the Mayor filed a letter explaining the provisions of the plan worked out largely by Commissioner E. L. Graumlich and David H. Goodwillie, member of the street railway board of control, in conference with representatives of Henry L. Doherty & Company, and whipped into legal form by city and company attorneys. He also transmitted an agreement between the Toledo Edison Company and the Community Traction Company relative to a reduction in the power rate, an agreement on the part of the company to keep step with the city on its paving program for a period of five years, and a program of extensions and betterments to service, including fourteen new bus routes requiring 104 new buses.

In the new ordinance the railway is granted a virtual monopoly of bus operation, since any independent line is prohibited within a quarter mile of a company railway or bus route. Under this provision it will be the policy of the railway to purchase equipment of existing lines at a fair appraisal as determined by a board named by Mayor Jackson. The bus operators have no franchise rights in the streets and have not been subject to city regulation. In the banning of motor coach operations within limits the new ordinance specifically exempts taxicabs, which have recently put into effect a 50-cent flat rate within city boulevard limits.

Among the important features of the new plan to supplement the Milner ordinance are the following:

The power rate will be reduced to a basis that will save the company $150,000 in the next five years. It will be readjusted periodically to conform to costs of coal. The Toledo Edison Company will also rebate $150,000 in 60 monthly installments of $2,500 each on account of power charges in recent years.

The Community Traction Company will pay the city an old paving claim amounting to $270,000 in which interest is included. It will also pay the city $10,000 expended in transit surveys, pay a claim for an attorney who represented the board of control in power litigation, and some other minor claims.

A five-year rehabilitation program is set up and it will require expenditure of about $560,000 to be furnished by the Toledo Traction, Light & Power Company, now owning the major portion of the company securities. Of this money $185,000 will be available the first year, $181,000 the second year, $57,000 the third year, $119,000 the fourth year and $18,000 the fifth year. During the five-year period covered by the ordinance the company will make replacements amounting to $230,000 with $120,000 available the first year, $60,000 the second year and $50,000 the third year. This will afford the company a chance to replace worn-out equipment in the next three years.

A loan fund of $30,000 is authorized to make a down payment on bus purchases. Probably more than 100 new coaches will be purchased if the plan becomes operative.

The Community Traction Company now is obligated to its owners for about $900,000, which is substantially the amount of the deficit in the stabilizing fund less the original $400,000 in that fund at the time the Milner ordinance went into effect. Interest and payment of principal on this loan are to be suspended for a period of ten years unless the agreement with the city of Toledo is terminated earlier. By reason of this fact the rate of fare would be subject to reduction in case the stabilizing fund reaches $500,000.

Railway fares will remain as at present. This will mean that all bus fares will be reduced slightly. The fare scale now is 10 cents cash, three tickets for 25 cents, and 1 cent for transfer. Buses operated by the company have been bringing a straight 10-cent fare with 3 cents for transfers.

The company will put in three new crosstown lines, conforming to general recommendations of the Milner ordinance, and eleven other routes substantially extensions to lines as contemplated under a general revision of the system provided for in the franchise.

Adoption of the ordinance agreement will also restore to the City Council control of service by suspending the deficit in the stabilizing fund.

In his letter to the City Council Mayor Jackson explained the present plan, indorsed it and recommended that it be studied carefully by individual members of the Council. He said:

> It is my opinion that the proposed agreement is in every respect fair to the city. It makes possible better service by the co-ordination of the railway and bus lines. In other words, it contemplates a complete transit system for the entire city at a rate of fare governed by the service-at-cost features of the present franchise. The agreement would not bind the city for a period longer than five years, and if at the expiration of that period further concessions by the company are needed the city will be free to negotiate with the company. If at that time negotiations are of no avail the City Council can make arrangements for other bus service.

The ordinance is nullified if either party fails to live up to the agreement. If the city fails to prohibit independent buses the financing concessions would be sacrificed, and if the company did not perform its covenants the city could bring in competing bus lines.

Chicago to Vote on Three Transportation Problems

As a result of the filing last April with the Cook County Election Commissioners of petitions asking for a referendum vote on certain questions concerning the local transportation problem in Chicago, Ill., three major proposals will appear on a ballot at the judicial election to be held in Chicago and throughout Cook County on June 4. The petitions, which carried a total of more than 300,000 signatures, were filed by a group of local civic and improvement organizations and others interested. The questions are:

1. Shall all legislation enacted by the Legislature and all ordinances passed by the city of Chicago pertaining to Chicago local transportation or subways be first submitted to a referendum of the voters of Chicago before becoming effective?
2. Shall the City Council of Chicago refuse to pass any ordinances which have for their purpose the use of the traction fund to build downtown subways?
3. Shall the city of Chicago proceed without delay to provide transportation where the present facilities are inadequate or lacking, particularly in the outlying districts, by the use of pneumatic-tired buses, the necessary expense to be paid out of the traction fund?

Surface-Car Subway in Philadelphia Approved

The Locust Street ordinance, passed by the City Council of Philadelphia, Pa., was signed by Mayor Mackey on May 16. This appropriates $10,000,000 of loan funds toward the construction of the Locust Street surface car subway. The $10,000,000 fund authorized will be drawn upon by the Philadelphia Rapid Transit Company for the initial construction of the $40,000,000 subway. Under the city-company agreement, passed by the Council and signed recently by the Mayor, the transit company is empowered to enter into contracts for the building of the line. The Philadelphia Rapid Transit Company has agreed to meet the fixed charges on the money borrowed by the city for the work, and when the project is paid for, title will remain vested in the city.

The ordinance declaring the city's intention of acquiring the holdings of the underlying systems of the Philadelphia Rapid Transit was also approved by the Council. This legislation will enable the city Administration to petition the Public Service Commission for a valuation of the underliers' franchises. It has been estimated that the holdings can be purchased for $136,000,000 and it is believed the city can save $4,500,000 a year for itself by substituting itself as lessor of the underliers' franchises and collecting the rentals now paid those systems by the Philadelphia Rapid Transit Company.

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California Commuters to Pay Higher Fare

Monthly ferry commutation rates on the Key System Transit and Southern Pacific Lines have been increased by the California Railroad Commission, but existing local railway rates and single-trip ferry fares remain at 7 cents and 21 cents respectively. Commuters from Oakland, Alameda, Berkeley and Piedmont will pay $6.50 for monthly tickets instead of $5.20, and those from other Bay points on the Oakland side $7 effective July 1. The companies had asked for 10-cent local fares and a 25-cent single ferry fare.

Commissioner Clyde L. Seavey wrote the opinion for the commission, which was supported by Commissioners Thomas S. Loutitt and Leon O. Whitsell. Dissenting opinions were filed by Commissioners W. J. Carr and Ezra DeCoto, both of whom, however, voted for the rate increase.

Messrs. Carr and DeCoto held that it is unfair to throw the burden of supporting an unprofitable street railway upon the shoulders of the commuters. They expressed the belief that increased rates would not solve the difficulty when traffic fell off as rates went up. Mr. Seavey charged that the Key System had not co-operated with the commission in trying out the experimental 5-cent fare zone plan ordered last November on recommendation of A. O. Mott, the commission's chief engineer. The company obtained a rehearing on the ground that 5-cent fares would bring bankruptcy. The commission sustained the contention of the companies that they are not getting a fair return on their investment, that the Southern Pacific operates its ferry and suburban service at a loss and that the Key System makes a small profit. Further, that buses and private autos are cutting into the business.

Mr. DeCoto's opinion is that the Key System would have been better off if the traction fare had been kept at 6 cents and not raised to 7 cents. He sees rigid economy as the only hope and recommends that competitive operation of parallel lines be eliminated by the companies.

Improvements on Illinois Traction Approved in St. Louis

The attitude of the St. Louis, Mo., city administration toward the $5,000,000 terminal improvements for the Illinois Traction System was indicated May 22 when the Board of Public Service unanimously approved a proposed ordinance vacating certain streets to permit the construction of the contemplated new freight and express office building at Twelfth Street and Lucas Avenue. The company has applied to the Board of Aldermen for a new 50-year franchise permitting the construction of the new terminal, subway and elevated lines.

Advantages to be gained by St. Louis through the project as outlined by D. W. Snyder, executive vice-president of the company, are: The building up of the entire northeastern section of St. Louis with an increase in property values and tax returns; a 50 per cent increase in passenger service over the Illinois Traction System into St. Louis and the bringing to St. Louis of shoppers who now patronize smaller towns in Illinois; a reduction in running time of from 30 minutes to one hour; halving commuter service between St. Louis and nearby Illinois towns and a $250,000 increase in freight traffic.

Silver street car awarded to Lincoln Division employees of the Chicago Surface Lines for their meritorious work in accident prevention. The trophy is on display at the Women's World Fair, now in progress in Chicago

One Carfare in St. Louis

Universal service throughout the entire city zone area for the price of a single carfare is now offered in St. Louis, Mo., by the St. Louis Public Service Company. This policy became effective with the granting by the Board of Public Service of a permit to the company to extend its South Grand Avenue line by means of buses. Patrons can now ride between any point within the city zone area and Carondelet Park and from Carondelet Park to any point reached by the system for one carfare. Application has been made for assignment to the St. Louis Public Service Company of the permits to operate buses on the streets of St. Louis now held by the St. Louis Bus Company, which has been affiliated with the railway. The differential of 2 cents and 3 cents charged for transfers between cars and buses will be wiped out.

Believe Higher Fare Needed by Capital Traction

Intimating that the Capital Traction Company, Washington, D. C., would seek an increased rate of fare soon after the adjournment of Congress, members of the Public Utilities Commission calculated recently that a 10-cent cash fare or six tokens for 50 cents probably would be necessary to give the company a fair return on its valuation of $26,750,000. The present rate of fare is 8 cents cash or six tokens for 40 cents. The company earned in 1927 only 3.8 per cent on this valuation.

Texas Property Goes Into Freight Business

The Texas Electric Railway, Dallas, Tex., handled its first carload of freight through its Italy connection with the Missouri Pacific on May 22. The car was turned over to the electric railway by the Texas Power & Light Company at Waco and moved via the electric railway line to Italy, thence by Missouri Pacific to Fort Worth, and by the Texas & Pacific to Odessa, its destination. The Texas Electric Railway staged a ceremony at Waco and there was a similar ceremony at Italy.

The company has gone into the freight business under an order issued by the Texas Railroad Commission. It is understood that later the electric railway will apply to the Interstate Commerce Commission for permission to handle interstate freight, thereby becoming, if its plea is allowed, an electrically operated railroad, with full freight interchange agreements with the steam railroads. Since the Missouri Pacific does not now enter Dallas direct, it now obtains an entrance of this kind via the electric railway. It is understood that the change means the provision of increased terminal facilities by the electric railway at Dallas and the purchase by it of electric locomotives for handling freight.

Eight-Cent Fare Sought in Rome

A petition for increased fares has been filed with the Georgia Public Service Commission by the Rome Street Railway, Rome, Ga., and set for hearing on June 12, 1928. The company is a subsidiary of the Georgia Power Com-

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pany. It seeks to establish an 8-cent fare in place of a 6-cent fare now in effect; to sell two tickets for 15 cents, and to establish a 4-cent fare for school children instead of the present 3-cent fare.

According to the petition, the present rate schedule does not permit the company to obtain a fair return on its property investment.

Safety Winners in Rochester Dine on Turkey

It pays to play safe in Rochester, N. Y.—at least for operators of the New York State Railways. Fifty employees of the Main Street car line, winners in the annual safety contest, were honor guests of the railways at a turkey dinner at Hotel Seneca. This line ran 7,396 miles throughout the year for every accident point scored against it. City Safety Commissioner Nier was the speaker at the banquet.

Besides the annual competition between employees of lines, a monthly contest among divisions is held with a banner and a dinner as the award. Right now the Portland Avenue division holds the flag. Back of all this Leon R. Brown, safety director, has a carefully prepared plan to cut down accidents.

Public Responsible for Transportation System

Victor Murdock, publisher of the Wichita, Kan., *Eagle,* who served many years in the House of Representatives and has been a world traveler and speaker, in a recent editorial declared that the public must share responsibility for good or bad transportation in Wichita. He was especially urging a better rate of fare. His ideas were:

> Lack of an adequate transportation system fare must necessarily curtail maintenance and extension. Without an adequate fare the entire growth of Wichita will be undermined. It is your responsibility to see that Wichita transportation lines are maintained and extended. It is your responsibility to see that the transportation company is granted a rate sufficient to maintain and surpass its present service. Without an increased rate, transportation will suffer—without transportation the growth of Wichita will suffer.

Charter for Rockford-Freeport Line

The Rockford-Freeport Railway has been organized to continue the interurban line from Rockford, Ill., to Freeport, 27 miles to the west. It is controlled by the Central Public Service Corporation, Chicago, an affiliated company with the Rockford Electric Company. This road was formerly a part of the Rockford & Interurban Railway system. It will be operated by the Rockford Electric Company in conjunction with the line running to Beloit, Wis. The interurban line running east from Rockford to Belvidere and Elgin is not a part of the Rockford Electric system.

Recent Bus Developments

Buses Run at 15 Cents in Kansas City

Following a vote of the City Council of Kansas City, Mo., on bus changes of the Kansas City Public Service Company, authorizing rerouting and a fare increase on trunk lines to 15 cents, buses started operating under this franchise for a trial period of six months, beginning June 1. The permit then will be ended or renewed, according to the findings. The new permit allows bus fares of 15 cents on all trunk lines in contrast to the former 10-cent fare. Five trunk lines and seven feeder lines are approved by the Council, in place of five trunk lines and six feeder lines.

The ordinance allowing revision of the bus system for a trial period was enacted after three hours of discussion and the introduction of seven amendments, two of which carried. The body approved the 15-cent fare on buses in the belief that the trunk lines were luxuries, paralleling the street car lines, and that tram patrons should not be penalized to support the buses.

Two amendments introduced by Mayor Beach, containing provision of the present bus franchise, but which were not incorporated in the new one, were approved unanimously. One provides that the railway must pay the city 1 cent on each gallon of gasoline purchased when the vendor does not pay the 1 cent city tax, the money to be used for upkeep of the streets on which buses operate. The other absolves the city from blame in bus accidents caused by the buses encountering defects in the streets.

The appeal of the company for relief was based on the report reviewed in the JOURNAL for May 26, page 875.

Substitution Sought by New York City Line

Representing that it may be only a matter of days before the Eighth & Ninth Avenue Railway, New York, will have to cease operation for want of revenue, the company's receivers and their attorney appeared on May 21 before the committee of the whole of the Board of Estimate to urge conversion of its perpetual railway franchises into a franchise for the operation of buses.

The receivers described the company as unable to make operating expenses with its present equipment. Its bank balance they said, was only $300, and for many weeks the receivers and their friends have had to advance cash to meet current operating expenses. Unless some measure of relief is afforded, the receivers said, the company would shut down, operating only one car a day to retain its franchise.

The lines of the Eighth & Ninth Avenue Company run from Fulton Street up West Broadway to Canal, along Hudson Street into Eighth Avenue and from the Battery to Gansevoort Street and then up Ninth Avenue to Broadway and 65th Street, then along Broadway to West 72d Street, then up Amsterdam Avenue to La Salle Street and Broadway, all in the borough of Manhattan.

Results in Indianapolis Do Not Reflect Co-ordination

Net operating revenues in 1927 of the People's Motor Coach Company, now owned by the Indianapolis Street Railway Company, Indianapolis, Ind., were only $17,144. The revenue last year would indicate a 3.4 per cent return instead of an 8 per cent return on the valuation at which the properties were taken over.

Passenger revenue in the year was $459,379, while $1,459 was realized from rentals on charter buses and $2,594 from advertising, making a gross of $463,433. Operating expense, exclusive of depreciation charges, was $348,801. The depreciation charges, at the rate of 15 per cent a year on motor equipment, were $97,487. Had the depreciation charge been 30 per cent a year as demanded by the Public Service Commission, there would have been a deficit of about $79,000.

Over its five routes in the city, the company carried 4,274,340 passengers. Its 39 buses traveled 2,375,566.6 miles in the year. These of course, were results that do not reflect the full program for the operation of the system in co-ordination with the street railway.

In showing assets and liabilities balancing at $554,985, the report placed a value of $314,269 as estimated investment at the beginning of the year. The figure, however, corresponds to the original purchase price for the 39 buses without depreciation for one, two and three years on the equipment.

Out of the earnings of the coach company, the Indianapolis Street Railway had expressed the expectation that, with the services properly co-ordinated, it could meet interest charges and amortize a $500,000 loan made at 8 per cent to supply funds to finance the purchase of the bus company's common stock.

Injunction Against Muncie Buses

Judge Robert C. Baltzell of the southern Indiana district of the federal court has issued an injunction against the operation of buses in Muncie, Ind., by Sumner L. Denny and others who were defendants in a suit brought by the Equitable Trust Company, New York, trustee for holders of bonds secured by mortgages on property of the Union Traction Company.

The suit was predicated on the assertion of the plaintiff that the defendants, in the operation of their bus lines

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under a license issued by the city of Muncie, had failed to obtain a certificate from the Public Service Commission, showing that their lines were of public convenience and necessity. A decree in support of the injunction was entered with the clerk of the court.

Attorneys for the defendants asserted they were unable to say whether they would take an appeal to the Circuit Court of Appeals in Chicago because a motion asking for a stay of an injunction obtained against the defendants in circuit court by Arthur W. Brady, receiver for the traction company, is to be heard soon by the Indiana Supreme Court.

Approve Abandonment on Short Run in New Jersey

Approval of the application of the Coast Cities Railway to substitute bus for railway service between Belmar and Manasquan, N. J., has been announced by the New Jersey Board of Public Utility Commissioners. It was contended that the railway lines had been operating at a loss for the past two years. Bus service is now supplied by the railway between Atlantic Highlands and Manasquan, skirting the coast for the most part and routed through Asbury Park, Avon, Belmar, Spring Lake, Sea Girt and other places. This operation by bus was the subject of a descriptive article contributed to ELECTRIC RAILWAY JOURNAL for Dec. 12, 1925, page 1023, by H. T. Pritchard, vice-president of the Utilities Power & Light Corporation.

Express Service Suggested at Indianapolis

Mayor Slack of Indianapolis, Ind., has suggested that city and electric railway officials prepare a program for rapid transit in keeping with expected growth of the city. The Mayor believes elevated lines from the business district to Broad Ripple, thence to Fairview and Riverside, are the eventual solution. James P. Tretton, operating superintendent of the Indianapolis Street Railway, believes that the city of the future will use subways. The railway recognizes the need for faster rides from the extreme north and east sections of the city to the business district. Express service, like that in Detroit using buses and trolleys, has been suggested as a means of immediate relief.

Would Extend Bus Service

Application has been made by the St. Louis Public Service Company, St. Louis, Mo., to the Board of Public Service to install a new bus line to supplement the Tower Grove Street car line. The buses will run from the end of the street car division into the Lindenwood district which is now served only by buses of the People's Motorbus Company and suburban trains.

Special Service in British Columbia

The British Columbia Rapid Transit Company, subsidiary of the British Columbia Electric Railway, has started an additional coach service between Vancouver and Abbotsford on Saturdays and Sundays only.

50 Miles of Route for Third Avenue Railway

The Surface Transportation Corporation, with other companies of the Third Avenue Railway System, New York, has acquired and is already operating nearly 50 miles of bus routes in Westchester County, including the White Plains-Yonkers line, the Harrison-Rye Beach line, the Mamaroneck Avenue line, the White Plains-Tuckahoe line, the Silver Lake line, the White Plains-Hastings line, and the White Plains-Grasslands line. The new Bronx lines will add 55 route miles, making a total of more than 100 miles of bus routes which will have been added to the system.

These and other facts were brought out in a radio talk made recently by Garrow T. Geer, secretary of the company. He also said:

> The bus companies have been fortunate in obtaining unusually desirable and well qualified men for the bus operating personnel, and the inspiration of new buses, new uniforms, a clean slate, and a magnificent opportunity for transportation service, is a challenge to the new employees to give the public their very best efforts.
>
> It is a great satisfaction to the Third Avenue management that to us has been awarded the opportunity of affording this new service to the people of the Bronx, who for so many years have been the patrons of our railway lines. We feel that they will appreciate the advantages of a coordinated bus and trolley service under one management, the financial and operating reliability of which has long been established.

Line in Washington Authorized

The Capital Traction Company, Washington, D. C., has been authorized to operate a parlor car coach line between 34th and Ordway Streets and 10th and D Streets, northwest. Such service can be operated until otherwise ordered by the commission.

Substitution Being Considered for Lake Ontario Route

Stockholders of the New York State Railways will meet in Rochester, N. Y., on June 14 to consider the proposed early abandonment of the Rochester & Sodus Bay Railroad. James F. Hamilton, president has stated that revenues of the 40-mile line along Lake Ontario and through the lake fruit belt have decreased steadily. He reported a loss of nearly $50,000 for the year 1927 after operating expenses and taxes. Depreciation was not included in this computation.

The single-track interurban is a subsidiary of the New York State Railways and its revenues have been hard hit by the private automobile. There is no competing bus line, but it is understood that the New York State Railways may substitute a bus line.

New Iowa Interurban Service

Buses between Davenport and Clinton, Iowa, operating on a stagger schedule with the present interurban cars between the two cities, operated by the Clinton, Davenport & Muscatine Railway, will be in service early in July, according to R. J. Smith, general manager of the Tri-City Railway, an associate company. Formal application for the permit was made recently. This is the first interurban coach service to be undertaken by the railway.

Taxi Purchase Contemplated by New Jersey Company

Negotiations are under way, according to the Newark *News*, for the purchase by Public Service Co-ordinated Transport of the Yellow Cab Company, Camden, N. J., which operates 47 taxicabs. The price reported is between $400,000 and $500,000. The Public Service has not heretofore embarked upon the taxicab business. The company at Camden, in addition to the cabs, has a large garage and a two-story office building.

Supplementary Service on One Denver Line

A bus will be used along the route of the Denver and Crown Hill line of the Denver Tramway from the city limits of Denver, Col., to the Crown Hill Cemetery, about 1 mile, to supplement the car service. Nothing has been said about discontinuing the car line, but it is understood that if the bus proves satisfactory the company has the right to substitute buses. Recently the company has refused transfers between the city line and the Crown Hill line.

New Line Out of Washington

The Washington Railway & Electric Company, Washington, D. C., may establish a bus line from a mid-city terminal to Rockville, Md., to compete with the existing bus line operated by the Montgomery Motor Bus Company, Inc. It was said the Montgomery Bus Company had been making serious inroads on the patronage of the Rockville line of the railway and the railway company considers it imperative to take such steps, since negotiations entered into by it to take over the Montgomery company have apparently failed.

Would Extend Line in Los Angeles

The Los Angeles Railway Corporation has applied to the California Railroad Commission for a certificate to extend its Florence Avenue coach line in the County of Los Angeles.

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Financial *and* Corporate

Senator Capper Heads Merger Sub-committee at Washington

The Senatorial sub-committee that is to investigate the merger plan, under which it is proposed to bring together the Capitol Traction Company, the railway lines of the Washington Railway & Electric Company and the Washington Rapid Transit Company, has been appointed by Senator Capper, Republican, of Kansas, chairman of the Senate District committee. Mr. Capper himself will head the sub-committee. The other members will be Senators Blaine, Republican, of Wisconsin; Vandenberg, Republican, of Michigan; King, Democrat, of Utah, and Glass, Democrat, of Virginia. It is probable that the committee will assign utilities experts to investigate the merger plan and then come back in the fall to hold hearings.

Authorization for the investigation was contained in a resolution adopted by the Senate. The resolution appropriated $10,000 for expenses.

Four members of the sub-committee, Capper, Blaine, Vandenberg and Glass, voted against a proposal to make a favorable report to the Senate on the joint resolution authorizing the merger. The fifth member of the sub-committee Mr. King, voted in favor of the motion.

The question of valuation will be the most important one in the sub-committee's investigation. The merger plan allows a fixed valuation of $50,000,000, against a valuation of $62,000,000 claimed by the two railways for their properties under the basis allowed by the Public Service Commission in previous cases.

First Report on Consolidated Georgia Properties

The first annual report of the consolidated Georgia Power Company, Atlanta, Ga., has been presented for the purpose of showing the progress made in simplifying the corporate and strengthening the financial structure of the company since its organization on Feb. 25, 1927. It summarizes the efforts made and results attained in co-ordinating, standardizing, and unifying the facilities of the several constituent companies. No detailed comparison is made in this report with the consolidated operations of the properties for the previous year, although the report and the Year Book contain charts and statistics showing the growth and development of the company.

Gross earnings from railway operations were $5,367,510 and passengers carried numbered 99,340,678. Of this number 94,983,871 were carried on the Atlanta system.

The year 1927 witnessed the consummation of a program of complete modernization of the Atlanta railway system. Modern double-truck cars were used to replace all of the old single-truck cars retired from service, with the exception of 26 retained for emergency use. The present equipment includes 407 regular passenger cars, of which 154 are equipped for one-man operation.

Stock Offerings in Montreal

An offering of stock will be made to shareholders of the Montreal Tramways, Montreal, Canada, at $150 a share on the basis of one new share for each five shares held. The present offering means that 10,000 new shares will be offered to shareholders, and at $150 a share will give the company $1,500,000 of new money to be used for general expansion purposes.

This change in the Montreal Tram capital structure will strengthen the position of United Securities which, through Consolidated Securities, Ltd., owns more than 50 per cent of the common stock of the tramways.

At current levels, rights will be worth about $10 each.

Properties Separated in West Virginia

Separation of the railway and lighting properties in Bluefield and Princeton, W. Va., has been effected following an announcement to the effect that the Tri City Traction Company, an interurban, would operate the railway and the Princeton Power Company would handle the electric light systems. All debts incurred by the Princeton Power Company prior to April 30 are to be settled by the traction company and matters pertaining to the electric light system will be under a new corporation, which will continue to be known as the Princeton Power Company, operated as a subsidiary of the American Gas & Electric Company.

Officers of the new company are as follows: S. J. Evans, president and general manager; H. E. DeJarnette, vice-president and chief counsel; S. J. Evans, in charge of railway operations; W. D. Shuff, secretary and treasurer, and E. T. Evans, head of rolling stock.

Two Chicago Issues

The Chicago, North Shore & Milwaukee Railroad received authority from the Illinois Commerce Commission on May 22 to issue and sell $2,700,000 par value of its 6 per cent non-cumulative preferred stock. At the same time, the commission entered a formal order authorizing the Chicago Rapid Transit Company to issue under its first mortgage an additional $3,122,000 of first and refunding mortgage gold bonds, payable in 1953 and bearing interest at 6 per cent to be sold at not less than 80.

Tax Relief Sought for Municipal Railway Employees

Employees of the Detroit Water Board and Department of Street Railways in the future will not have to pay income taxes under an amendment adopted by the Senate. Senator Arthur H. Vanderberg sought to make the exemption retroactive for the years 1925, 1926 and 1927, but this proposal was defeated. If the amendment is accepted by the house and the conference committee on the revenue bill, it will end a controversy extending over several years between the Detroit municipal government and the bureau of internal revenue.

Employees of these two municipal projects were assessed taxes as early as 1923, but these levies were abated by the revenue act of 1924. Taxes since that date have been in abeyance and a ruling of the treasury department in February of this year ordered these employees to pay up three years back taxes.

Changes on Akron Directorate

Wendell L. Wilkie has become a director in the Northern Ohio Power & Light Company, Akron, Ohio. He succeeds the late E. W. Moore, Cleveland, who with his associates founded the Cleveland-Akron interurban line. As a member of the law firm of Mather, Nesbitt & Wilkie, he has been in charge of the legal work of the Akron property for the past six years.

R. P. Stephens, New York, also has been chosen a director. He takes the place of John C. Weadock, New York, resigned.

New Directors in Oakland

Four new directors have been added to the board of the Key System Transit Company, Oakland, Cal., to fill vacancies occasioned by resignations. The new directors, are the four operating vice-presidents of the company: J. P. Potter, operations; H. P. Bell, engineering; C. C. Vargas, finance; and Paul Goldsmith, public relations.

Service Discontinued in Boise

The Public Utilities Commission of Idaho granted permission on the application of the Boise Valley Traction Company, Boise, and the Colonial Trust Company of Pennsylvania to abandon its entire service on and after May 17, 1928. On that date the properties of the railway were sold by special master to John L. Porter, Pittsburgh, who represented the bondholders of the company. This sale was in pursuance of a decree of foreclosure entered by the Federal Court for the District of Idaho on April 12, 1928, this proceeding being brought to foreclose a deed of trust to the Colonial Trust Company and a mortgage of the Idaho Power Company, also the owner of the stock of the railway, against the Boise Valley Traction Company's property.

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Slight Decrease in Louisville Balance

Interesting review of situation in Southern city. More extensive co-ordination ahead. Many notable achievements in realm of operation

DURING the year 1927 there was a marked increase in the density of traffic on the Louisville Railway, Louisville, Ky., during the so-called rush hours. This was met in part by the operation of 118,770 additional car miles during the year, but the relative increase in traffic during the rush hours was very great. The number of passengers carried during the other hours of the day, on the contrary, fell off considerably, so that the problem of furnishing sufficient equipment in rush hour service became extremely acute, The maintenance department functioned so well during the year that the number of cars taken from service on account of car failure was decreased 7.2 per cent compared with 1926, and 16.4 per cent compared with 1925.

In an effort to reduce service interruptions to a minimum considerable study was devoted to the traffic situation. Early in the year the supervisory force was revised in an effort to insure more regular schedules. Three additional line inspectors and two supervisory inspectors were added to the transportation department staff, the latter two being provided with an automobile to enable them quickly to reach any part of the system and render assistance during interruptions to traffic. This materially reduced the length of interruptions to service.

Despite the increase in car miles operated during the year, despite the decreased failure of cars in service, and, despite the fact that there was no change in fare during the year, 1,250,249 fewer passengers were carried in 1927 than in 1926; and, 1,729,954 fewer passengers than in the year 1925. Increased burdens were placed on the operation by reason of the increased number of automobiles and trucks operated, and a considerable program of sewer construction, all of which tended to increase the difficulty of operating cars on regular schedule. Industrial depression was reflected in the company's earnings, which show a decrease of $51,109 compared with 1926.

There were 1,400 more automotive vehicles on the streets of Louisville during 1927 than in 1926; and, some five thousand more than in 1925. The number of automobile licenses issued in Jefferson County during the past five years is compared in the accompanying compilation.

Early in 1926 the Mayor appointed a traffic committee to review the entire traffic situation in Louisville. On Aug. 18, 1927, the committee presented its report, containing a suggested form of ordinance "Regulating the moving travel and traffic upon the public ways of the city of Louisville, Kentucky, and providing punishment for the violation thereof." This ordinance, after intensive study by the traffic committee, the public utilities bureau. and various civic organizations, was revised in part and submitted to the General Council on Jan. 24, 1928, for action by that body.

During the year, the following number of cars passed through the various shops:

Truck shop—minor repairs	1,402
Truck shop—general overhauling	315
Carpenter shop	871
Paint shop	206

The maintenance of car bodies of the older type of cars continues heavy. The repairs to car bodies during the year, due to accidents and due to maintenance has been as follows:

	No. of Cars	Cost
Due to accidents	239	$8,912.07
Due to car body repairs (maintenance)	836	$30,932.32

Increased attention was given during the year to the cleanliness and the attractiveness of car interiors by painting ceilings a lighter shade, renewing curtains, painting seats, etc. Experiments are being conducted in flood lighting the front car dash, designing a suitable illuminated destination sign, and providing more comfortable working conditions for car operators, all of which will tend to increase safety of operation and render the car more attractive to the rider.

The comparative cost of power station operation and maintenance for the past five years is as follows:

1923	1924	1925	1926	1927
$535,380	$514,843	$454,949	$414,818	$426,384

During the past year 45 pieces of special track work were renewed in whole or in part, at a cost of some $84,000, 8,015 ft. of track were reconstructed with new rail, 2,767 ft. with relay rail and 1,078 ft. with the same rail. Of new track construction, 2,642 ft. on Frankfort Avenue from Eastover to Cannon Lane was constructed with new rail, and on 25th Street and St. Cecelia 1,898 ft. was constructed with relay rail, a total of 17,399 ft. During the year a total of 19,275 wood crossties were used.

There were only two fatalities on the city lines in 1927 compared with ten fatalities in 1926. The accident elimination contest was continued on the property with increasing success, as is evidenced from the following table:

	1923	1924	1925	1926	1927
Accidents	3,404	1,825	1,534	1,157	904
Miles operated per accident	3,380	6,390	7,432	10,386	13,399

Comparing the year 1923 with 1927, with an increase of 65.8 per cent in the number of automotive vehicle licenses issued, there was a decrease of 73.5 per cent in the number of preventable accidents, and an increase of 400 per cent in the car miles operated per accident. There is to be taken into account also the fact that not only are the streets considerably more congested with automotive vehicles, but the population of Louisville increased from 287,000 in 1923 to 327,000 on Dec. 31, 1927.

The bus competition operated under the name of the Peoples Transit Company, which was stopped by injunction

RECORD OF AUTOMOBILE LICENSES ISSUED IN JEFFERSON COUNTY

	1923	1924	1925	1926	1927
Trucks	6,250	7,400	8,063	8,610	8,449
Passenger automobiles	29,891	40,916	46,379	50,034	51,500
Motorcycles	.....	235	247	249	302
Dealers	.....	88	97	105	90
Free	.....	.....	.....	325	416
Total	36,141	48,639	54,806	59,323	60,757

COMPARATIVE INCOME STATEMENT OF THE LOUISVILLE RAILWAY

	1927	1926
Operating Revenues:		
Revenue from transportation	$4,608,732	$4,665,693
Other operating revenues	203,462	197,612
Total operating revenues	$4,812,195	$4,863,305
Operating expenses	3,260,563	3,275,786
Net revenue from operations	$1,551,631	$1,587,518
Taxes	461,000	461,000
Railway operating income	$1,090,631	$1,126,518
Bus operating income	*85,977	*31,566
Total net operating income	$1,004,654	$1,094,952
Non-operating income:		
Louisville and interurban railroad. Net income	73,910	82,903
Other non-operating income	9,607	10,228
Total non-operating income	$83,517	$93,131
Gross income	$1,088,172	$1,188,083
Deductions from gross income:		
Interest on bonds and notes	651,750	651,750
Miscellaneous debits	4,928	2,025
Total deductions	656,678	653,775
Balance available for dividends on stock	$431,493	$534,308

*Deficit.

COMPARISON OF REVENUE, TRANSFER, SCHOOL AND FREE PASSENGERS CARRIED BY THE LOUISVILLE RAILWAY

	1923	1924	1925	1926	1927
January	7,861,986	8,435,464	8,297,839	8,633,543	8,228,073
February	7,371,936	7,957,906	7,562,261	7,590,218	7,526,871
March	8,496,345	8,515,182	8,354,832	8,274,959	8,344,023
April	8,341,493	8,422,780	8,214,226	8,145,383	8,157,692
May	8,920,188	8,844,856	8,469,877	8,603,531	8,459,179
June	8,211,428	8,097,217	7,837,978	7,905,530	7,830,355
July	7,943,088	7,712,320	7,648,982	7,697,183	7,493,705
August	7,827,996	7,549,678	7,744,573	7,471,624	7,482,858
September	8,125,974	7,850,813	7,995,353	8,004,341	7,781,967
October	8,257,865	8,334,069	8,395,428	8,235,552	8,206,499
November	8,069,261	7,720,786	8,048,480	7,894,275	7,696,159
December	8,250,837	8,298,196	8,564,736	8,196,721	8,197,230
Total	97,670,397	97,739,267	97,134,565	96,654,860	95,404,611

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granted under date of Jan. 28, 1927, was referred to in report for the year 1926 as pending decision in the Court of Appeals. Under date of June 24, 1927, the Court of Appeals affirmed the decision of the lower court, sustaining the contention of the railway that the Peoples Transit Company should not be permitted to operate without a franchise.

Following this decision intensive study was devoted to a co-ordinated electric car and bus system of transportation for the city and suburbs. Changes in city administration delayed consideration of the matter by the city officers.

On Jan. 10, 1928, the officers of the city held a hearing on the matter of bus operation and took under advisement the request of the Louisville Railway to create and sell a franchise for the operation of buses. Attached to this request was a proposed ordinance, which was submitted to the officers of the city. Several provisions of the ordinance drafted by the railway met with objection on the part of the city officers, and a number of conferences were held. On Feb. 7, 1928, Mayor Harrison presented to the General Council of the city an ordinance creating a new bus franchise. While the ordinance presented by Mayor Harrison is more restrictive than the railway's draft would have been to the company as holder of the franchise, the officers regard it as a workable arrangement and have stated that if the franchise is created in the terms suggested by Mayor Harrison the company will bid on it and operate under it. This has since been done.

To add to the railway's equipment, the directors last summer authorized the purchase of the automotive vehicles of the Peoples Transit Company, through which it acquired buses necessary in feeder bus lines. The company stands now in a position to commence building up a comprehensive bus and rail car transportation for the city, as soon as it is legally permitted by the city to do so. All the company needs is the legal right to operate buses and a legal means of determining and rendering the type of service the people desire and are willing to pay for.

During 1927 the current dividends were paid on preferred stock 2½ per cent on April 1 and 2½ per cent on Oct. 1. Dividends of $1 a share were paid on common stock on April 1 and on July 1; and, on Dec. 13, 1927, there being more than enough balance from operation in 1927 to pay an additional dividend on common stock of $1 per share, that dividend was declared payable on Jan. 3, 1928. There were paid out of 1926 earnings $3 per share in common stock dividends, and a like amount out of 1927 earnings.

As was noted in ELECTRIC RAILWAY JOURNAL previously, the American Museum of Safety announced that the Anthony N. Brady Gold Medal, which had not been given since 1914, was awarded the Louisville Railway, the prize committee indicating in its report that the company was the "safest street railway in America."

Barstow Interests Buy Binghamton Bonds

The William S. Barstow interests, which own the Binghamton Light, Heat & Power Company, Binghamton, N. Y., have obtained control of 51 per cent of the block of $1,782,000 general consolidated 5 per cent bonds of the Binghamton Railway. In consequence the Barstow Company is likely to become the outstanding creditor and claimant against the railway. In any event the purchase eliminates the Associated Gas & Electric Company, New York, from further consideration in the plan for control of the railway.

The sale of the property under foreclosure has been postponed indefinitely pending determination by a special master of the matter of priority of liens of the secured creditors of the railway.

Would Abandon Portion of Line in Cortland

The Cortland County Traction Company, at the request of the city of Cortland, applied to the Public Service Commission May 18 for permission to abandon a part of its line in Cortland. It was alleged that further operation of that part of its system was no longer necessary for public convenience.

Brazil Properties Bought by Electric Bond & Share

The Electric Bond & Share Company has purchased control of important public utilities of the state of Rio Grande do Sul, Brazil, including Companhia Carris Porto Alegrenses and the Companhia Energia Electrica Rio Grandense, respectively operating Porto Alegre tramway and power system. Control of the two companies will be assumed by Electric Bond & Share Company on May 30. The price paid for the two companies has not been disclosed. The railway will be rebuilt.

Increase in Revenue Passengers in Winnipeg

Industrial development in Manitoba, Canada, has been reflected in the 1927 increased railway earnings of the Winnipeg Electric Company, Winnipeg. During that year the railway carried 60,045,833 revenue passengers compared with 57,985,144 during 1926. The gross receipts of this utility increased $124,000. These better conditions were referred to by A. W. McLimont, president, in his annual statement to the directors.

In accordance with franchise agreements and to meet service requirements, the Winnipeg Electric Company made certain additions and improvements to its railway property in 1927. An extensive track rehabilitation program materially improved the company's roadbed. The company also added to its fleet three Reo 21-passenger buses, three Studebaker 21-passenger buses, and ten Mack 25-passenger buses.

The report refers to the demonstrations of the value in customers' good will due to the policy of distributing the company's securities through the medium of customer ownership campaigns. There are 4,014 local preferred stockholders compared with only a few in 1924.

Would Abandon Line in Illinois

Abandonment by the Illinois Traction, Inc., of 2.7 miles of line in Champaign County, Ill., is proposed in an application made public May 23 by the Interstate Commerce Commission. The line extends from a point known as State Road Elevator, on the Ogden-Homer branch of the main line, to Homer, Ill.

The applicant states that it is now operating the line at a loss and that the Illinois State Highway Department desires to use the roadbed for construction of a highway between State Road Elevator and Homer.

Negotiations Reported for Sale of Harrisburg Bridge

The Harrisburg Railways, Harrisburg, Pa., is understood to have under consideration a proposal for the purchase by Frank A. Slack of the railway's 60 per cent interest in the People's Bridge Company, owner of the Walnut Street bridge across the Susquehanna River. Mr. Slack proposes to erect a new viaduct at a cost of $800,000. The railway bought stock in the bridge company more than twenty years ago. The present bridge has been in use since 1890. It cost $200,000.

Power Plant in Oklahoma Sold

Halford Erickson, vice-president, H. M. Byllesby & Company, announces the purchase by the Oklahoma Gas & Electric Company of the 13,000-kw. Belle Isle generating station of the Oklahoma Railway in Oklahoma City, Okla. Consummation of this transaction follows the recent leasing of this station by the Oklahoma Gas & Electric Company together with transmission lines owned by the Oklahoma Railway, including 33,000-volt transmission lines from the Belle Isle plant to Norman, Guthrie and El Reno, and all substation equipment not used exclusively for railway transportation.

Removal of Non-Paying Oakland Lines Under Way

With the approval of the California Railroad Commission removal of all rails, poles and overhead of two lines abandoned as non-paying by the Key System Transit Company, Oakland, has been started. The lines in question are the San Lorenzo, near San Leandro outside of the Oakland city limits, and the second section of the Ashby Avenue route in Berkeley.

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Legal Notes

CALIFORNIA — *Duty of Pedestrian in Crossing Interurban Rights-of-Way Defined.*

The tracks of an interurban railway were on a right-of-way but closely adjoining them was a sidewalk commonly used by pedestrians, and the district was laid out in streets and blocks with business buildings and residences adjacent to the car line on either side. The court held that a pedestrian attempting to cross such tracks must look and listen before crossing, the same rule being applicable as that applying to steam railways, though if the place was one where the public commonly crossed the tracks, in going to a street on the opposite side, evidence to this effect would throw light on the question of the extent of contributory negligence. [Phillips vs. P. E. R. Co., 264 P., 538.]

CONNECTICUT—*Contract for Percentage Payment by Railway for Use of Streets Held Valid. Payment not a "Tax."*

The grant of a city to a street railway to operate cars on its streets, where the company's charter required the consent of the city, was an act of the state so far as the necessary power was committed to the municipality by the state, and the city could attach to the grant any conditions it choose, provided these conditions did not conflict with the law. The condition that the corporation pay 2 per cent of its gross earnings to the city for such permission was valid, and the city was not required to show that it had been put to any additional expense by the construction and operation of the cars. Such a payment did not constitute a "tax" within the meaning of general statute 1887, section 3920, as a tax, according to current meaning, is a burden or charge levied upon persons or property by governmental authority for governmental or public purposes. Where a railway had exercised privileges under such a franchise for 28 years, making the payments required, it was held not entitled to attack the condition as *ultra vires,* where it proposed to continue the exercise of all the rights given to it by the city. Even if the city had no power to impose such a charge but had power to consent or refuse to grant a franchise to a public utility, the latter is bound by the conditions imposed where it has accepted the grant and has operated under it and proposes to continue to do so. [City of Hartford vs. Connecticut Company, 140 A., 734.]

FEDERAL DISTRICT COURT—*Word "railroad" in Bankruptcy Act Includes Street Railway.*

A railway company discontinued service and later was adjudicated a bankrupt. The state and city in which it operated asked that the judication be vacated on the ground that the bankrupt was "a railroad corporation" and therefore exempted from the federal bankruptcy act. The court differentiated the case from that of other cases where electric railways were held not to be "railroads," such as In Re Grafton Gas & Electric Light Co. (253 F., 668), Omaha Street Railway vs. Interstate Commerce Commission (33 S. Ct., 890), and declared the word "railroad" in the bankruptcy act included a street railway. [In re Columbia R., G. & E. Co. 24 F. (2d), 828.]

FEDERAL DISTRICT COURT—*Boston Elevated Railway Liable to Federal Income Tax.*

Attorneys for the Boston Elevated Railway claimed that because the company, in return for payments and guarantees by the commonwealth, had abdicated its right to manage its property and affairs in favor of public trustees appointed by the Governor, it was not subject to the federal tax on corporations. The district court held, however, that as the business was still conducted in the name of the company and as the enabling act expressly provided that the trustees "shall be deemed to be acting as agents of the company and not of the commonwealth," and because of other wording in the act, the company was liable for the tax. [Boston E. R. Co. vs. Malley 24 F. (2d) 758.]

KANSAS — *Prospective Passenger, Hit by Projecting Steps of Interurban Car, Is Guilty of Negligence.*

A person who intends to get on an interurban car as a passenger at a place provided for that purpose, who goes to that place, sees a car approach and signals it to stop but stands so close to the track that he is struck by the projecting step of the car as it passes him, is guilty of contributory negligence as a matter of law. [Kern vs. K. C. L. & W. Ry., 264 P., 1067.]

KENTUCKY — *Increased Service Not Necessarily Great Public Convenience.*

An applicant for a bus franchise agreed to operate buses every hour over routes already served by buses which ran only every other hour, carrying about one-third of their capacity per trip. The Court of Appeals upheld the decision of the Commissioner of Motor Transportation denying the application on the ground that the public's needs and convenience did not require a more frequent service. [Barnes vs. Consolidated Coach Corporation, 3 S.W. (2d), 1087.]

MASSACHUSETTS — *Person Injured In Crowded Subway Station.*

The fact that a subway station is crowded with people hurrying to enter cars and that similar conditions exist at other times is not sufficient to establish the negligence of the railroad so as to authorize recovery by a passenger injured by the crowd on the platform. [Martin vs. Boston E. R. Co., 160 N.E., 300.]

NEW JERSEY—*Authority of Commission in Limiting Franchise Upheld.*

The Public Utility Commission granted a certificate to a bus operator on condition he would not carry through passengers between the two terminal towns on its route and that he would not carry local passengers within these two towns. The reasonableness of these limitations was upheld by the Supreme Court. [Hunter vs. Board of P. U. Comm. et al, 141 A., 90.]

VIRGINIA—*Change in Transfer Point, Authorized by Police but Contrary to Ordinance, Held Invalid. Company Held Responsible for False Arrest and Malicious Prosecution of Passenger in Transfer Case.*

A city ordinance, passed in 1908, required the issue of transfers at various specified points. Another ordinance, passed in 1899, authorized the railway company to enforce reasonable regulations as to transfer tickets and systems of transfer to prevent fraud. At a conference held in 1924 between officials of the Police Department and of the railway company to reduce congestion at one of the specified transfer points, it was agreed desirable to require passengers passing the point on certain car lines to transfer at another intersection. Notices of this proposed change were posted and other means were taken to warn passengers of the change. More than two months later, a passenger transferred at the old corner, but declined to pay another fare or get off the car after his transfer was refused. He made no other disturbance, but the conductor had him arrested, and he spent 30 minutes in the Police Station, after which he was released on bail. The next morning the company's attorney prosecuted him in the police court for disorderly conduct, but the case was dismissed. It was alleged that the arrest had been made under general instructions issued by the company. In a later action for false arrest and malicious prosecution brought by the passenger against the company, the Virginia Special Court of Appeals held that neither the agreement between the company and the Police Department nor the right of the company to establish regulations on the use of transfers gave it authority to change the location of transfer points, as they had been fixed by the city ordinance. Hence there was no obligation on the passenger to pay an extra fare or leave the car. The court also held that the instructions issued by the company to its employees made it responsible for the prosecution and warranted the trial jury in assessing punitive damages. A verdict of $2,000 against the company was upheld. [V. E. & P. Co. vs. Wynne, 141 S.E., 829]

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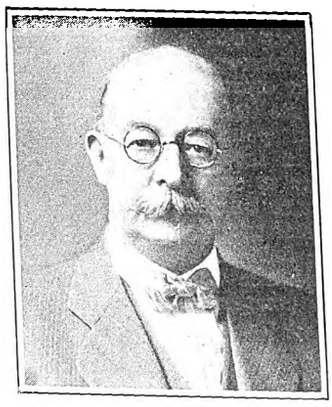
Personal Items

Walter L. Adams Heads New Massachusetts Organization

"From horse car driver to street railway rehabilitator" would be a fitting title for Walter L. Adams of Milford, Mass., recently appointed president and general manager of the reorganized Milford, Framingham, Hopedale & Uxbridge Street Railway (formerly Milford & Uxbridge Street Railway). He is typical of the men who are doing so much to bring New England's street railways to their pre-war financial standing.

It was in 1888 that Mr. Adams had



Walter L. Adams

his first experience in railroading as a horse-car driver on the old Newbury & Amesbury Railway. His run, now remembered only by the "old timers," was on the Merrimack branch. He continued as a driver for two years and later, when cars came into existence there, he was promoted to foreman of the carhouse. Soon after when the lines were electrified his personal study and knowledge won for him the position of electrical engineer. In this capacity he received the fundamental training which stood him in good stead later.

Greater opportunity was offered him in Connecticut. In 1892 he accepted an offer to go there and equip the Norwich Street Railway with electricity. It was then a horse-car road. He was made superintendent and electrical engineer. In a short time an aggressive campaign resulted in the complete change-over and his work was successful. For a brief period he was connected with the Westinghouse Electric Company as an engineer, returning later to the Norwich Street Railway. This time he was made superintendent of the Montville Street Railway where he stayed until 1903. After his work there he went to Milford and became superintendent of the Milford & Uxbridge Street Railway. Reactions following war time inflation resulted in the company's going into a receivership on Aug. 4, 1926. Mr. Adams was appointed receiver. Early in May, this year, the company was sold under order of the Supreme Court to the Citron-Byer Company of New Jersey. Mr. Adams was retained by the new owners as president and general manager. He is also president of the Milford, Framingham & Uxbridge Coach Company.

Mr. Adams was born in Newbury, Mass., in 1858. He was educated in the Newbury public schools.

F. W. Samworth Holds Important West Virginia Post

F. W. Samworth is now serving as district general manager of the Ohio Valley Electric Company and its affiliated companies. He has before him the gigantic task of carrying forward the development work incident to the comprehensive program initiated since the city and interurban lines in West Virginia passed from control of the Appalachian Electric Power to the Central Public Service Corporation. More recently the Cannon Ball Transportation Company and the Interstate Motor Transit Company were purchased by the Southern Gas Securities Company, a subsidiary of the Central Public Service Corporation. The Central Public Service Corporation now controls all of the urban and interurban transportation systems in and between Huntington, W. Va., and Portsmouth, Ohio. The services will be co-ordinated with other transportation companies owned by the Central Public Service Corporation.

Mr. Samworth started his electric railway career in 1910 as a motorman with the Wilmington City Railway, Wilmington, Del. Prior to his position in Huntington and the assumption of his present job, he worked successively as

F. W. Samworth

motorman, receiver, dispatcher, superintendent and general superintendent.

Mr. Samworth was born on Feb. 23, 1892, at Wilmington. His education was received at the Mount Herman School, Mount Herman, Mass.

H. R. Bowie Advanced on Penn-Ohio

H. R. Bowie has been appointed auditor of the Pennsylvania-Ohio Power & Light Company and Pennsylvania Power Company, and auditor and secretary of associated companies of the Penn-Ohio System, Youngstown, Ohio. In this work he succeeds F. E. Wilkin, who resigned to join the staff of Stevens & Wood, Inc.

Mr. Bowie has been assistant auditor of the Penn-Ohio System for the last nine years. During the war he served in the cost accounting section of the army ordnance department. Stationed in New Haven, Conn., he had charge of the government accounting of one of the largest army contracts at the plant of the Winchester Repeating Arms Company. Prior to his war service Mr.

H. R. Bowie

Bowie was an accountant for the Pacific Light & Power Company and Southern California Edison Company. He is a native of Uniontown, Pa., and was graduated from the University of Southern California in accounting and commercial law.

Obituary

W. H. McLarin, president of the Fairburn & Atlanta Railway & Electric Company, Fairburn, Ga., since 1922, died on May 20. Mr. McLarin was 75 year old.

Frank Stark, associated with the late E. P. Shaw in the construction of the Salisbury Beach & Plum Island Street Railway. lines over which he served as superintendent for many years, died in Newburyport, Mass., on May 15. He retired from active work about five years ago, just previous to which he had been starter for all lines centering in Market Square, Newburyport, into which both the Eastern Massachusetts Street Railway and the Massachusetts Northeastern operate.

Marc Stanfield, superintendent of the bus division of the Indiana Service Corporation, Fort Wayne, Ind., for the last two years, died on May 5.

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Manufactures *and the* Markets

Manufacturers Talk of Price Cutting

A group of selected letters, discussing who's to blame and commenting on possibilities for reform

MANY manufacturers have testified to the price cowardice of sellers as the chief cause of demoralization in the market place, as a result of the recently published articles by Earl Whitehorne on price cutting. Also many constructive ideas have been advanced. Some purchasing agents have stoutly contested the innocence of the buyer. Others have frankly argued for a broader recognition of the economics of purchasing and more ethical practices. The following series of extracts from letters from the executives of manufacturing companies has been selected from the pile to present a cross-section of the sellers' viewpoint, as it has been reflected by readers of these articles.

Destroying Price Levels for Allied Lines

By a Manufacturer of Control Apparatus

Since the seller has the privilege of either accepting or refusing business, weak-kneed selling is principally to be blamed for the present price cutting situation. . . .

A contributing factor to the bad price situation also lies in the lack of loyalty among the allied industries. While the motor manufacturer may maintain the price on his motors, because of the longer discount which he is receiving from the control manufacturer he has quite a bit of leeway in discount to play with, and does not hesitate at all to turn a good portion of this discount over to the buyer. Time and again we control manufacturers are up against a situation where the customer can buy our control cheaper through a motor manufacturer than from us direct. This naturally gives the control buyer a considerable leverage with which to lower the control manufacturer's price.

One-Price Policy a Cure

By a Bearing Manufacturer

The only practical solution is to encourage both purchasing agent and seller to submit closed quotations which shall not be subject to further change. If the manufacturer would stick by his first price the purchasing agent would be unable to gain anything by quasi-crooked purchasing methods. If the purchasing agent would at the outset state that he would not lend himself to such practices and insist upon the best price once and for all, then many of the complaints would be avoided.

Too Much Salesmen's Gossip

By a Pole Line Hardware Manufacturer

We do not believe that the manufacturers who are selling a competitive line are close enough that they can sit down and talk over their difficulties without the conversation being broadcast.

The manufacturers pay too much attention to salesmen's gossip about his competitor cutting prices, but if the competitive manufacturers were so lined up that they could discuss costs with each other, I believe a lot of the trouble would be eliminated.

Most Purchasing Agents Absolutely Square

By a Lighting Equipment Manufacturer

Our experience has been that not much of the temptation for price cutting is due to any desire of the purchasing agents of large buyers to keep us from a legitimate profit. The purchasing agent is more concerned in a fair price, coupled with quality of goods and prompt deliveries.

We find purchasing agents of large buyers are absolutely "square" and willing to see us make a legitimate profit. There are still a few of the "old school" who feel a day's work well done only when they have lied to a bunch of salesmen, thereby keeping their companies from earning a legitimate profit, but that type is fast dying out or being placed in other positions where they are not so harmful to their employers.

Untrained Salesmen a Weakness

By a Manufacturer of Fans and Blowers

The tendency today in our own industry is to have untrained men and place them out in the field. The result is their lack of real engineering ability, their lack of ingenuity in meeting the unusual situation causing them to waver in their determination to sell at the right price, and consequently they 'phone the factory for reduction in price, making their case as strong as possible with the factory that the competitors are cutting prices. Invariably the salesman either deliberately misrepresents conditions or he merely took the word of the purchasing department or the buyer.

Sliding Scale and Reciprocity

By a Controller Manufacturer

There are two other phases of merchandising electrical apparatus that have crept in during the last few years that I feel are detrimental to the business. One is the practice of establishing a sliding scale of discounts, started by one of the large electrical manufacturers, and copied by many others in self-defense. This system gives large purchasers preferential discounts on account of the potential buying power of these big customers, and additional quantity discounts worked out on a sliding scale, paid in the form of rebates at the end of the year. Any manufacturer expects to make a certain over-all profit on his products and in order to give big discounts, his list prices must be based accordingly. The customer of small purchasing power consequently pays an excessive price for the apparatus that he buys and the additional profit made on these sales helps the large and powerful purchaser to obtain his goods at a discount.

The other condition is the use of reciprocity to coerce purchasers to buy electrical equipment. The ultimate outcome, if the buyers of electrical equipment do not offer strenuous resistance, would be to eliminate the small electrical manufacturer who does not have big tonnages of steel and other commodities to place. This company has suffered to a considerable extent from the reciprocity pressure, as a number of good sized orders which were about to be placed with us have been diverted to the large manufacturers due to threats on their part to cease buying from the customer unless the orders were placed with them.

Product Prestige Proof Against Price

By an Insulator Manufacturer

The purchasing agent is simply a salesman on the other side of the fence or a salesman a purchasing agent with change of residence and both aping the Dutch and Indians on the Manhattan purchase—where both thought they had, and wondered if they had, put over a good deal.

The purchasing agent, in a seller's market, doesn't dare ask, "Is this your best price?"—the sales agent insults easily. So, in a buyer's market, the purchasing agent dares and does ask and by the time this reaches the sales end it is amplified orally into a demand and visually into an ogre across the desk.

Constructively, I will say that I don't blame either side; that the most salutary movement among the large buyers is the selection of engineers of purchase instead of purchasing machines (clerks). To an engineering mind, one need not get blue in the face trying to explain that the reason "Your price is high" on 60,000 bolts (insulators?) is that there are 50 different kinds of steel and as many methods of making bolts.

Finally, all this dilemma may be avoided by making and selling a product so good that buying and using it is a pleasure not to be contaminated by "an extra 10 and two 5's."

Exhibitograph No. 10

BIG SHOW!

A.E.R.A. Exhibit Committee Reports

to May 31

186 Exhibitors

103,613 Sq.ft. of Space Sold

BIGGER AND BETTER THAN EVER

Tie Requirements Will Decline

As the day of large railroad expansion is past and the yearly increase in track mileage has greatly slowed down, there is seen a prospect of a diminishing demand for crossties until the minimum annual renewal, as fixed by the life of treated ties, is reached. When this point is reached, only such increase in the demand may be expected as will be due to the construction of new lines or the addition of tracks to existing facilities.

Treated ties have been used for years in increasing numbers until in 1926 the treated ties were 69 per cent of all ties used. In 1923 the amount of treated ties in use was 50 per cent and if the

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rate of increase of the past three years continues, by 1932 practically all ties used will be treated ties.

The effect of the treated tie on the number of ties required for renewals, according to Earl Stimson, chief engineer of maintenance of the Baltimore & Ohio Railroad, is clearly indicated by the number of ties used and the total miles of all tracks on which renewals were made, for which the figures for the years 1921 to 1926, inclusive, are available: In 1921, there were used 86,521,556 ties in 379,254 miles of track, or 228 ties per mile. In 1926, there were used 80,745,509 ties in 394,945 miles of track, or 204 ties per mile.

Thus, notwithstanding the fact that there was an increase of 15,691 miles of track during this period, 5,776,047 less ties were required for renewals in 1926 than in 1921.

In 1926 there were used for renewals 80,745,509 ties, or 204 per mile of track, and in the same year there were used for the construction of additional tracks 9,530,926 ties, or about 2,600 ties per mile of track. The decrease in renewals since 1921 is 24 ties per mile of track, or at the rate of 4 ties per mile, per year. The net increase in track mileage for the same period is 2,615 miles per year, and for the purpose of computation assume a gross added mileage per year of 3,000, which will require a total of 7,800,000 ties to construct.

Assuming a twenty-year life for treated ties, with all ties in track treated, the renewal will finally resolve itself into 130 ties per mile per year. Projecting by the straight line method, the present rate of decrease of renewals of four ties per mile per year, it will require 18½ years to reduce the 1926 renewal of 204 ties per mile a year to this figure of 130 ties per mile a year. This will be in the year 1944. When this state of renewals is reached the annual renewal requirements will be uniform and for the 1926 mileage of 394,945 will be 51,342,850 ties.

With this, however, must be considered the ties used in constructing new lines and extensions during this period which are assumed at 7,800,000 per year and which gives a total for the 18½ years of 144,300,000 ties, of which about 40,000,000 ties would have been renewed at the end of the 18½ years.

The average renewal in this group at the end of the 18½ years would be approximately 4,000,000, which added to the 51,342,850 ties required for the 1926 mileage, gives a total of 55,342,850 ties for the 1944 renewal, plus the 7,800,000 for the construction of new lines and extensions, making a total of 62,142,850 ties to meet the demands in the year 1944, as compared with the demands of 1926 of 90,276,435 ties, which is a reduction of 31 per cent.

At this point the full benefit of the treated tie has been secured and the average low level of crosstie requirements has been reached. Beyond this point the renewals per mile should remain stationary, but the total number of ties required for both renewals and for new tracks will increase as the track mileage increases.

METAL, COAL AND MATERIAL PRICES
F. O. B. REFINERY

	May 29 1928
Metals—New York	
Copper, electrolytic, cents per lb	14.525
Copper wire, cents per lb	16.625
Lead, cents per lb	6.30
Zinc, cents per lb	6.475
Tin, Straits, cents per lb	50.625
Bituminous Coal, f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	4.175
Somerset mine run, f.o.b. mines, net tons	1.875
Pittsburgh mine run, Pittsburgh, net tons	1.8
Franklin, Ill., screenings, Chicago, net tons	1.70
Central, Ill., screenings, Chicago, net tons	1.5
Kansas screenings, Kansas City, net tons	2.50
Materials	
Rubber-covered wire, N. Y., No. 14, per 1,000 ft.	5.65
Weatherproof wire base, N.Y., cents per lb.	17.125
Cement, Chicago net prices, without bags	2.05
Linseed oil (5-bbl. lots) N. Y., cents per lb.	10.8
White lead in oil (100-lb. keg), N. Y., cents per lb.	13.75
Turpentine (bbl. lots), N. Y., per gal.	$0.59

Air-Magnetic Brake Test Made

Demonstrating the operation and effectiveness of its air-magnetic brake, the Cincinnati Car Company gave a series of tests on the tracks of the Indianapolis & Southeastern Railway, on May 25 under the supervision of the A. C. Nielsen Company of Chicago.

The tests were made with the Cincinnati experimental car on a measured stretch of track. It will be noted from the accompanying table that the air-magnetic brake stopped the car in approximately two-thirds of the time and distance required by the air brake alone. It is also interesting to note that the efficiency of the air brakes alone was decreased considerably on the greased track while the magnetic brake alone stopped the car in nearly the same distance on the oiled track as on the dry track, thus illustrating the magnetic function of the brake.

LIST SHOWING COMPARISON OF AIR-MAGNETIC BRAKES WITH AIR BRAKES ALONE AND MAGNETIC BRAKES ALONE

Speed of car at brake application was 60 m.p.h.

	Test	Track	Distance to Stop, Feet	Line to Stop, Seconds
Air brakes only	1	Dry	1,100	22
	2	Dry	1,162	23 2/5
	3	Oiled Sanded	1,958	38 1/5
Magnetic brakes only	1	Dry	2,048	40 2/5
	2	Dry	2,036	39 2/5
	3	Oiled	2,116	42 2/5
Air-magnetic brakes	1	Dry	755	14 2/5
	2	Dry	722	14
	3	Oiled	1,357	29 1/5

ROLLING STOCK

Northern Ohio Power & Light Company, Akron, Ohio, has received one gas-electric drive, urban type Twin Coach from the Twin Coach Corporation, Kent, Ohio.

Cumberland & Westernport Transit Company, Frostburg, Md., has purchased two 100-hp. six-cylinder White buses.

Interborough Rapid Transit Company, New York, has ordered G.E. equipments for the conversion of 30 trailer cars to motor cars.

Dallas Railway & Terminal Company, Dallas, Tex., will purchase about fifteen Peter Witt street cars at an approximate cost of $240,000 according to plans being made by city officials and the railway.

Worcester Consolidated Street Railway, Worcester, Mass., has ordered ten 33-passenger, Yellow coaches.

Indianapolis & Southeastern Railway, Indianapolis, Ind., is reported to be buying ten cars from the Cincinnati Car Company.

TRACK AND LINE

Berkshire Street Railway, Pittsfield, Mass., is planning to install a 600-ft. diamond switch for the benefit of trolley service to employees of the General Electric Company. The work is to be done at the same time the city does paving work in that section, bids for which are now out.

Springfield Street Railway, Springfield, Mass., will soon begin the replacement of 2,746 ft. of double track on State Street between the New York, New Haven and Hartford Railroad crossing and Benton Street. Progress is being made in replacing the single tracks on a somewhat longer stretch on Wilbraham Road, from the New York, New Haven & Hartford crossing to the eastern end of the line.

Northern Ohio Power & Light Company, Akron, Ohio, is laying new double track on Cornell Street in Barberton.

SHOPS AND BUILDINGS

Appalachian Electric Power Company, Charleston, W. Va., plans a substation to cost about $150,000.

Union Electric Light & Power Company, St. Louis, Mo., is planning a substation to cost approximately $200,000.

New York Central Railroad, New York, is receiving bids for a 2,000-kw. rotary converter and a 2,100-kva. transformer for substation service.

Ohio Public Service Company, Cleveland, Ohio, will build an addition to its Edgewater power plant to cost $450,000.

TRADE NOTES

C. O. Bartlett & Snow Company, Cleveland, Ohio, announces the appointment of J. R. Allison, in its Pittsburgh office at 406 Bessemer Building. Mr. Allison has a wide experience in both maintenance and construction in steel mills and railroads.

Northern Engineering Works, Detroit, Mich., recently appointed the Interstate Supply Company, Philadelphia, Pa., as direct factory representative for the Philadelphia district; W. H. Beyer assuming charge of the account.

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Capitalize Comfort

The days of uncomfortable seating equipment are giving way to spring upholstered seats of rattan, leather and plush.

Brill Seat No. 301 is particularly well adapted for single-end cars and buses. Upholstered in plush or leather obtainable in a wide range of colors, textures and patterns and constructed with loose, air and spring type cushions, it is unusually attractive and comfortable.

This type seat was the choice of the Rockford Public Service Company for their single-end interurban type cars. There is a distinctive color scheme for each of the seven car interiors. The seats are upholstered in leather of a corresponding color. This feature combined with the comfortable riding qualities of the Brill No. 301 type seat has much to do with the popularity of Rockford Service.

Specify Brill Seats—it pays.

THE J. G. BRILL COMPANY
PHILADELPHIA, PA.
AMERICAN CAR CO. ST. LOUIS MO. — G.C. KUHLMAN CAR CO. CLEVELAND, OHIO. — WASON MANF'G CO. SPRINGFIELD, MASS.

Brill Seats Build Transportation Sales

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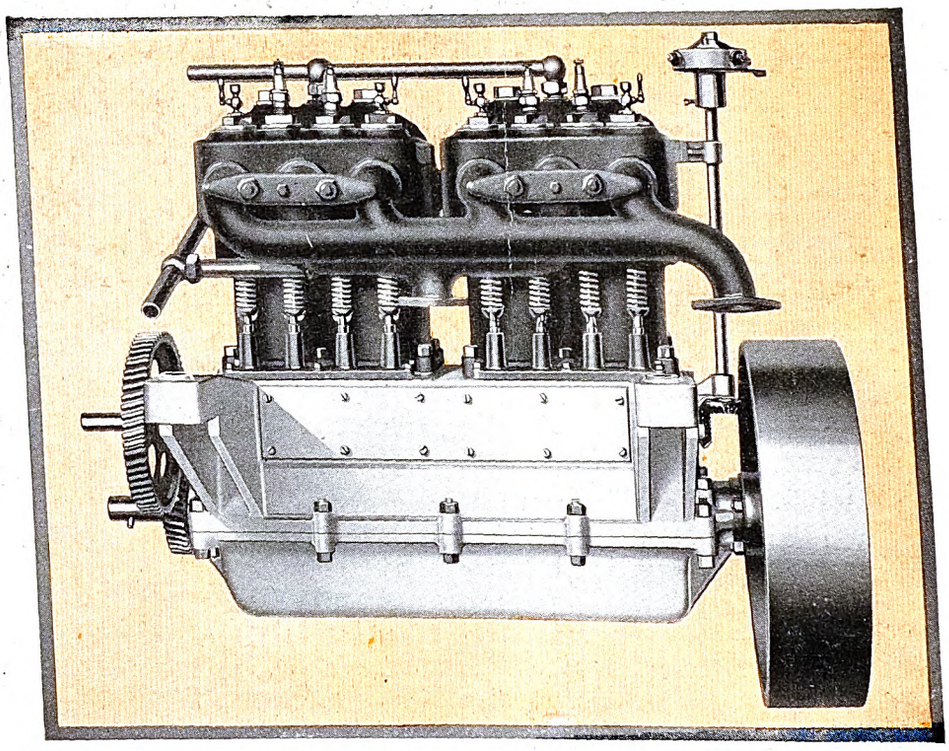
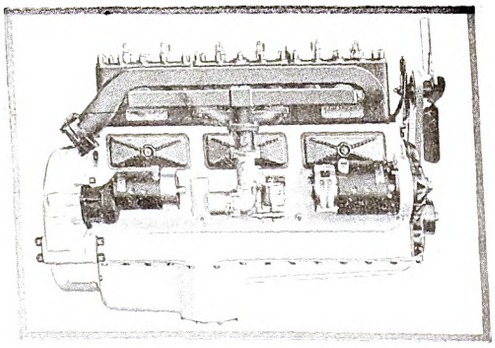


a-826-LC

The First Waukesha Engine—40 Roaring Horse Power

The Roaring Forties

More than twenty years of steady progress stand between the first Waukesha engine and the present highly refined powerful coach engines of today. During that period the Waukesha Motor Company has introduced the demountable cylinder head, fully enclosed valve gear, the Ricardo combustion chamber, the truncated non-rocking cylinder block, over-size chrome-nickel steel crankshaft, and the super-rigid "girder" type crankcase, many of which are still exclusive Waukesha advantages.



D-804-S

Today's Quiet, Smooth 120 H.P. Engine

No coach engine is truly modern without at least some of these important features, and only a Waukesha powered coach has them all. To fully appreciate the progress that has been made in this art the small picture at the left shows the present 120 H.P. Waukesha Motor Coach Engine. Send for bulletin No. 592 giving full particulars.

A-843-LC

AUTOMOTIVE EQUIPMENT DIVISION

WAUKESHA MOTOR COMPANY

Waukesha *Eastern Sales Offices* *Eight W. 40th Street* *New York City* **Wisconsin**

Exlcusive Builders of Heavy Duty Automotive Type Engines for Over Twenty Years

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ELECTRIC RAILWAY JOURNAL

McGraw-Hill Publishing Company, Inc. JUNE 9, 1928 Twenty Cents Per Copy

One of a fleet of Six-Cylinder White Busses in the service of the Boston Elevated Railway. The Boston Elevated operates 100 White Busses and 47 White Trucks.

A Complete Line of Busses for Electric Railway use

THE White Company's reputation for making quality equipment, correctly designed, goes back to the earliest days of bus transportation. In succeeding years the successful performance of thousands of White Busses has steadily strengthened the company's outstanding leadership as a bus manufacturer. Today there is a complete line of White Busses—fours and sixes—a model to meet the exacting requirements of every phase of bus operation.

WHITE BUS MODEL 53—The quality small bus, seating from 16 to 21 passengers, is designed for profitable operation on routes where large busses are impractical.

WHITE BUS MODEL 50B—The quality four-cylinder large bus seating 25 to 29 passengers. The many hundred now on the road have demonstrated conclusively that this model is a consistent and dependable money maker.

WHITE SIX-CYLINDER BUS MODEL 54—The White Six-Cylinder bus with its 100 hp. motor and four-wheel Westinghouse air brakes has established new standards of bus performance. It is the acknowledged leader in the bus field.

THE WHITE COMPANY, *Cleveland*

WHITE BUSSES

and WHITE TRUCKS

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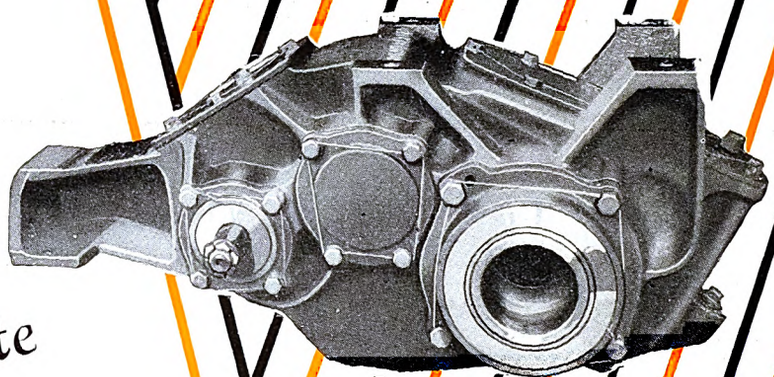
Modern Cars deserve up-to-date Drives



The New W-N Drive

The best of modern cars are no better than their gears. That is why the new W N Drive is being specified on new equipment by so many operating companies.

The W-N, the product of Westinghouse and Nuttall engineering skill, is the highly efficient industrial speed-reducer adapted to electric traction conditions.

The wide helical gears turn noiselessly on Timken Roller bearings in a bath of oil contained in the oil-tight steel case, and transfer the load evenly and smoothly without loss of power and without vibration.

The new W-N drive with its high reduction ratio permits the use of light-weight high-speed motors with their high efficiency; and produces smoother starting, quick acceleration and quiet operation. May we tell you more about the modern drive for modern cars?

R.D. NUTTALL COMPANY
PITTSBURGH PENNSYLVANIA

Canadian Agents:
Lyman Tube & Supply Co., Montreal, Toronto and Vancouver

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Nuttall

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Electric Railway Journal

McGraw-Hill Publishing Co., Inc.
JAMES H. MCGRAW, *President*

Consolidation of
Street Railway Journal and
Electric Railway Review

CHARLES GORDON
Editor

Volume 71 New York, Saturday, June 9, 1928 *Number 23*

Enlivening the Cold Figures

EXECUTIVES surveying the various phases of their company's activities are called upon to study them principally from cold figures. These figures are almost always accompanied by discussions of the trends but these, too, frequently lack the vital punch. The executive may pore over them for hours and at the end of the period be very much in the dark as to the actual trends. At best, he is likely to gain a conception of the results for the past two weeks or two months only, and does not get a picture of the activities for a sufficiently long period to draw really worthwhile conclusions. As a result, he is handicapped in making recommendations or issuing orders for much-needed improvements.

It is particularly difficult when making a special study to have to resort to plain figures. For example, in analyzing the causes of claims for merchandise damaged in transit, if each claim merely was listed with its cause, no very definite conclusions could be drawn. However, if this same information was summarized in a table with the figures totaled for similar causes for each commodity and for all months over a period of a year or more, and these data presented in a carefully prepared table or even plotted on charts, an extremely valuable analysis could be made. Likewise, it would be difficult to make a train-service check over any extended period of time without actually putting down in table form the data on each train for each day, including the number of cars scheduled, the number actually operated, and how many were in excess of schedule or needed in addition to the number actually run.

Companies that are making use of charts and graphs to study the figures for the various activities are reaping much benefit. An excellent example of what can be done with charts is afforded in the experience of the Chicago, North Shore & Milwaukee Railroad, which makes extensive use of them. An article in this issue describes a few of the many forms of tables, charts and graphs used by this company. The success which the North Shore has had with them indicates that they hold many possibilities for other systems, too. The company has realized much improvement in service and has reduced many of its operating expenses because the charts made it possible for the management to get a true picture of the various trends. Also, the practice of using these charts before the department superintendents and their supervisors and foremen, brings to these leaders the actual facts and causes them to realize that all improvements or shortcomings in their respective departments are being noted.

The energy consumption curves used by the North Shore management were very effective in reducing the power demand. The curves were studied periodically by the general manager, the superintendents of the several divisions and finally by those in charge of the motormen. Records were kept of the performance of each individual motorman, and those who were not showing any improvement, or who were getting careless in handling their trains, were given further instructions. The result was that during the first nine months of 1927 the kilowatt hours per car-mile figure was reduced from 2.92 to 2.63. This saving is typical of others made possible by using charts.

Many forms of graphs and tables can be used to show the widely varying phases of an electric railway's operation. There are, however, certain forms which are more suitable for particular subjects and the management must be careful to select the most effective form. The North Shore employs a great many forms of charts, and much of the success in their use of them can be attributed to their careful selection.

Many other companies are making use of charts in various forms, but hardly any are using them to full advantage. There are many possibilities in connection with their use and managements will profit by investigating them thoroughly.

A New Kind of Transportation Needed

MASS transportation of the kind to which the public has become accustomed and which has been developed by the advent of the street car, will always be in demand. But there is plenty of information available to show that mass transportation is only one of the forms of service that can be rendered for carrying people from one point to another. Bearing on this point J. W. Swaine of the United Railways & Electric Company of Baltimore, in an article in this issue, points out that there are trends in riding irrespective of the fare. In other words, since the rank and file of the urban population have become as prosperous as they are today they will ride the cars, regardless of the fare, if the service provided is the service they want. If not, they will seek some other means of travel and pay for it.

Before regulatory bodies the plea made by the company for a particular rate of fare almost invariably is based on the actual cost of the then existing service. Thus there is no incentive to determine if there is some other kind of service that will appeal to the public and so produce an additional number of riders or a greater income from the individual rider. In other lines of business there is unlimited proof that a change has come in the demands of the public. Economists may rave about extravagance in women's dress, but try, if you will, to buy a pair of cotton stockings in any metropolitan store! Try to find a 10-cent movie in any city! Try to get a 5-cent sandwich! Not only has the price gone up because of higher cost, but the quality has been improved to meet the demands of an ever-insistent public.

In transportation, of course, there have been more radical changes than in many other industries, because of the development of the automobile. But the automobile has not robbed its owner of the ability to buy

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other things. Least of all has it deprived him of the desire for more transportation. Rather has it whetted his desire for more transportation. Even with the drive for "two cars to a family" there are many times when it is neither necessary nor desirable to use the auto. In the average family, with its members going to various destinations for the day's work or the evening's pleasure, it is not possible for one vehicle to serve all.

What is needed is not more mass transportation of the type we have known in the past, but development of a type of transportation that people will want to patronize in the future. Whether it will be by street cars or by some other medium is a problem to be worked out, not in the future but now. The modern street cars that are being tried in various places are part of the solution, but even modern cars used in the old-established way will not qualify to fill all the demands of the public. What is needed most is a thorough study to determine what the people will buy in the way of transportation. With that type of transportation to sell, the railway will not have much difficulty in getting the right to furnish it, and at a price that will be remunerative.

Consider the Customer-Owner Carefully in Conversions

BANKERS and utility company executives can ill afford to ignore the bearing which the present disposition to call in high-grade preferred stocks has on the matter of public relations. The theory is correct that in periods of easy money the effort should be made to redeem both high interest bonds and high dividend-bearing preferred stock, but as a writer in the *Electrical World* points out, thousands upon thousands of customers and employees are facing the problem of reinvesting the proceeds of preferred stocks now being redeemed at stated call prices. Probably most of these security owners are reaping a profit on the purchase price of their holdings, but to them the process of conversion or retirement is one with which they are not familiar. A definite reduction in income from the one now being received from preferred issues stares them in the face, and the course for the customer or employee owner to follow needs sympathetic consideration by the investment banker and by the utility man concerned in the distribution of company securities.

The utility company which has conducted vigorous customer-ownership campaigns may well do what it can to send its preferred stock holders financial explanations which will enable them to understand the situation and in the long run to suffer as little as possible from a change due to the working of the unchangeable law of supply and demand. Where the operating or holding company has sought investment money from customers or employees, it now has a real opportunity to perform an important task in public relations by helping its investors to adjust themselves to the new conditions. That all of the companies are not taking advantage of this opportunity is shown by the perfunctory tenor of call notices issued by some of the utilities. True, various incentives to invest in lower-rate preferreds are being offered holders of called stocks, but that has not always been so. In many cases the preferred stock holder need lose little or no income if he "switches" with intelligence, and opportunities still exist, indeed, for actual increase of total income through purchase of listed equities. For others the possibilities of bond appreciation should not be overlooked. There is no need to embark on a program of responsibility for advice concerning investments, but the opportunity exists for the utilities to build warm business friendships with customer and employee owners during this transition period in security values. Certainly the utilities should be careful not to do anything that will tend to destroy the spirit of good will engendered in the past by their intelligent handling of the customer-ownership plan.

Twenty-five Years of Accomplishment in New Jersey

IT IS no mere flower of speech to say that New Jersey is a diamond mine richer than Kimberley. Comparatively speaking, the state has just begun to grow. In the near future a vast community will exist between the Hudson and the Delaware Rivers. These natural barriers have only recently yielded to the work of man in tunnels and bridges of which the present evidences are merely the beginning. All this means obligation for the Public Service Corporation of New Jersey and its personnel, but that corporation, through its officials, is fully conscious of the responsibility imposed by the growth of the territory served.

As Owen D. Young said at the dinner to President McCarter which marked the high point in the celebration of the 25th anniversary of the founding of the corporation, in imagination is the leadership of the world. The founder of the New Jersey company certainly had imagination. But a corporation can be no more articulate than is its personnel, and it is the accomplishment of the Public Service personnel, from the president down, that marks the corporation as worthy of the trust a whole state has reposed in it. Among the many things which illustrate this is the loyalty of all the employees, best evidenced perhaps by the 750 of all ranks eligible for the 10 per cent salary bonus which Mr. McCarter himself announced as a slight token of appreciation to all employees who have been with the company since its inception.

There have been trials and tribulations in New Jersey, many of them, but through prosperity and adversity the officers and employees have been dominated by the purpose to make the vision of the founder of the company a reality. That is a never-ending task, since the vision of the founder is a vision that constantly sees ahead. As tangible evidence of that vision there is the $293,000,000 expended by the corporation on its system since the company was founded in 1903. But even that amount will seem small by comparison with the sum that will undoubtedly go into the property in the next 25 years.

In the past the transportation problem has caused the company concern, but with the co-ordination of trolley, bus and de luxe bus on a statewide scale and the more recently indicated disposition even to go into the taxicab business, the solution of that problem appears to be at hand. The New Jersey company is a striking instance of the fact that public utilities have assumed a place in the social structure second in importance only to that of the government. That the officers and the rank and file of the Public Service Corporation recognize fully that the interdependence of the people and the utilities becomes greater as the extent of the service grows and its uses multiply is proved by the record of their accomplishment.

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Opinions Differed in Key System Fare Case

JUST how much nearer is a solution of the fare problem on the Key System Transit Company than it was last fall remains to be seen. An advance has been allowed in commutation rates, but the so-called local fares have been kept by the commission at 7 cents, and the single-trip ferry fare at 21 cents. The plea of the company was for a 10-cent local fare and a 25-cent single ferry fare. Apparently the commissioners were reluctant to throw an added burden on ferry riders and they appear to have agreed that the company would not benefit by a 10-cent local fare. In fact, one of the commissioners expressed the opinion that the company would probably have been better off had it retained the 6-cent fare, since there were more than 4,000,000 fewer riders in the first seven months after the increase to 7 cents. This very result appears to have been the determining factor in the recommendation of the commission last November that the company experiment with a 5-cent zone plan. To this proposal the company demurred. Coupled with the suggestion of the commission at that time was a 10-cent cash fare, a $1 weekly pass, and an off-peak 5-cent cash fare between the hours of 9 a.m. and 4:30 p.m. A $1.50 weekly pass good in two or three zones also was part of this plan. The disposition of the commission in its latest ruling was to criticize the company for its unwillingness to adopt the experimental fare suggested by the commission.

It must, of course, be acknowledged that fare experiments are fraught with danger, particularly since the opportunity for the carrier to recoup any losses is always so remote. On the other hand, it would be priceless to know in any particular situation just what had better be done. And that cannot be determined without recourse to experiment. According to Mr. Swaine's article elsewhere in this issue, fare is not the chief factor affecting travel. Even the doctors disagreed in the recent Key System case. As one of the commissioners put the matter, "competition and economic conditions have become far more potent than the order of any regulatory body such as the Railroad Commission." The further point made by one of the commissioners also is admissible, that to a very large extent the riding public, by its disposition to use or reject service, fixes and determines the rate of fare. Certainly the variety of the service rendered by the company and the disposition of the residents of the territory to constitute themselves into units tend to complicate the situation on the Key System.

Widening Horizons

WHEN a group of railway accountants held a committee meeting the other day in a central western city it presaged little out of the ordinary. It was supposedly just one of the necessary business sessions devoted to preparing a program for a forthcoming convention.

With their immediate business dispatched promptly, these men chose to linger for discussion; chose to abandon for the moment consideration of matters strictly within their profession and to view instead the broad problems of the transportation industry in which they were engaged. And as sometimes happens when men pause to take stock of themselves and of their immediate activities, this group soon became inspired with the idea that they might be of greatest usefulness to the industry by disregarding for the nonce the details of their profession and devoting themselves to a search for new and untried methods of securing business for their companies.

While several very promising ideas were born of that meeting and arrangements are already under way to adopt at least one of them, the outstanding thing remains that these men gained a broader vision of the part they might play in improving the affairs of their companies. Beyond the existing boundaries of their present program of work they envisioned a broadening horizon of usefulness for the accountant through the application of accounting experience to the outstanding problem of the industry—that of building revenue in the face of a constantly increasing swarm of private automobiles. Let us hope that other groups in the industry will take it upon themselves to match these accountants in spirit and viewpoint.

Successful Selling Requires a Constant Search for Buyers

WHEN electric railways undertake to employ advertising for the several purposes to which it may be adapted, they accept the obligation to produce as advertised. Although the ride, whether by car or bus, is a salable product, its character varies widely on different properties. Advertising becomes impotent when its promise outreaches performance. Nor can advertising used to inform the public regarding transportation matters be expected to work miracles in changing public opinion overnight on a question in controversy.

Advertising, to be effective, must be sincere and it must stay within the facts. When used to sell a product it puts upon management and employees the obligation to produce as advertised. When employed to disseminate information, ample time must be allowed for the public to absorb the message; the various facts of the railway story must be told and retold, regularly and persistently.

Speaking before the Illinois Electric Railway Association several weeks ago, E. E. Soules, publicity manager Illinois Power & Light Corporation, said that the modern manager has learned that it is futile to rush into print and to expect the public to join in the mourning after his company is in trouble. Co-operation and understanding can be expected only if he has been telling the public all along his hopes and ideals and the facts of his business.

In this merchandising age electric railways, like other industries, must recognize that the advertising specialist can do his work effectively only when given the opportunity to plan a consistent campaign over a period of years. It is true that advertising tends to bring about improvement of the product. It does so through the effect the promise of good service has upon the attitude of the company's own employees. But, to repeat, the promise must not over-reach the actual performance —otherwise the advertising becomes not only dishonest but ridiculous as well.

Granted a really worth-while product, the creation of new customers is dependent on constant and compelling reiteration. The qualities of the Gold Dust Twins or Palmolive Soap are well known only because they have been far more than twice-told tales. The same principles apply in the merchandising of railway rides. The search for buyers must be constant, consistent and cumulative.

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Graphs Assist in Lowering Costs and Improving Service

North Shore management uses charts to study work of its several departments. Merchandise handled, wages, passenger service delays, equipment costs and energy consumption are some of the items charted

By J. R. Blackhall

General Manager Chicago, North Shore & Milwaukee Railroad, Highwood, Ill.

EXTENSIVE use of graphs is made by the Chicago, North Shore & Milwaukee Railroad, Highwood, Ill., to check the work of its several departments and the activities of the company as a whole. Their use has enabled the management to analyze the regular reports more closely, with the result that many economies have been effected and several service improvements made.

In the merchandising dispatch department the tonnage has been increased, station labor reduced, more efficient methods of handling adopted, the cost per ton for handling reduced and the general movement of freight accelerated. In addition, tables showing the causes of damage to commodities and the kind of commodities for which claims were entered, have enabled the company to reduce its total amount of claims an appreciable amount. Passenger train delays have been reduced to a minimum and revenue built up because of the improved service. Electrical energy has been saved not only on the short runs but also on the long runs of both the passenger and freight trains. Other accounts also have been reduced and budgets have been planned more closely. In many other ways the charts have aided in effecting economies.

Figures for plotting the graphs are secured from regular reports submitted by the department heads and from the records of the company. These graphs, especially those dealing with budget control, are presented to the budget and expense committee, which meets every second Tuesday. Here, before all the department heads, the general manager reads from the tables and graphs the record, by accounts, of each department for the month and the period to date.

Any account showing an unexpected fluctuation is questioned and if the department head cannot at once explain this, he finds and reports later the reason for the deviation from the budget. After a careful analysis by this committee the information is distributed among the department chiefs or used to illustrate talks given before the superintendents as a group. Department heads, in turn, use them in talking before their supervisors and foremen. Many phases of the work, such as freight handling, train delays, passenger revenue and energy consumption, are discussed before the groups at regular intervals.

Numerous forms of charts are prepared to illustrate the data. Among these are straight line graphs, horizontal straight line graphs, tables and ledger sheets with colored squares to indicate important figures, as amounts

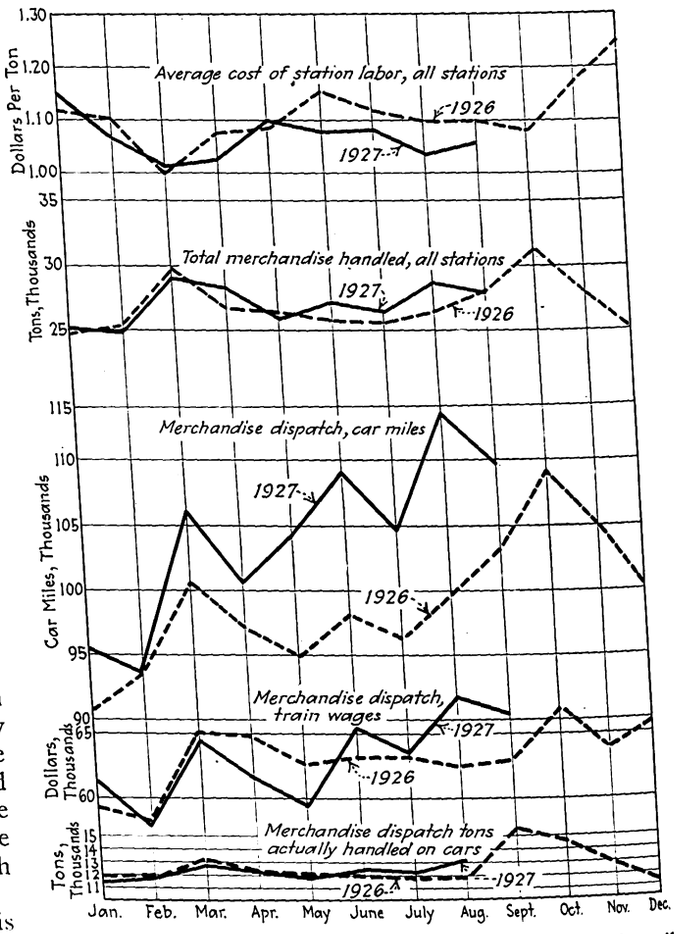

Fig. 1—Curves showing total tons of merchandise handled at all stations of the system, average cost per ton for station labor, merchandise dispatch car-miles and train wages

overspent and cars used in excess. Combinations of other conventional forms are used for special illustrations. Some of the graphs compare actual figures for a certain year with those of the preceding year, while others compare the data by months. Still others present the actual amounts with the budgeted amounts for a definite period. Separate graphs are plotted for the individual items of certain accounts, permitting a more thorough analysis.

Several charts are prepared each month showing the figures for the merchandise dispatch department. In addition to monthly comparisons of tonnage, cost per ton

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and the number of warehouse and office men employed, curves are plotted showing the figures for the past year and the year previous for total tons of merchandise handled at all stations, the tonnage handled at each station, the average cost per ton for station labor, train wages and the merchandise dispatch per mile. A typical group of merchandise curves is shown in Fig. 1. A similar group of charts is made up for each freight station of the system and these charts are used in meetings with the freight agents for the respective stations. Tables listing the claims by commodities and by causes are prepared and used also in meetings with the freight agents. These have proved very helpful in reducing the claims for the department. In the accompanying table is a typical classification of claims by causes.

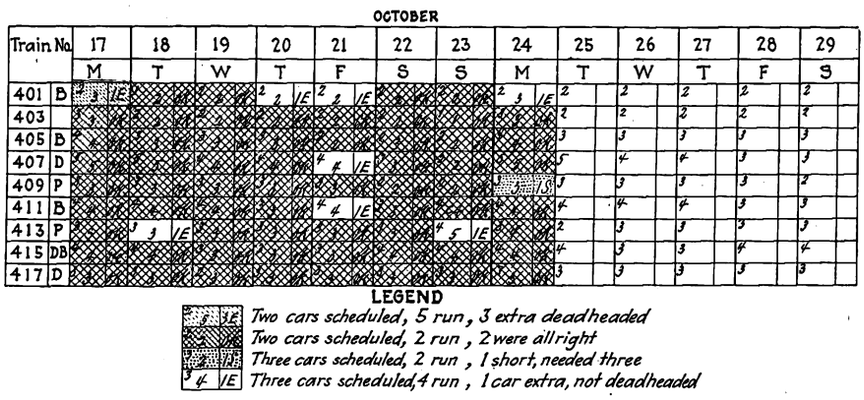

Fig. 2—Service check of nine trains for an eight-day period. The scheduled cars for five days in advance also are given

Train Scheduling Simplified by Service Checks

Service checks are made of all trains and the data plotted on charts for use in scheduling the trains on future runs. The system schedules an average of 360 trains of one to six cars through a densely-populated territory in which the traffic is different each day of the week. Because of these reasons it is a difficult task to assign the proper number of cars to the various trains. The company wishes to furnish sufficient cars to satisfy the customers, yet must not because of the excessive cost provide cars in excess of what are needed. Economical scheduling requires a uniformly distributed load on the trains, so the company makes very close checks of the trains in the following manner:

Every conductor prepares a traffic card, indicating the number of passengers on his train and listing the stations of the particular division on which he is serving. These traffic cards are turned in to the transportation department, where they are compiled and entered on a sheet giving the train number, the number of cars and the passengers at the various stations. A chart is prepared showing for each day of the month and for each train the number of cars scheduled for that particular run, the number actually run, the number that were dead-headed and whether the train as operated had enough or an excess of equipment. This chart also shows the number of cars the transportation department proposes to run for each train, the number being checked by data of previous runs. For example, if the company on Tuesday was deciding what number of cars to schedule for the coming Thursday, it would check back three Thursdays to see what equipment had been used and whether it was sufficient or not. Use of this method has saved the company a considerable number of car-miles in its interurban service.

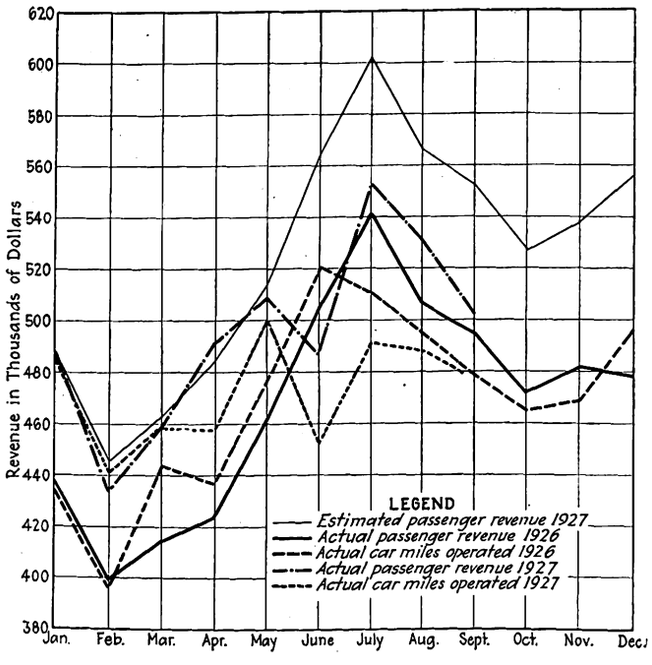

Fig. 3—Comparison of passenger revenue and car-miles for 1926 and 1927. Estimated passenger revenue for 1927 is plotted also

MERCHANDISE DISPATCH CLAIMS BY CAUSES, SHOWING AMOUNTS PAID FOR ALL STATIONS

	1927					
Causes	January	February	March	April	May	June
Rough handling	$177	$352	$150	$189	$134	$168
Concealed damage	196	126	327	244	158	66
Shortage entire package	98	195	149	128	159	137
Pilferage	8	..	2	9	..	2
Concealed loss	..	3	12	..	1	5
Freezing	2	23	..	..	..	..
Fire	..	..	..	..	..	..
Wreck	..	..	..	..	..	..
Damage by water	..	5	..	..	6	20
Unlocated loss	..	41	..	..	..	..
Delay	..	..	..	6	..	50
Improper loading	..	..	..	..	6	..
Improper refrigeration	..	9	..	..	..	5
Unlocated damage	..	..	57	..	15	19
Error in delivery	..	..	10	97	..	6
Total	$481	$754	$707	$673	$478	$480

Fig. 2 shows a train service check of nine trains for eight days and the number of cars scheduled for five days in advance. In addition to the car scheduling checks, passenger revenue and car-miles, both actual and estimated, are plotted. Figures, by months, for the past year and the year previous are used.

Much Has Been Done to Reduce Car Delays

Car delays have been reduced to a minimum on the North Shore by classified checks of the causes of delays and constant effort on the part of both management and employees to eliminate them. Each month a report is prepared which lists all delays for the period and gives the date, number of the train, the time lost and the cause for each delay. The delays are allocated to the following departments according to the responsibility for their occurrence: Trolley, equipment, transportation, power and way. Copies of the monthly reports are furnished to all supervisors and the delays are discussed at their meetings. Because the delays are charged to the various

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	EQUIPMENT	JAN.	FEB.	MAR.	APR.	MAY
	29 Superintendence of Equipment					
Legend	2901 Salaries	137	23	471	457	147
	2902 Supplies and Expenses		22	6	18	77
Amounts overspent, shaded.	30 Passenger and Combination Cars					
	3001 Painting and Varnishing	2043	1797	1714	1627	1607
More than $500 909	3002 Car Bodies	560	18	352	567	227
	3003 Draw Bars and Draft Rigging	469	0	176	169	437
Less than $500 145	3004 Trucks	2031	1294	747	1512	119
	3005 Brake Shoes	20	38	113	750	17
Amounts underspent, unshaded.	3006 Air Brake Equipment	12	52	245	10	83
	3007 Air Compressors and Governors	19	42	11	20	1
	3008 Heaters	116	34	65	172	111
	3009 Repairs Due to Accidents	2856	1058	185	758	731
	3010 Wiring, except for Electrical Equipment of Cars	79	143	439	120	15
	3011 Wheels and Axles	909	280	853	1370	587
	31 Freight, Express and Mail Cars					
	3101 Express Cars	21	558	433	1156	81
	3102 Freight and Mail Cars	392	847	164	159	142
	37 Shop Expense					
	3701 Heating and Lighting Shops	312	188	412	106	210
	3702 Misc. Supplies and Expenses, incl. small hand tools, etc.	209	214	66	1	26
	Actual Expenses - No Depreciation	36173	35320	31616	30321	32479
	Budget Allowed - Depreciation Deducted	34220	34220	33170	32220	31920
	Difference in actual and budgeted amounts for total equipment	1953	1100	1554	1989	559

Fig. 4—Section of an equipment account showing for five months the amounts under-spent and over-spent for each particular item

departments, a rivalry exists among them and every employee makes an effort to keep down the delays in his department.

Closer and more accurate budgeting is made possible by using budget control sheets. One of the sheets prepared for equipment is shown in part as Fig. 4. The complete sheet gives the amount that each individual account was over-expended or under-expended with respect to the budget. Similar sheets are kept for power, conducting transportation, way and structures, traffic, advertising and miscellaneous. The equipment report shows that the mechanical department was able to perform its work with little more than the amount allowed it on the budget. Those directly responsible for the work of the departments, the various supervisors and foremen, are conferred with in regard to the charts, so that these men as well as the management know the costs. This results in a much better esprit de corps among the men at all times.

Checks are made of energy consumption on every branch of service of the company, and the data on a kilowatt-hour per car-mile basis plotted on charts. Because of the extremely high speed of the trains and the rigid schedules, a number of the motormen did not consider it possible to effect any energy saving. However, the preparation of charts showing the energy consumed and the further instruction of motormen who were careless and unmindful, resulted in huge savings. During the nine months in 1927 from January to September, inclusive, the kilowatt-hours per car-mile were reduced from 2.92 to 2.63. Additional charts are kept which record the performance of each motorman in the various classes of service. This information is furnished the division superintendents and the power inspector, so that an immediate check can be made of each individual motorman. If a motorman is using more than the average, he is given additional instruction in energy saving. Some of the motormen who previously have operated their trains economically become lax and waste energy. The system enables the inspectors to check these men also.

Only a few of the large number of charts used successfully by the company have been described. Others are playing equally as important parts in lowering operating costs and improving the company's service to the public.

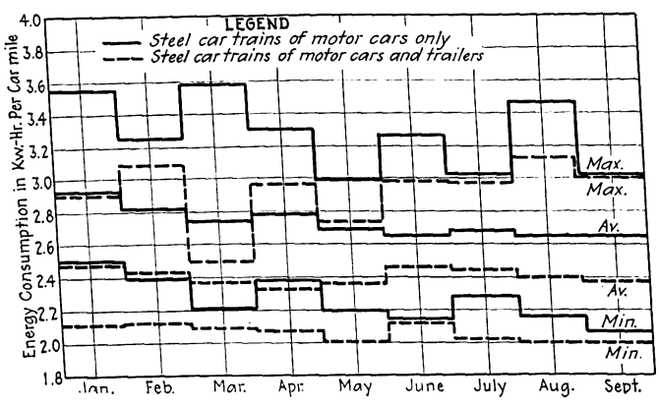

Fig. 5—Maximum, minimum and average kilowatt-hours per car-mile for steel car trains composed of motor cars and for trains of motor cars and trailers in Milwaukee limited service

Electrically Welded Car Bodies and Trucks

SUCCESS following the substitution of electric welding for rivets in building construction, has suggested to some European electric railway managers that electric welding might be used to advantage to car body and truck construction. The Liége Consolidated Tramway has actually built a car in which the members of the steel framework were joined by welding rather than by rivets. The saving in weight is estimated as between 9 and 10 per cent. The reduction in energy consumption thus gained is not the only advantage, in the opinion of the company, as there is thought to be also a saving in car maintenance and also a reduction in noise. The use of the same system for car body construction is proposed by the Turin Tramways, and the Lausanne Tramways has built truck frames by the same system.

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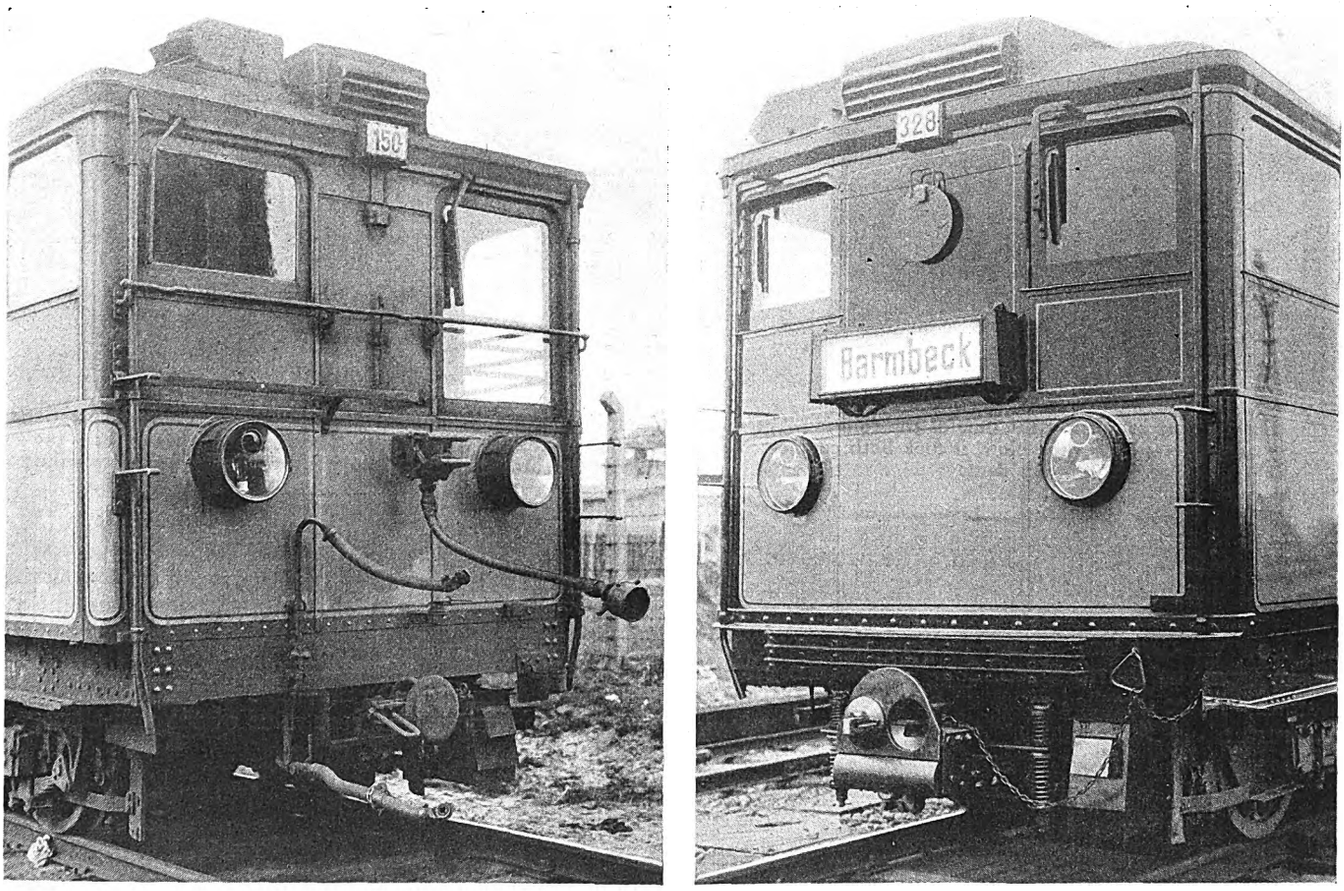
What Happens to an Anti-Climber

In a severe collision between two trains in a station on the Hamburg Elevated Railway, the anti-climber on one car was bent and a coupler support broke. Otherwise, the damage was slight and there was no overriding of one car by the other

By Dr. W. Mattersdorf
Manager Elevated Division Hamburg Elevated Railway, Hamburg, Germany



At left, end of Hamburg elevated car before addition of automatic coupling and anti-climber. At right, after their addition

CARS of the Hamburg elevated railway were equipped last year with an automatic universal coupler and also with an anti-climber, consisting of horizontal projecting ribs. The first two illustrations show the front of the car before and after this remodeling. The new coupler served very well during normal operation, but until recently experience as to how it would behave during a wreck was lacking. A collision which occurred on March 30 of this year, however, has now provided remarkable testimony of the excellent properties of this equipment.

The collision occurred at the Brückenstrasse station on the Elevated line, and its cause was that the station attendant by mistake gave a clear signal for the entrance into the station, although the train ahead was still standing there. Consequently the second train entered and hit the solidly braked train ahead of it at the considerable speed of 30 km. (19 miles) per hour. The effect of the impact upon the standing train was great. In fact, it was pushed bodily along the tracks, while the incoming train, losing its inertia, stopped almost immediately after giving its blow. Before the second train stopped the distance between it and the colliding train was 8 m. (26 ft.). The following describes what happened during the collision.

The colliding trains coupled automatically without damage to the couplers. This provided a rigid connection between the two trains and, with the anti-climber, helped to keep the platform of the first car of the incoming train from climbing over the platform of the rear car of the stationary train. However, the draft gear guide directly behind the coupler head of the incoming train broke, causing the coupler to drop down. It hung onto the struck car, as shown in the third illus-

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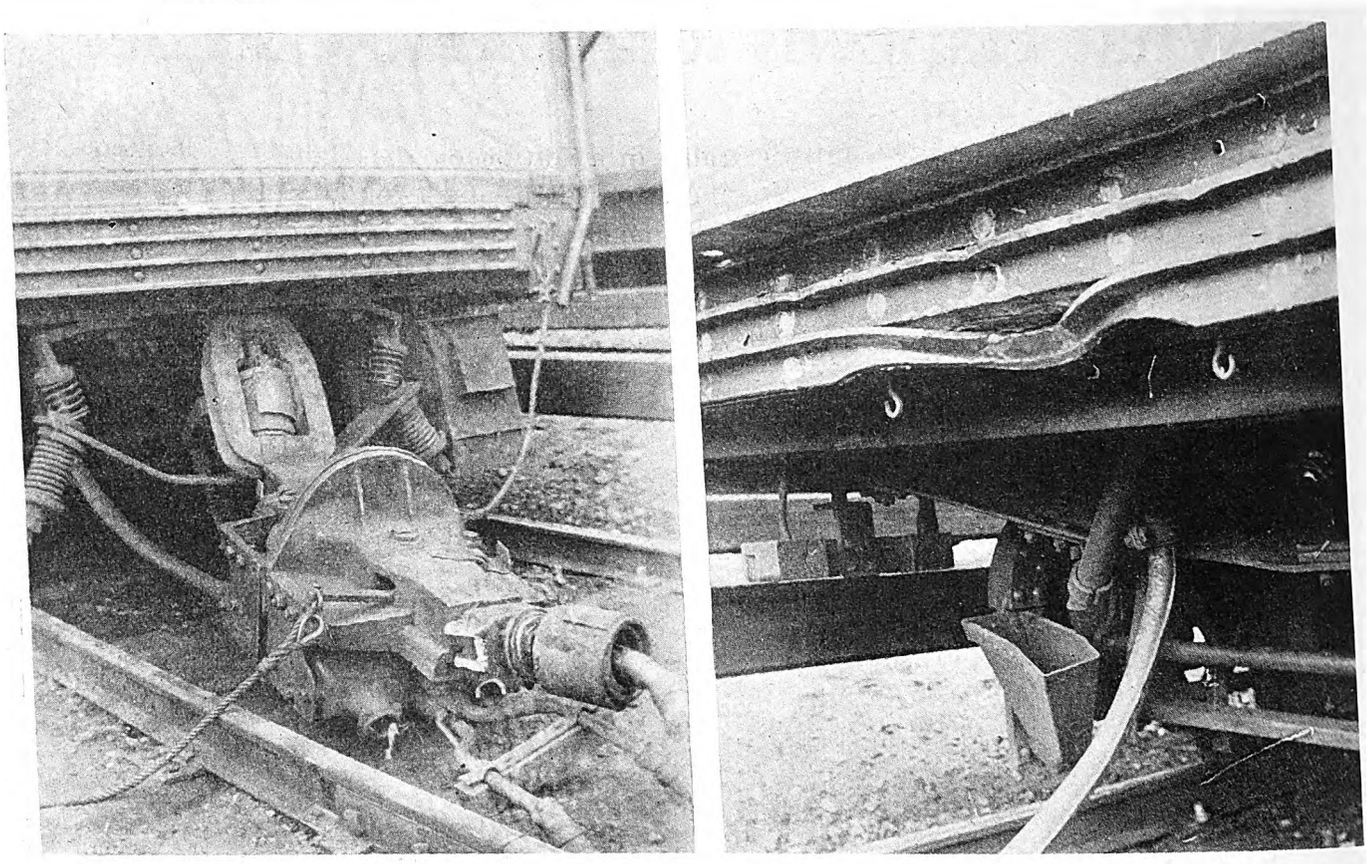
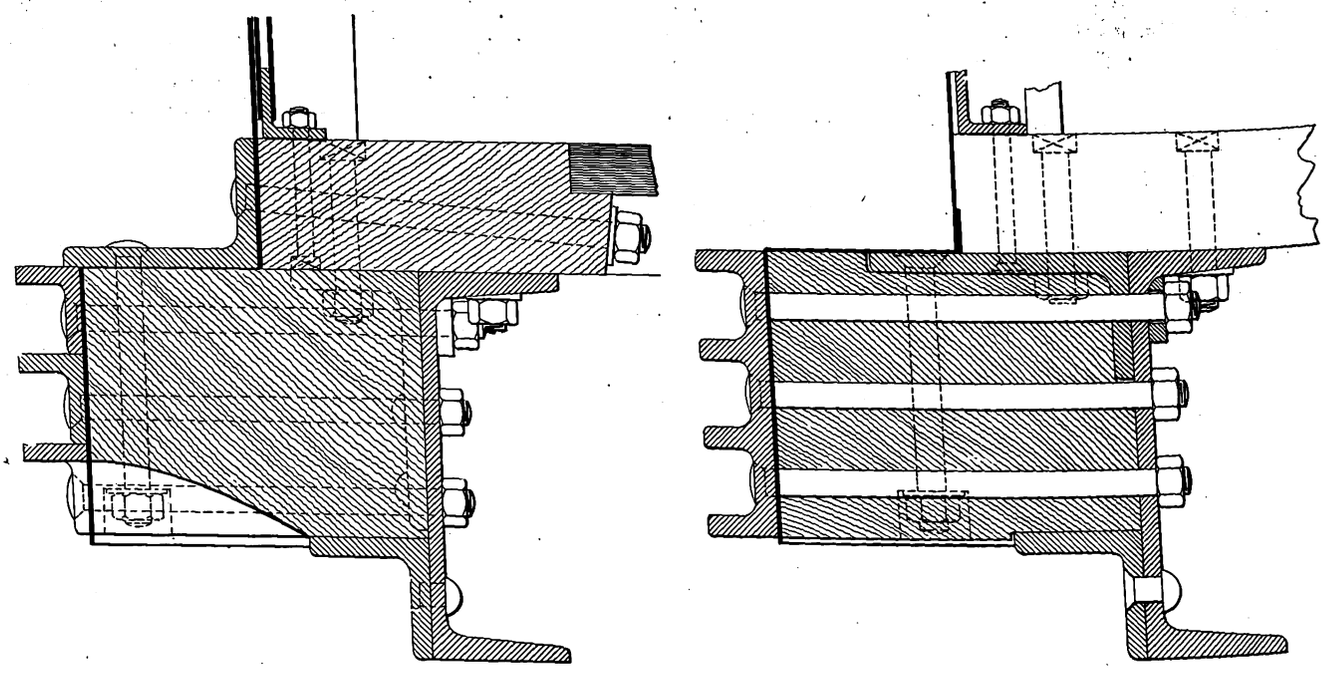


The cars became coupled at the time of the collision, but the impact broke the coupler support of the colliding car. As the stationary car went forward from the blow, it took both couplers with it, as shown in the left-hand view. The right-hand view shows the end of the colliding car with the damage done to the anti-climber. Except for broken glass, there was practically no other injury to the cars

tration, falling upon the roadbed. The two colliding cars were undamaged, aside from broken glass panes from the heavy shock.

How well the anti-climber took up the shock can be seen from the fourth illustration. It was the first type of this device installed made up of three angle irons, as illustrated in the first line drawing. From the view given of the anti-climber after the collision, it is evident that the round faces of the coupler heads bent down the lower angle iron and that the rivet heads fastening the angle irons on the stationary car left their marks on the horizontal rib of the oncoming car.

This accident, for the first time on the Hamburg system, demonstrated the great value of the anti-climber in



Anti-climbers in Hamburg were formerly built up from several angles (see left-hand section). Now they are made in one piece, as shown at the right

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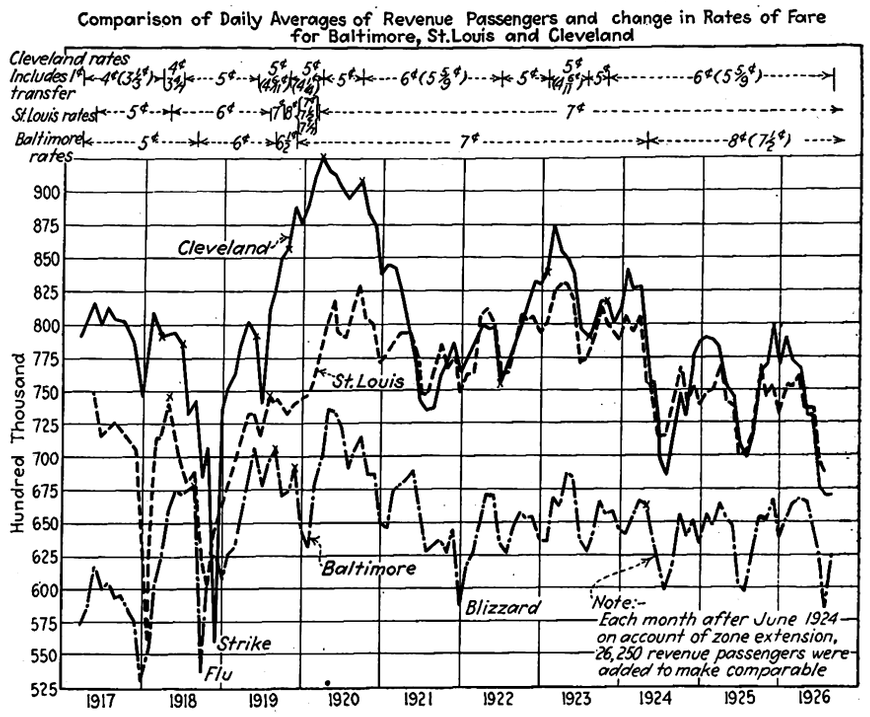
a serious collision. When it is considered that telescoping of the cars causes most of the injuries, the safety afforded by the anti-climber in such accidents cannot be too highly stressed.

In the latest anti-climber used on the Hamburg Elevated division, the ribbing no longer is provided by riveting angle irons together, but the anti-climber is rolled in one piece, as shown in the second line drawing. How slight the damage was to the cars is best indicated by the statement that both trains proceeded to the repair shop under their own power. Since the electric coupling cables between the cars were ruptured, it was, of course, first necessary to make the needed electrical reconnections.

A detailed account of the coupling with which the cars are equipped was published in the issue of ELECTRIC RAILWAY JOURNAL for Sept. 10, 1927, page 435. It was patterned after one of a somewhat similar type used by the Philadelphia elevated railway but is of somewhat lighter design.

The mechanical and pneumatic parts were supplied by the Scharfenberg-Kupp'ung, A.G., and the electrical parts by the railway department of the Allgemeine Electricitäts Gesellschaft of Berlin.



Daily averages of revenue passengers compared for Baltimore, St. Louis and Cleveland

It will be noticed that from 1920, on the right hand side of the chart, there is a striking similarity in the graphs of the three properties. During the period shown there was no change in fare in St. Louis, but there were a number of changes in fare on each of the other two properties.

Has The Economic Limit in Car Fare Been Reached?

Records by months since 1920 of passengers carried in Baltimore, Cleveland, Brooklyn, Pittsburgh, St. Louis and Boston show no definite connection between changes in traffic and changes in fares, and indicate that a charge of 10 cents a ride is not the economic limit in street railway fares

BY JAMES W. SWAINE
Statistician United Railways & Electric Company, Baltimore, Md.

SOMETIMES it is claimed that the economic limit in car fares is reached when a fare of 7½ cents is charged, and that any higher rate will greatly discourage travel. This assertion is made without due consideration of all of the facts. To determine them, the writer has compiled the accompanying charts to find what effect, if any, changes in fares have had on the riding habits in several cities where a number of fare changes have been made.

The problem is admittedly not the same in small cities as in large cities. As information was wanted for cities about the size of Baltimore, those cities selected for comparison with it were Boston, Brooklyn, Cleveland, Pittsburgh and St. Louis. In these cities the present rates of car fare vary from 5 cents flat to 10 cents flat.

The chart on page 936 shows the number of passengers carried during December for several years by the electric railways in the cities named, together with the dates of the changes in fares on those properties. The second chart shows similar data for the month of August.

In the first chart it will be seen that in Boston, where a 10-cent flat fare is in effect (except on a few local lines, on which the fare in 1921 was 5 cents and is now 6½ cents), there has been a constant increase in revenue passengers carried since 1919 except in one year. In the other cities whose records are charted, varying figures for passengers carried are shown, but in general the traffic is somewhat more than in 1917 and has been fairly constant since 1920. The fact stands out clearly, however, that the variations in passengers carried bear little, if any, relation to the changes in fares.

Attention will now be directed to the second chart of passengers carried during the same years but in the month of August. Here the trend since 1920, in all cities except Boston, has been steadily downward. It will also be seen that this chart, like the other, shows the striking fact that this trend has occurred irrespective of the changes in fares, whether they have been up or down. Thus in both charts, the line for Brooklyn, (Brooklyn City Railroad) has about the same direction as those for Baltimore, Cleveland, Pittsburgh and St. Louis, although in Brooklyn the fares were kept at 5 cents flat, whereas the fares in the other cities were increased. The one exception in both of these charts is Boston, the one city of the six charging a 10 cent flat fare. Here revenue passengers have steadily increased during the winter months ever since the 10 cent flat fare was inaugurated, and the summer months have held their own.

REASONS FOR LESS TRAFFIC IN THE SUMMER

The reasons for this falling off of traffic in the summer time as compared with winter must be sought in other causes than changes in fares, as the trend is so

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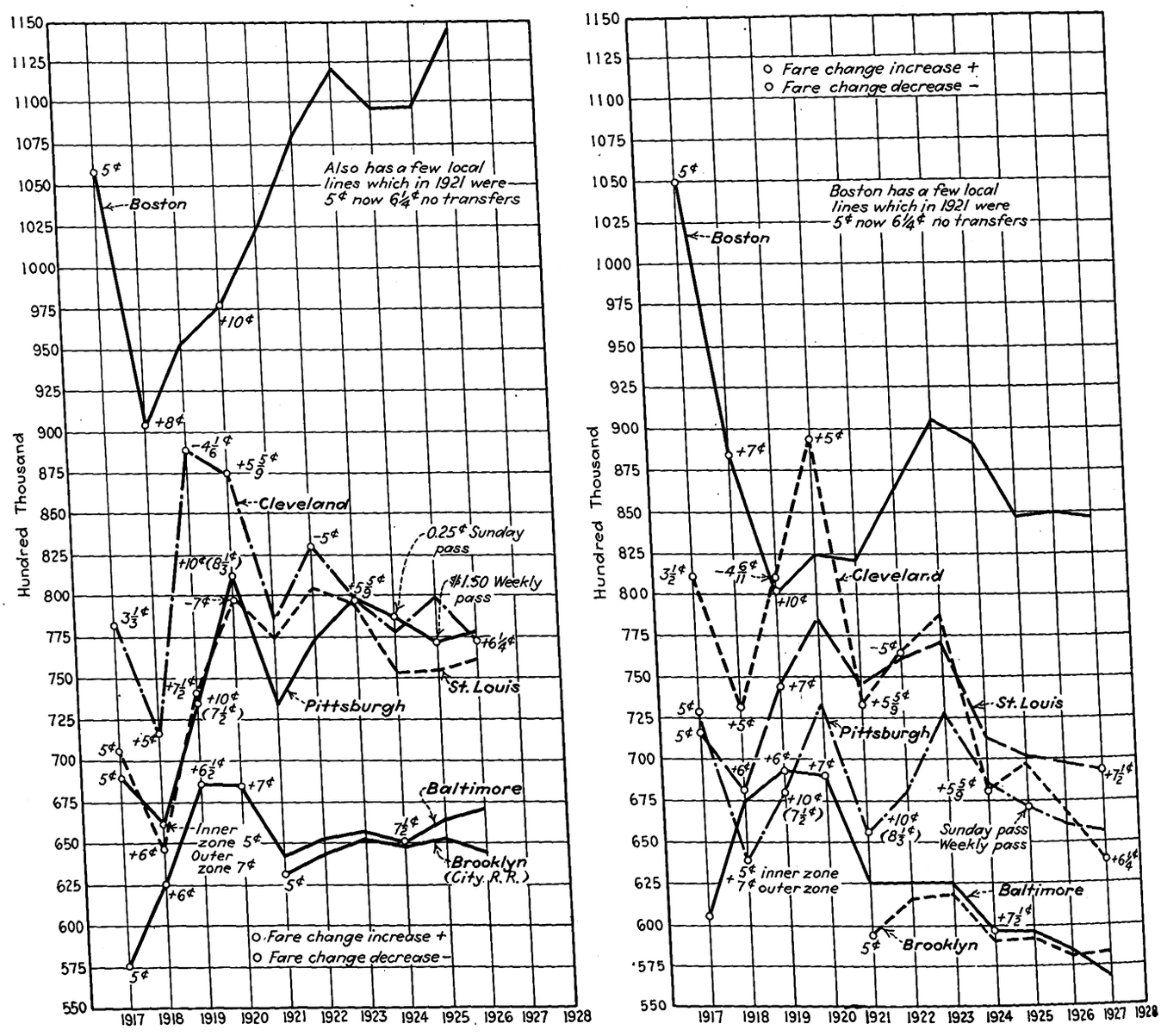

These charts show the daily average of revenue passengers during a typical winter and a typical summer month in five American cities of approximately the same size. The chart at the left is for the month of December for eleven years; that at the right is for the month of August during the same years

uniform and general. The chief reason is undoubtedly the growth of automobile riding, which has brought about a substitution of the automobile for the street car, especially in the summer, whereas during the inclement days in the winter, automobiles are more likely to remain in the garage. This same theory probably explains the marked difference in trend for winter travel in Boston, as compared with the other five cities. The cold winters with their heavy snows in the narrow streets of that city undoubtedly discourage winter automobile travel to a greater extent than in any of the other five cities mentioned.

Another cause for the falling off of travel in summer, though probably of less importance than the influence of the automobile, is the growing tendency in summer for stores and offices to suspend work on all or part of Saturday. This custom permits many people to make week-end trips from Friday night or Saturday noon to Monday morning and takes out of the city many who would otherwise patronize the street railway. In Baltimore, for example, where the figures are available, while week-day riding during the summer has remained fairly constant, heavy losses have occurred in revenue passengers on Saturdays and Sundays.

To resume, then, these charts indicate that fares as high as 10 cents flat are not responsible for losses in revenue passengers. For this reason it cannot fairly be said that a flat rate of 10 cents even approaches the economic fare limit.

Monthly Records from Three Cities

The chart reproduced on page 935 compares the daily averages of revenue passengers (with change in rates of fare) for Cleveland, St. Louis, and Baltimore, from 1917 to the middle of 1926. It will be noted that the fluctuations in almost every case occur independently of a change in the rate of fare. This is particularly striking, as St. Louis had no change in fare from early in 1920 to the end of the chart, yet its trend is almost identical with Cleveland and very similar to Baltimore. Both of these two cities had fare changes during the period shown in the chart.

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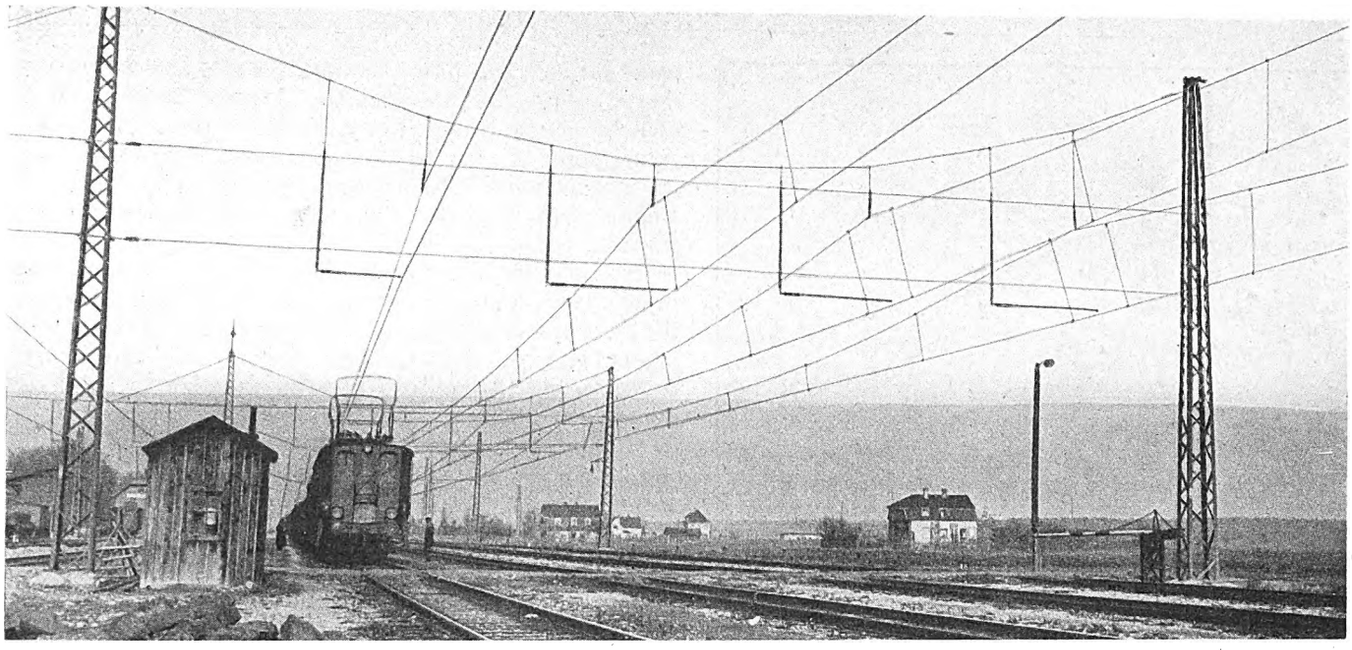

Latest type yard construction in Bavaria, with simple insulation, grounded cross-spans and track isolation

Many German Railroads Are Electrified

Expansion of electric lines has been steady. Distribution systems, locomotives and other equipment differ on various units of the German Federal Railroad

By Kent T. Healy
Research Associate Yale University, New Haven, Conn.

PROGRESS in the electrification of the German main-line railroads has been rapid since the formation of the new operating company pursuant to the reorganization of railroads in that country under the Dawes plan. The mileage of electrified track has gone up from 382 in 1924 to 773 at the end of 1927. More than that, there are 201 additional miles of track on which the installation of electrical equipment is under way at present. The number of electric locomotives went up from 114 in the earlier year to 316 at the close of the last year, and 98 more locomotives are on order. Corresponding increases in multiple-unit cars have been made. From 1924 to 1926 the ton-miles hauled went up from 1,236,000,000 to 4,000,000,000, an increase of 225 per cent. More complete figures are given in an accompanying table.

The change in the situation is the more marked in that electrification of the German railroads was begun many years ago. The first installation was in 1903, when two suburban lines in the Berlin district were equipped, one for direct current and the other for single-phase alternating current. The latter was installed for experimental purposes, but was followed with a commercial single-phase road in 1907, when the Hamburg suburban lines were equipped with this system utilizing 3,300 volts at 25 cycles.

In 1910 the heavy traffic lines north of Leipzig were electrified, also for single-phase alternating current but at a pressure of 15,000 volts and a frequency of 16⅔ cycles. The Mittenwald Railroad on the Austrian frontier was constructed for electric operation in 1913. This served as the beginning of the Bavarian electrification, which has become the largest unit in Germany. The lines in the mountainous territory in Silesia, equipped for electric operation in 1919, have become the second largest group. Electrification of all the suburban lines out of Berlin was started in 1924, when a preliminary line to Oranienburg was equipped with a third-rail system for 800 volts direct current. The electrification of the Berlin lines is the outstanding feature of the German Federal Railroad Company's electric traction program at the present time. Articles appearing in the Nov. 5 and Nov. 26, 1927, issues of this paper described in detail the Berlin electrification and the cars to be used on the line.

In general, the policy of the various railroad units

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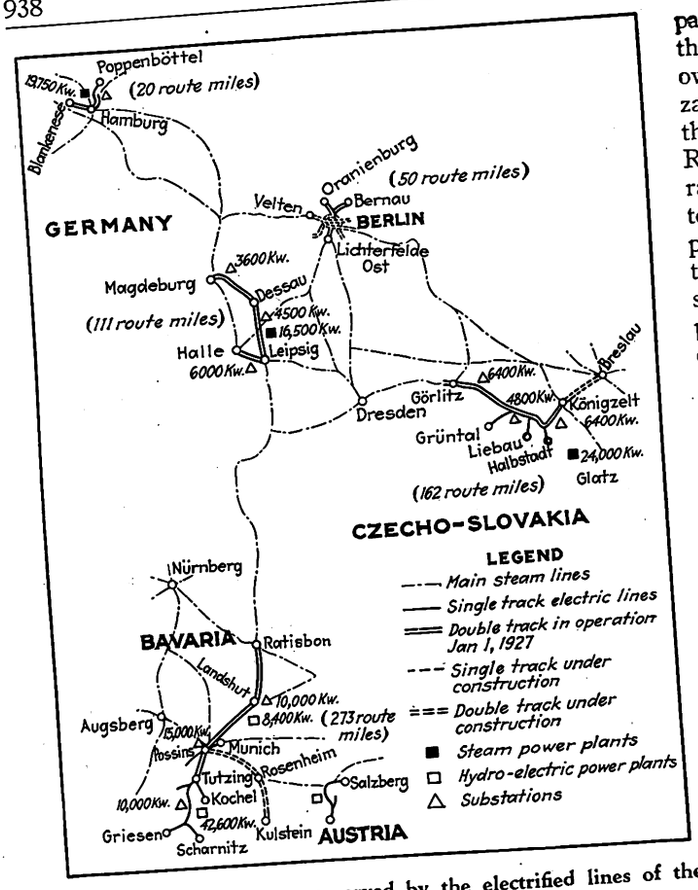


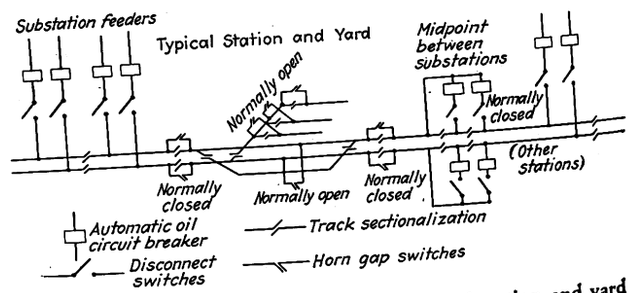
Five principal regions are served by the electrified lines of the German Federal Railroad Company

has been to generate their electrical energy individually, rather than to buy from independent power companies. The power plant which supplied the Silesian group was first privately owned, but the arrangement proved so unsatisfactory that it was later purchased by the railroad company. Proponents of the two plans again advanced arguments when the decision to electrify the Berlin suburban lines was made. The situation was particularly tense, since three-phase current at commercial frequencies was to be used for transmission instead of the single-phase, low-frequency system adopted on the trunk lines. The railroad company argued that it would be cheaper to produce the electrical energy than to buy it, that the company did not wish to be electrically connected with a net that would spread the damage of other failures to its own service, and that it seemed better from an organization point of view to have so important an element in the production of transportation under its own wing. Representatives of the power companies replied that the railroad was not fairly nor soundly figuring its costs as to freight and depreciation, that modern switching and protective equipment prevented the spread of failures in the network, and that the advantage of several power sources was considerable. Only recently, and after much pressure, did the railroad give up the plan to build its own power plant.

Most of the power plants are steam operated. Both the Silesian and Leipzig plants are in coal fields, the former using hard coal and the latter the so-called brown coal. The Bavarian group is supplied by energy from one main hydro-electric plant at the headwaters of the Isar River and several smaller plants lower down on the same river. Coal is expensive in this region, so that a considerable saving is being effected in the use of water power.

Substations Chiefly of Indoor Type

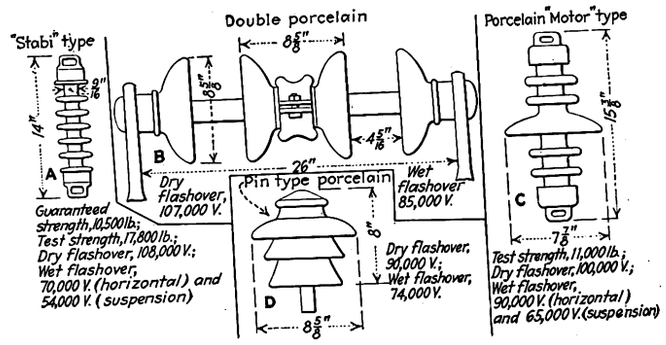
Electrical energy for the railroad is transmitted at potentials varying from 60 kv. to 100 kv. All lines are designed for single-phase a.c. at low frequency, so that no phase or frequency conversion is necessary at the substations, which supply an unusually large area, causing high load factors. In the Leipzig section the substations are from 3,600 to 6,000 kva. capacity, each supplying approximately 37 route-miles. In the Silesian section the capacity of two substations is 6,400 kva. and of a third 4,800 kva. with an average mileage of 54 for each. Three substations, two with 10,000 kva. capacity and one with 15,000 kva. capacity, supply 273 miles of road in the Bavarian territory, an average of 91 miles each.



Distribution of switching system for a typical station and yard

Most of these substations are of the indoor type. The high-tension switching arrangement is standard, though the switches themselves open through resistances incorporated in the tanks. The transformers are placed in isolated compartments with frail doors, a safety measure in case of blowouts. The transformers are rated at 130 per cent load for two hours, 150 per cent for 30 minutes, and 200 per cent for ten minutes. The impedance permits about 9 per cent normal voltage on short circuit.

The 15-kv. switching in the modern substations is handled by resistance breakers, with a rupturing capacity of 200,000 kva. in each feeder circuit. These open on overload with a definite time limit. They are connected to either of two buses by disconnect switches. In conjunction with these buses is a high resistance that can be connected between either bus and the full voltage terminal of the transformers, so that a given feeder can be ener-



Four types of insulators for 15 kv. overhead construction

A: *"Stabi" type*—Guaranteed strength, 10,500 lb.; test strength, 17,800 lb.; dry flashover, 108,000 volts; wet flashover, 70,000 volts (horizontal), and 54,000 volts (suspension).
B: *Double porcelain*—Dry flashover, 107,000 volts; wet flashover, 85,000 volts.
C: *Porcelain "motor" type*—Test strength, 11,000 lb.; dry flashover, 100,000 volts; wet flashover, 90,000 volts (horizontal) and 65,000 volts (suspension).
D: *Pin type porcelain*—Dry flashover, 90,000 volts; wet flashover, 74,000 volts.

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gized at full voltage from the spare bus with a minimum of 10 amp. flowing. This is used for testing a given circuit, having the advantage that full potential is applied at the fault with a low current that is not destructive.

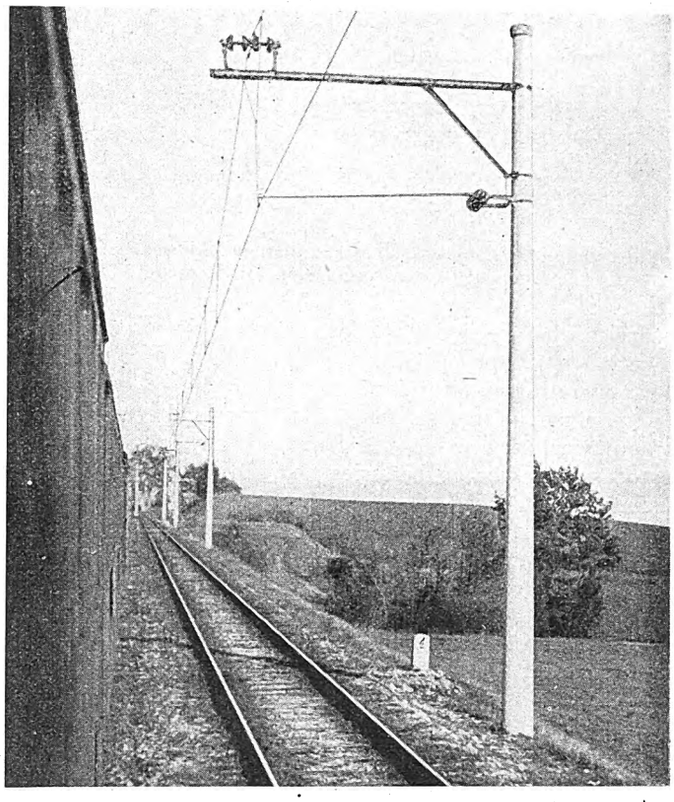
For over-voltage protection fairly satisfactory results are obtained by a sphere gap to ground, shunted by an oil switch and resistance, which automatically shorts the gap when it discharges. The switch immediately opens following the discharge.

Bavarian Distribution System Has Notable Features

The distribution system of the most recent electrification in Bavaria is of particular interest because of its effectiveness in isolating faults, its simplicity and its low cost. Each main-line track is fed separately from the substations at both ends through oil circuit breakers. Midway between the two substations is another automatic oil switch separating the two halves. This switch is normally closed, but it opens instantaneously on about 350 amp. overload. It thus divides the track section in halves, allowing operation on the unaffected portion to continue with energy from the corresponding substation. This intermediate oil switch is also arranged to close automatically if the voltages on the two sides are in proper phase relation. The main-line tracks are sectionalized at all stations with motor or manually-operated horn-gap switches. There are ties between tracks which are normally open. Sidings and yards are fed off either track through other horn-gap switches which are kept open when the tracks are not in use.

This distribution system is under the control of the substation operators in the districts. With the opening of a breaker on a feeder, the circuit is first tested through the current limiting resistance. If 8 to 10 amp. flows there is a serious short on the line, not merely a flashover. The operator gets in touch with the station-masters and signal men who operate the various sectionalizing switches, and asks them to cut off the track section by section, starting from the point where the middle breaker has sectionalized the line. As each section is cut off a test is made with the low current circuit, and if it does not show clear other sections are opened in turn until the faulty section is found. The maintenance men are then sent out to repair the fault.

The maintenance groups usually are furnished with small rail motor cars for maintenance requiring only light ladders. For heavier work tower cars are handled by steam locomotives drafted from some other



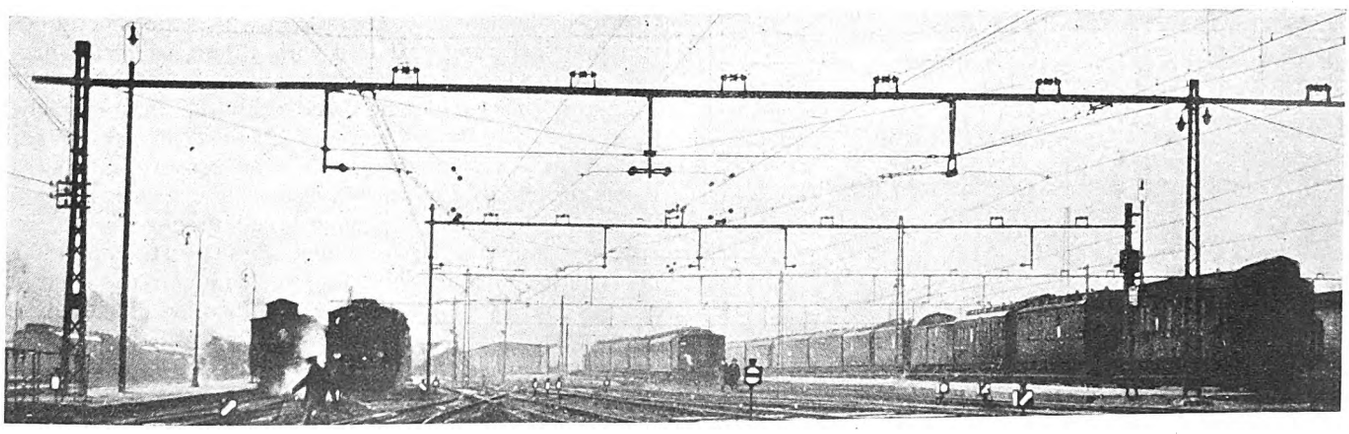
Single-track line showing use of concrete poles

MILES OF ELECTRIFIED TRACK AT ENDS OF YEARS 1924–1927, GERMAN FEDERAL RAILROADS

	1923	1924	1925	1926	1927	Building
Miles electrified	382	405	582	652	773	201
Electric locomotives	114	152	246	301	316	98
Multiple-unit cars	191	250	287	343	341	699
Ton-miles hauled	1,236,000,000	1,730,000,000	3,080,000,000	4,000,000,000	...	...
Kilowatt-hours used	64,000,000	84,000,000	148,000,000	192,000,000	...	...

CHARACTERISTICS OF GERMAN ELECTRIFIED SECTIONS

		End of 1927						Year 1926		
		Miles of Electrified Lines		Locomotives		Multiple Units			Millions of		Load Factor in Per Cent
Section	Service	Operating	Being Built	Operating	Ordered	Operating	Ordered	Power Plant, Kw.	Kw.-Hr.	Ton-Miles	
Silesia	Heavy grade, general	158	56	71	21	21	...	24,000	46	1,170	38
Leipzig	Heavy local, passenger	113	..	75	29	3	2	26,500	34	1,087	42
Bavaria	Some grades, general	378	50	49	47	25	15	79,600	51	1,130	31 to 37
Baden	Miscellaneous	30	..	16	..	..	...	.....	7	73	..
Berlin	Suburban	70	95	...	1	140	341	.....	25	102	..
Hamburg	Suburban	20	..	...	..	150	...	28,500	29	436	33
Others	Miscellaneous	4	..	5	..	2	...	.....	..	.....	..



Old type yard construction with crossbeams in Silesia. Note absence of deflectors and use of intermediate wire

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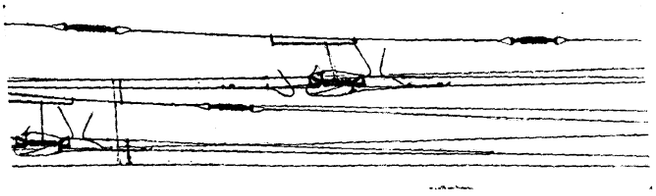
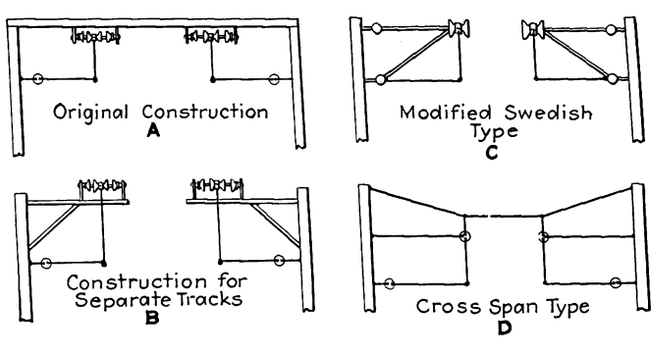


Yard section breakers with simple insulation. Messenger insulator removed from arcing region for protection

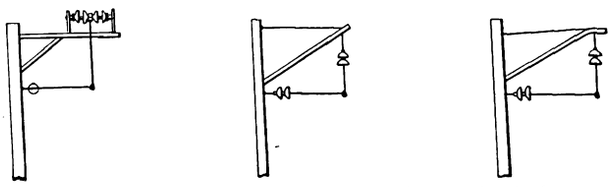
service when needed. The latest equipment for the heavy work is a self-propelled car, with a collecting pantograph for operating a motor-generator set off the 15-kv. contact wire when in live sections. The car is driven by d.c. motors, which are supplied from either the motor-generator set or storage batteries charged by it. A second pantograph is used when in a dead section for grounding the contact wire readily and for gaging its alignment at the same time. The size of maintenance crew varies. A typical group, however, is one of seventeen men which takes care of 62 route-miles, of which 12 miles have four tracks and the remainder double-track.

Many Types of Overhead In Use

The overhead construction of the various groups has been through many stages of development, and nearly every type of design has been given a trial. In the Silesian section, for instance, the types as shown below have been installed. The original 328-ft. spans were found to be too long because the wind blew the contact out of line. Also, the two tracks were not mechanically separate. A modified Swedish Z construction was tried but the longitudinal strength was not considered sufficient. Cross-spans were also tried, but the possibilities of breakage were considered too great to permit their use on the main line. In the yards, crossbeam supports were used at first, but the visibility through the structures was found too low, so various forms of cross-span design have been installed. Concrete poles made by the centrifugal method are in service in some places. Their expense is too great to justify their use. The construction contemplated for line extensions in Silesia is for use with mechanically separated tracks and normally makes use of bracket poles. Two-track brackets will be used for some distance at each signal to permit an unobscured view of the signal for the enginemen. Pin insulators are to be used at the points of support because of their cheapness and the need for shorter poles. Spans 460 ft. long will be used with intermediate steady braces on the shorter poles. In the last few years the Bavarian group has expanded more than any of the other groups and has done considerable developmental work. Originally heavy yard construction of the cross-span type, with double insulators throughout, was used. With the advent of the so-called "stabi" and suspension type insulators much lighter yard and main-line designs have been possible. Mechanical separation of tracks has been retained in all designs and the separation is considered most essential to safety. Grounding of steady spans in all yard construction has been insisted on as a safety measure for linemen and to keep all insulators under voltage continually.



Types of overhead used on Silesian main lines



Bavarian single pole construction for mechanical separation of tracks

General details of the catenary design have been standardized for all groups. A copper contact wire of 198,000 circ.mil cross-section is used on the main-line sections and of 158,000 circ.mil on branch and yard lines. Weight devices hold the contact wire in constant tension. On the Silesian system tensions of 2,600 lb. are used.

A messenger cable of bronze or galvanized steel is used, having a cross-section of 0.078 sq.in. and a diameter of nearly $\frac{3}{8}$ in. The hangers are made of stranded bronze cable spaced every 41 ft. Fittings are all of non-corrosive material. The catenary design allows for wind loads of 14.3 lb. per square foot and ice loads of about 0.5 lb. per running foot of catenary at 18 deg. F. The minimum temperature allowed for is —4 deg. F. The first catenary design was based on the use of an intermediate strand to give flexibility to the contact, but experience has shown that this is unnecessary if flexible hangers and "soft" steady devices are used. In the earlier designs many pantograph failures were caused by the wind swinging the catenary to the side on the long spans. A study has shown that with the simple catenary 246 ft. is the maximum distance between lateral supports that can be used with a maximum wind velocity of 69 m.p.h. and an allowed displacement of 29½ in. from the center line of the track.

Pantographs Employ Auxiliary Bows

The pantograph used is typically European, with a main frame and an auxiliary bow. The shoe itself is usually of aluminum, greased or not, as local practice dictates. Some experiments have been made recently with carbon shoes. If these shoes are used on sections along with others they are worn down in a short time, but if the carbon shoes alone are used a hardened surface is formed on the copper contact on which the shoe glides with practically no wear and with almost perfect collection. The wear of the contact wire is slight with the aluminum shoes and eliminated with the carbon. The pressure on the wire averages about 8 to 10 lb. per shoe. The wire is arranged to zigzag from one side of the center line to the other at each pole with a maximum displacement of 23½ in. The usual practice is to run with two pantographs up, which eliminates the sparking. The pantographs are built the full width of the shoe so there are no horns on the ends of the shoe under which the contact might catch if it should drop off the shoe.

The various groups of the German Federal Railroad which have used electric traction have experimented extensively with electric locomotives. There has been little attempt at standardization because of the different man-

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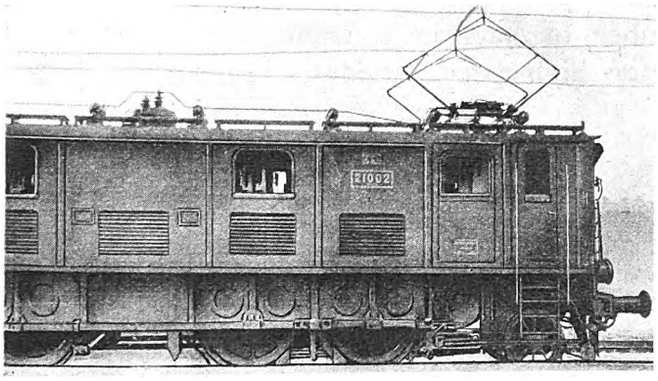
agements, the different requirements and the lack of sufficient experience with any one type to justify adopting it as a standard. The recent development of the Buchli and quill drives in Europe has made the situation all the more uncertain in passenger locomotive design. The side-rod type with a single large motor and two rods connecting to jackshafts in line with the driving wheels seems to retain its popularity, particularly in Silesia. Light weight and cheapness are points in favor of this type. In Bavaria, the Buchli drive has been tried with success. The easy riding qualities of this locomotive are noticeable. More recently the quill drive has become prominent and bids fair to be the main type for passenger service. The wide range of gear ratios possible



Brown Boveri passenger locomotive using Buchli drive. The pantographs are of light construction with auxiliary bows

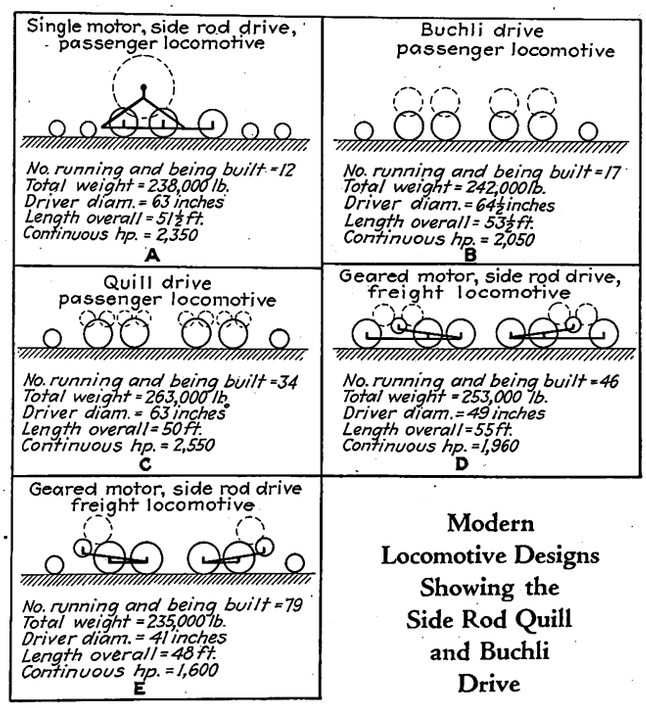
and the use of higher twin motors, together with the ease of handling the running gear and motors seem to give it an advantage over the Buchli drive, in the opinion of the engineers. For freight service the geared side-rod drive is still standard.

Electric control equipment for the locomotives shows many new developments. In some types a contact slides over the transformer taps on top or alongside of the transformer, with an arrangement to prevent short-circuiting of the winding. An ingenious commutator device has been constructed to give continuous voltage variation between taps so there is no arcing. In other types contactors are used as in American practice.

Resistance braking is to be tried on some of the locomotives used in mountainous territory, with a view both to decreasing brakeshoe wear and reducing the motor troubles caused by metal particles from the shoes.

Investment Figures Are Important

The capital invested in the various electrifications was given in the Reparation Commissioner's fifth report for the year ending Dec. 31, 1926. The Silesian work represents some $7,800,000, about $27,000 per route-mile for roadway accounts, and an average of $42,000 per locomotive. The route figures include both single and double-track lines. The Leipzig territory has an investment of about $7,700,000, with $39,000 per route-mile for roadway accounts and an average of $44,000 per locomotive. The roadway average in this case is higher because of the extensive four-track and two-track operation. The Bavarian electrification is by far the largest, with about $15,800,000 invested. Of this, $7,700,000 is in roadway accounts, an average of $28,000 per route-mile with both double and single-track operation. The equipment accounts show an average of about $60,000 per locomotive. The general cost of the overhead system averages about



Modern Locomotive Designs Showing the Side Rod Quill and Buchli Drive

A: *Single motor, side rod drive passenger locomotive*—Number running and being built, 12; total weight, 238,000 lb.; driver diameter, 63 in.; length over all, 51½ ft.; continuous horsepower, 2,350.

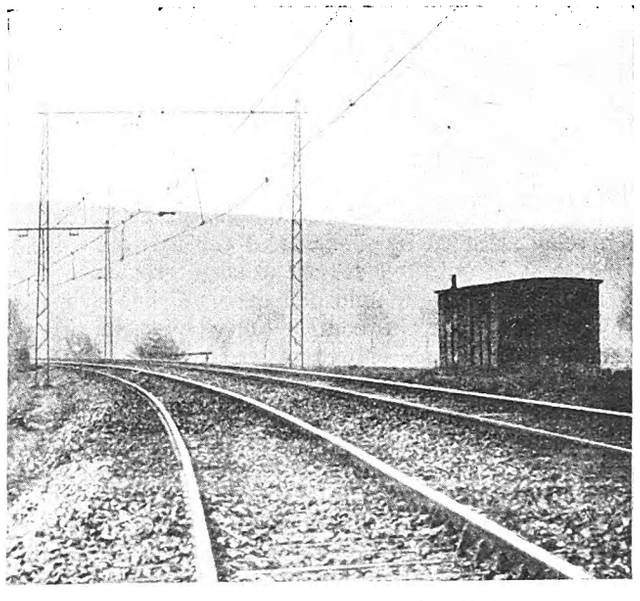
B: *Buchli drive, passenger locomotive*—Number running and being built, 17; total weight, 242,000 lb,; driver diameter, 64½ in.; length over all, 53½ ft.; continuous horsepower, 3,050.

C: *Quill drive, passenger locomotive*—Number running and being built, 34; total weight, 263,000 lb.; drive diameter, 63 in.; length over all, 50 ft.; continuous horsepower, 2,550.

D: *Geared motor, side-rod drive, freight locomotive*—Number running and being built, 46; total weight, 253,000 lb.; driver diameter, 49 in.; length over all, 55 ft.; continuous horsepower, 1,960.

E: *Geared motor, side-rod drive, freight locomotive*—Number running and being built, 79; total weight, 235,000 lb.; driver diameter, 41 in.; length over all, 48 ft.; continuous horsepower, 1,600.

$5,000 per track-mile for main lines and $3,500 for branch lines, not including yards. The electrification of the suburban lines about Berlin will call for an investment of $40,000,000, more than the combined totals of all the others. One estimate allows $14,000,000 for cars; more than $2,000,000 for the third rail distribution system for 90 route-miles; about $12,000,000 for transmission cable and the 44 substations; more than $2,000,000 for signals, telephone changes and the electrolysis prevention, and more than $5,000,000 for shops, inspection facilities and right-of-way changes.



Two-track main line with long span in the Silesian territory

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Electrical Equipment for

Broad Street Subway Cars

Has Interesting Features

Cars for Philadelphia's new rapid transit system will be powered with 420 hp. each. The control makes it possible to accelerate any number of cars in a train automatically and provides for high-speed schedules

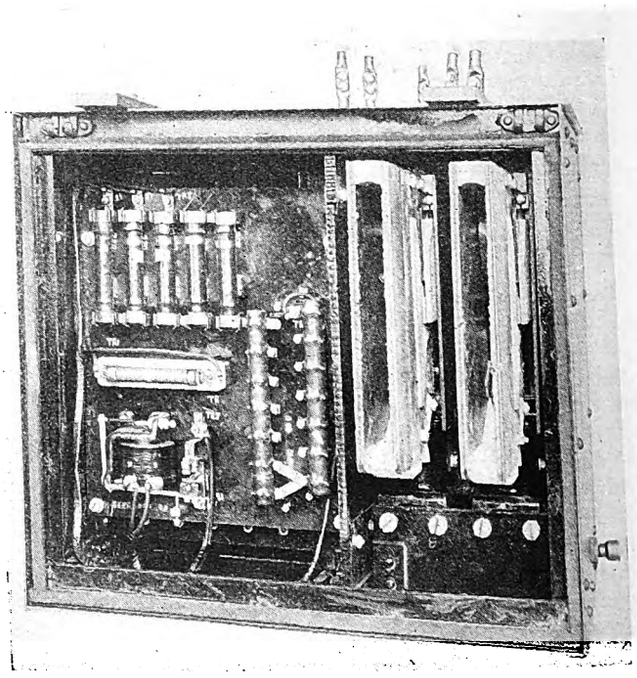
MOTIVE power of the 150 all-steel cars for the new Broad Street subway to be operated by the Philadelphia Rapid Transit Company will consist of two Westinghouse No. 581-A-1 motors for each car. These motors will have a one-hour rating of 210 hp. at 600 volts, and as there will be two of them mounted on one of the two trucks of each car, the total power will be 420 hp. Both motors will be axle-mounted with nose suspension. The armature coils are in one piece, with "double-deck" construction. This minimizes the joints and gives mechanical strength and low losses. The dual ventilation system used affords protection to the brushes and commutator from brake dust, and makes possible a high motor rating for the weight. Heat treated helical gears of forged steel are pressed on the axle. The gears have 63 teeth and the motor pinions 20 teeth. The complete weight of the motor with gears and gear case, is 5,710 lb.

Westinghouse type ABF multiple-unit automatic control is arranged for series-parallel connections of the motors, with automatic acceleration and provision for tapped field on the last running notch in parallel. Current to actuate the control apparatus is taken from a 32-volt type B-2-H Edison storage battery. Trains will consist normally of from one to eight cars, and can be run from any one of the master controllers.

Twelve electro-pneumatic switches establish the motor circuit connections, transfer the motors from series to parallel and commutate the motor circuit resistance. The control circuit gives six steps with the motors in series and four steps in parallel. The tapped field connection is effective only on the last parallel step. Transition from series to parallel is by the bridging method.

Automatic acceleration is accomplished by a current limit relay actuated by the current through one of the motors. It is adjusted for an average acceleration of 1.9 m.p.h.p.s. with an unloaded car. A supplementary relay will advance the control notch by notch under emergency conditions with excessive loads. The air for actuating the control devices is taken from the brake system through a reducing valve adjusted to maintain a relatively constant pressure of 70 lb. per square inch.

An important feature of the control equipment is the use of integral, interchangeable switches. Each switch is a complete unit, including contacts, blowout coil, arc chute, magnet valve and operating cylinder. Two units mounted in a separate frame act as a line switch. The other ten are included in the control box. The units in the line switch and control box differ only in the size of the magnet valve exhaust port and in the length of the arc chute. Any switch may be removed as a unit from either the control box or the line switch by breaking the air and electric connections and removing three mounting bolts.



Front view of line switch showing arc chutes, adjustable resistance in operating coil circuit and interlocking relay

The control box is an assembly of ten of the unit switches, a sequence drum and an advance relay in a structural steel box. A skeleton frame on which the apparatus is mounted, is built up of angles between two end plates. Two side covers are latched in place and are easily removable, while the bottom cover has a fixed hinge and is bolted in place. The only parts requiring attention from the front are the arcing contacts of the switches and the advance relay. By opening the rear cover the air connections, interlocks, valve magnets and switch shunts are exposed for inspection. The main wiring connections are made at the rear of the group at the cable terminals located on a vertical panel on the back of each switch. All main circuit leads are brought out

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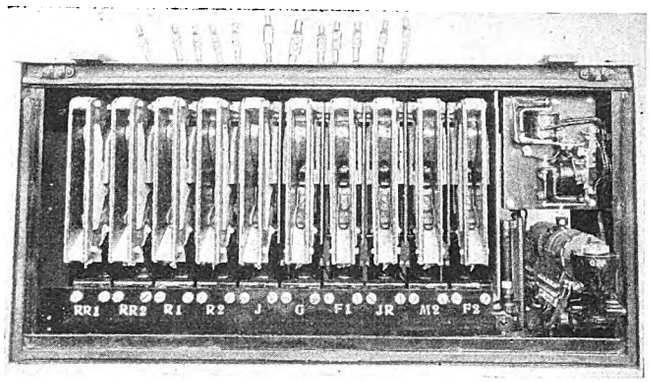
through treated maple bushings and extend 12 in. beyond the limits of the box. The extended leads permit the semi-conduit type of car wiring which allows the box to be disconnected from the car cables.

The sequence drum is essentially an auxiliary, remote-controlled master controller. A set of contact fingers mounted on a base make contact with copper plates on a drum, which is rotated through a rack and bevel gears by a balanced pressure air engine. This drum is directly under control of the current limit relay, and it stops and starts on each notch in direct response to the lifting and dropping of this relay at a pre-determined value of motor current.

When abnormal loads or grades would prevent normal automatic acceleration, pressure on the advance button in the motorman's cab causes the advance relay to short-circuit the contacts of the limit relay and the sequence drum will move to the next notch. As it moves, an additional coil of the advance relay is energized, opening the short-circuit across the limit relay contacts and again leaving the progression of the sequence drum under the control of the current limit relay. This action can only be repeated by first releasing the advance button located in the cab.

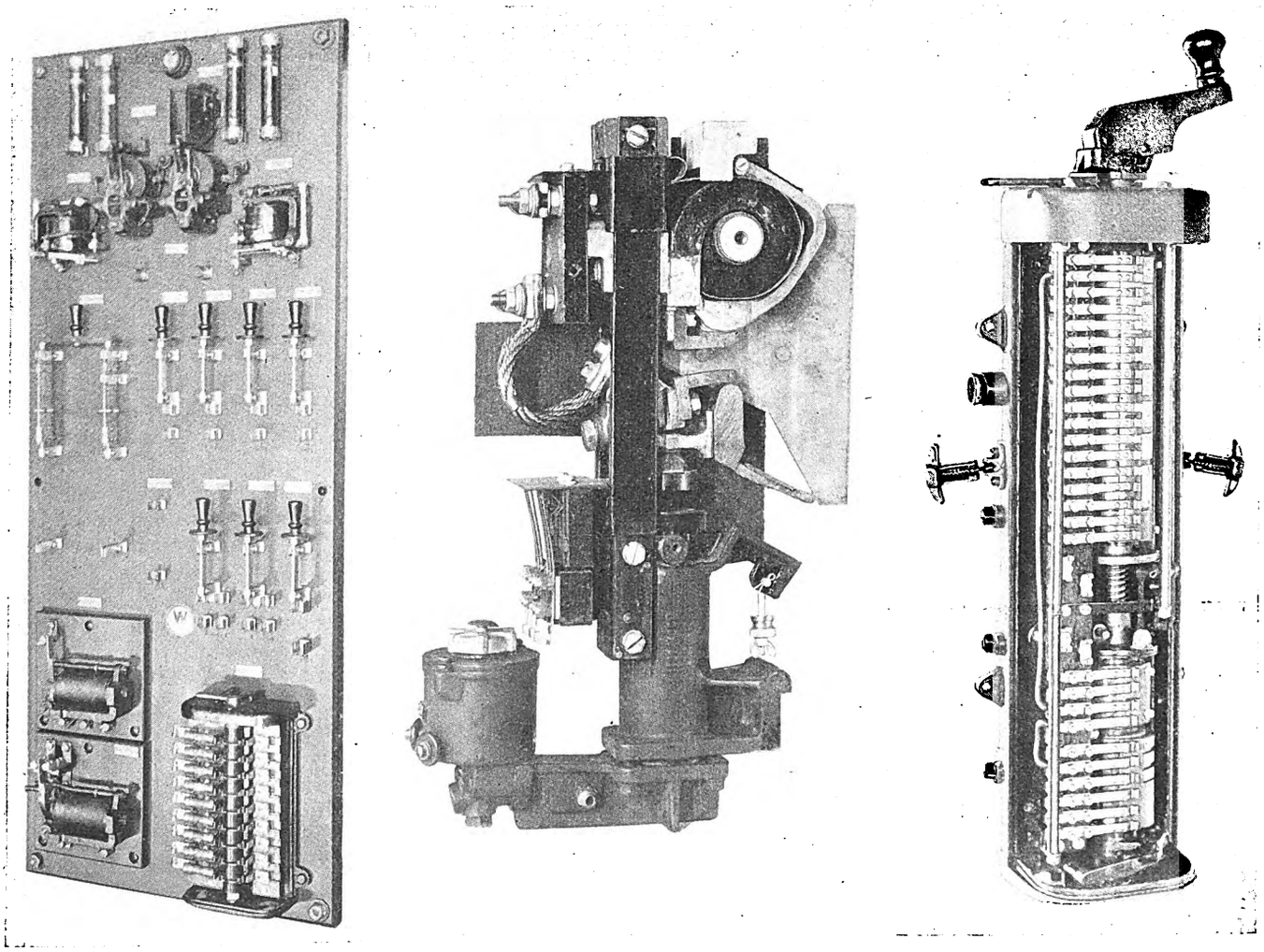
Two unit switches, practically duplicates of these in the control box, two overload relays, a line switch interlocking relay and the necessary resistor tubes and a fuse all assembled in a box of similar construction to the control box, constitute the line switch. Both of these units



Control box with cover removed

are connected in series, with the first series resistance for the switching position connected across one switch. The latter, therefore, also acts as a resistance switch to short-circuit this resistance on the second and succeeding notches. This series connection of the line switches is of particular importance with a short-circuit, the introduction of resistance reducing the maximum current taken from the line and also lessening the severity of the arc rupturing duty.

The operating coils of the line switches are energized directly from the third rail circuit so that the main motor circuit is opened immediately upon loss of power for any reason. This direct control of the line switch oper-



At left, low-voltage auxiliary panel. In center, unit switch with sides removed. At right, master controller with cover removed

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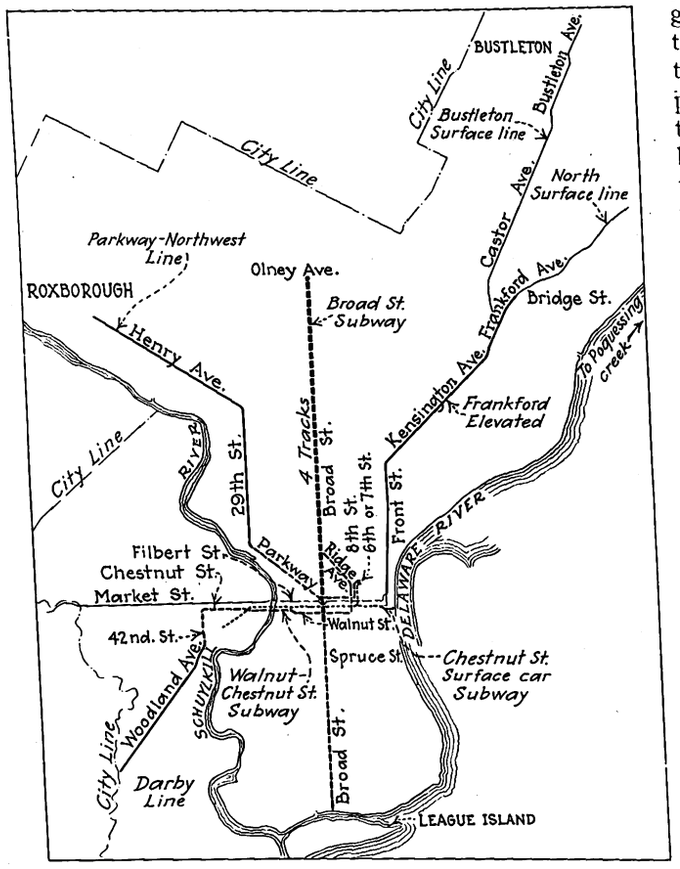
ating coils from the line without the intervening time element of a line relay, and the use of magnet valves with unusually large exhaust ports makes it particularly effective in protecting the main motors against flashing when crossing gaps in the third rail. The line switch is so interlocked that if it is opened for any cause, the control returns to the first position before power can again be applied, and advances automatically after line voltage is restored to the position indicated by the master controller. Since the line switches are quick opening, the arcing duty is removed largely from the switches in the control box, either while the equipment is operating normally or with overload.



Map of Philadelphia Rapid Transit Lines showing extent of Broad Street subway

Two overload relays are used, one in each motor circuit. Each relay may be set to trip at a value slightly above the peak current drawn by one motor in regular service. Both relays have a common reset coil, which further is interlocked so that in a train only the reset coil of that relay, or relays, which is in the tripped position is energized when the reset button is pushed in the motorman's cab. This minimizes the current in the reset wire, insuring adequate voltage for operating the reset coil, even in the rear car of a long train.

The interlocking relay in the line switch is used only for interlocking the reverser, which is controlled from the battery circuits, with the line switch, which is controlled from the trolley circuit, so that the line switch cannot close until the reverser is fully thrown. The reverser, which is of the drum type, is completely isolated from the other main current-carrying parts.

The master controller has a main or accelerating drum, a reverse drum and an emergency drum. On the main drum are four positions, namely, off, switching, series and parallel. In the switching position, a circuit is established from the power supply through the two motors of the car and all of the accelerating resistance in series, to ground.

In the series position control circuits are progressively established until the motors are connected directly in series. In the parallel position the control is advanced to connect the motors in full parallel. The main handle performs two functions; first that of accelerating or shutting off power; and second, that of stopping the train in emergency by applying the air brakes, both by energizing the emergency brake valve in the electropneumatic brake system through contacts on the emergency drum and by operation of a pilot valve which in turn actuates an application valve connected directly in the emergency brake pipe line. The first function is performed by rotation of the handle, the second by vertical spring action which is initiated if the operator's hand is removed with the controller in an operative position. This "dead-man's" feature can only be cut out when both the main and reverse drums are in the "off" position. A separate reverse drum controls the direction of motion of the train and also operates several auxiliary circuits as required.

A push-button box adjacent to the master controller provides a means for energizing the main control circuit and the overload reset and advance relays when required. At the front of each car arranged conveniently for the motorman, are two control panel boards. On the low-voltage panel are the battery charging relays, main motor control cutout switch, door control and signal lamp relays and the disconnecting switches for the various low voltage auxiliary circuits. On the high-voltage panel are the disconnecting switches for the high-voltage auxiliary circuits, including car and cab heaters, door-engine heaters, lamps, fans and air compressor, and also the emergency lamp relay, main motor limit relay and heater circuit relays.

Relays on the upper part of the low-voltage panel provide for keeping the storage battery fully charged. Current for charging the battery is taken both from the compressor circuit and direct from the line. When the compressor is running, a contactor closes, shunting a part of the current through the battery. To supplement the charge from this source a pilot relay, connected across the battery and adjusted to the required range, controls a second contactor which closes or opens the circuit from the line through a current-limiting resistor and the battery in series. Line relay protection prevents draining the battery if the line voltage fails.

Door control, heater, fan, lighting and other auxiliary details in general, follow established practice. A feature of the heater control is the use of a peak load relay which automatically cuts off the heaters at current peaks during acceleration to decrease the total drain on the system. Five Westinghouse fans are provided as a part of the equipment for each car.

Normal lighting of the car is provided by 22 lamps connected in series. Both the sockets and the lamps are short-circuiting, so that if a lamp is removed, or burns out, the circuit is not opened. In series with the lamp circuit is the operating coil of an emergency lamp relay, located on the upper portion of one of the panels, which closes the circuit to emergency lamps operated from the storage battery in case of failure of the main lighting circuit or of loss of contact rail voltage.

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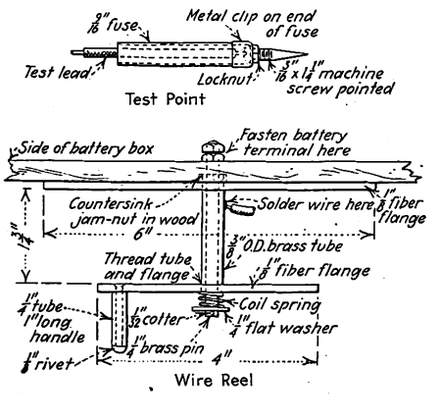
Maintenance Methods *and* Devices

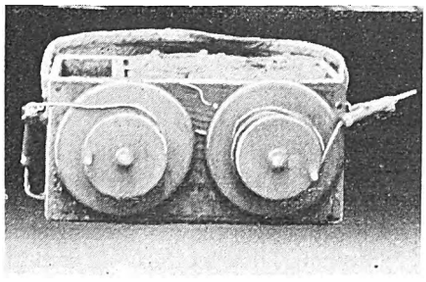
Connections on Bell Box Saves Time*

By Charles Herms
General Foreman, San Diego Electric Railway, San Diego, Cal.

BELL BOXES used in the shops of the San Diego Electric Railway have a particular feature in the provision of reels for the leads, which are made of No. 20 flexible rubber-covered wire. Each lead is 50 ft.



Details of wire reel and test points used on bell boxes



Type of bell box used in the shop of the San Diego Electric Railway

long. To keep the wire from unreeling at random a friction spring is placed on the reel shaft.

The ends of the test leads are fitted with test points made of discarded $\frac{9}{16}$-in. cartridge fuses. One end of the fuse is cut off and a hole drilled through the brass clip on the opposite end to permit the insertion of a $\frac{3}{16}$-in. pointed machine screw. The end of the test lead is looped around the head of the screw and a long nut draws this tight.

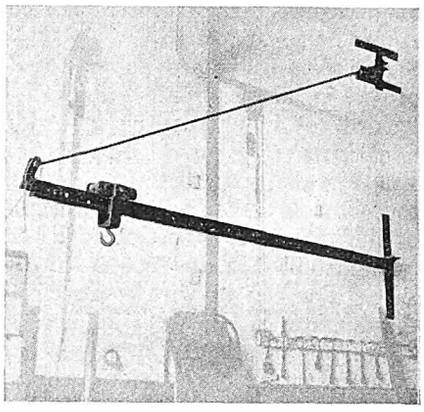
Positive and negative leads are fastened respectively, one to each reel shaft as indicated in the sketch, the circuit thus being completed through the shaft to the brass reel core. This type of construction has proved a great time saver, for any length of lead can be drawn out quickly and independently. The annoyance of having to untangle leads is prevented; due to the method of mounting on the reels and fastening them to the test points, there is little danger of broken leads. Each test point is mounted on a standard fuse clip, one on each side of the box. This provides for instant use and eliminates the necessity for having to hunt for the ends of the leads.

*Submitted in Electric Railway Journal *Prize Contest.*

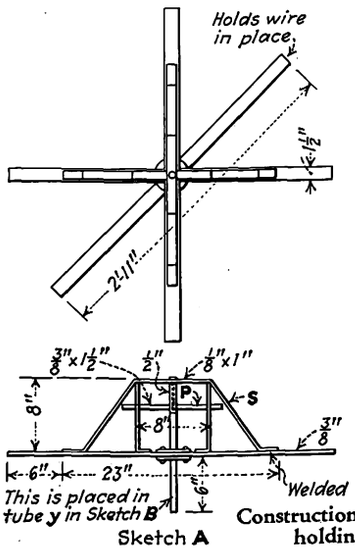
"T" Rail Swinging Boom

WHEN traveling cranes are not available some other provision must be made in the shop for lifting heavy parts undergoing overhaul. This has been done in the shop of the Jamaica Central Railways, Jamaica, N. Y., by the installation of swinging booms fastened to the wall or other support. These are located in various parts of the shop where needed. The horizontal member is an 80-lb. T-rail inverted. A chain hoist is suspended on a trolley, which runs on the base of the rail. A solid forging drilled for a 1-in. pin, bolted to one end of the rail, fits into a $\frac{5}{8}$x4-in. "U"-shaped bracket fastened to a $\frac{5}{8}$x4-in. plate bolted to the wall. The other end of the rail is fitted with two $\frac{1}{2}$x2-in. "L" brackets bolted to either side of the web. The tension member is a 1-in. round rod fastened to these brackets with a 1-in. bolt. Its other end is held by a $\frac{5}{8}$x4-in. "U" bracket fastened to a $\frac{5}{8}$x4-in. plate bolted to the wall. This rod is installed at about a 45-deg. angle with the T-rail.

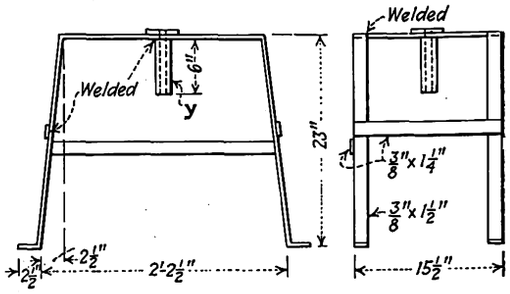
The chain hoist trolley is made from 1x3-in. stock and the rollers, spaced at 9-in. centers, have 3 in. diameter and rotate on 1-in. axles. The lifting hook is fastened to a bracket made from 1x3-in. stock. Guide plates secured to the inside of the bracket prevent tipping.



These booms were not expensive to construct and have been satisfactory for truck overhauling



Sketch A



Sketch B

Construction details of reel for holding coil of wire

Adjustable Wire Reel

DIFFICULTY always is experienced in keeping the turns of a reel of wire from becoming entangled when being unrolled if precautionary methods are not employed. This is being prevented in the shop of the New York, Westchester & Boston Railroad, Westchester, N. Y., by the reel illustrated. This is made in two parts, a base and a revolving support for the coil of wire. The base is

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made of $\frac{3}{8}$x1$\frac{1}{2}$-in. bar braced with $\frac{3}{8}$x1$\frac{1}{4}$-in. straps. All parts are welded. In the center is a tube 6 in. long and $\frac{5}{8}$-in. inside diameter. This acts as a centering device and bearing for the revolving element, which is made with two $\frac{3}{8}$x1$\frac{1}{2}$-in. crossbars 35 in. long, welded at their centers at right angles.

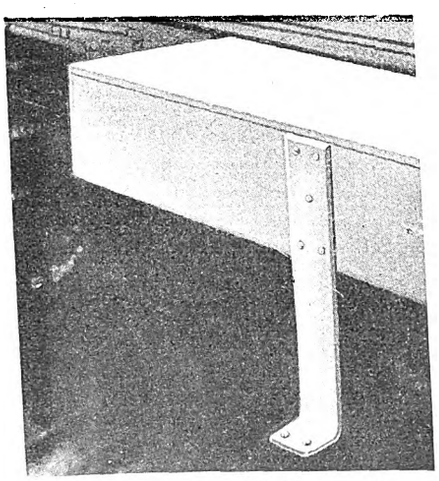
A conical framework support made of $\frac{1}{8}$x1-in. material and 8 in. high is welded to these cross bars. Additional strength is provided by vertical straps of the same material. A $\frac{1}{2}$-in. rod, 6 in. long, welded to the center of the crossbars, drops into the $\frac{5}{8}$-in. tube installed in the center of the base. The coil of wire is placed on the surface *S*. A $\frac{3}{8}$x1$\frac{1}{2}$-in. bar, *P*, 35 in. long, suspended on a $\frac{3}{8}$-in. bolt fastened to the center of the conical frame, rests upon the top of the coil and prevents entanglement of its turns.

Support Prevents Breaking of Sand Hopper Bases*

By R. T. Chiles

Master Mechanic Cumberland County Power & Light Company, Portland, Me.

Due to the design of the sand hoppers used on the safety cars of the Cumberland County Power & Light Company, the weight of the sand is not directly over the base. This resulted in breaking the base of some of the sand hoppers and increased maintenance. To overcome the trouble, a support has been added with one end fastened to the car floor and the other to the top side of the sand hopper. The support is made of 2-in. x $\frac{1}{4}$-in. soft steel. This corrected the fault and prevented the breaking.



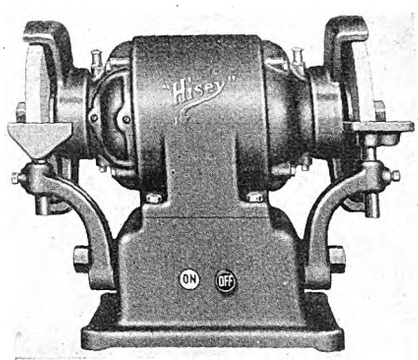
Additional support installed on sand hopper

*Submitted in Electric Railway Journal Prize Contest.

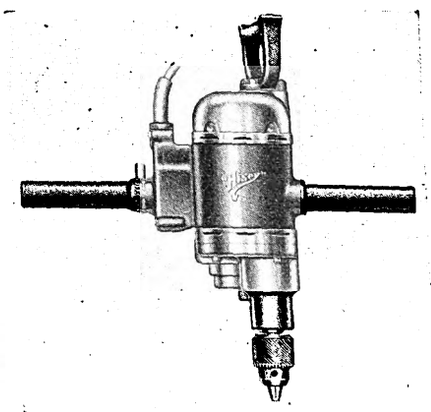
New Equipment Available

Electric Grinder and Portable Electric Drills

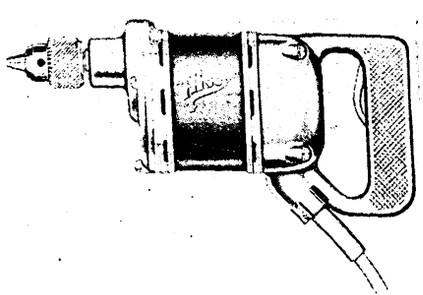
Electric tools of interest, three in number, are anounced by the Hisey-Wolf Machine Company, Cincinnati, Ohio. These include a $\frac{1}{4}$-in. drill, a $\frac{1}{2}$-in. drill and a 6-in. $\frac{1}{4}$-hp. grinder. Noteworthy features include motors mounted with ball bearings which are fitted so as to eliminate the slip and creeping action. Spindles are of liberal dimensions and are hardened and ground where necessary. Brush-holders are mounted as a separate unit on a Bakelite yoke and have adjustable spring tension. These small tools are of the same general construction as are incorporated in larger machines by the company.



6-in., ¼-hp. grinder



¼-in. electric drill

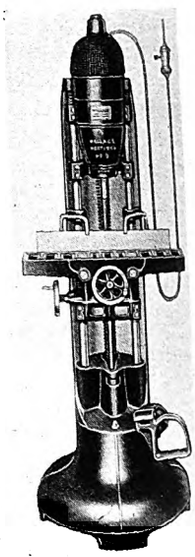


½-in. electric drill

"Safety first" — "tram your trucks" — don't ram them.

Portable Hollow Chisel Mortiser

Boring of square holes in wood has been common for years and improved equipment for this work is being made frequently. Now a portable hollow chisel mortiser has been announced by J. D. Wallace & Company, Chicago, Ill. Three easy rolling casters in the round cast-iron base make it easy to move the machine. Mounted on the upper carriage is a General Electric vertical motor designed to meet the requirements of this machine. A current of air drawn through a screen at the top is forced downward by a fan on the armature shaft and cools the chisel and bit and also blows chips away.



New electrically driven portable hollow chisel mortiser

The chisel holder is built into the lower motor end flange which completely incloses the bit chuck mounted on the motor shaft. Normal speed is 3,450 r.p.m. This has been found correct for all work falling within the capacity of this machine, which bores square holes up to $\frac{1}{2}$ in. and round holes up to $\frac{17}{32}$ in. diameter. The motor is inclosed and dustproof.

The motor head is depressed for mortising by means of a treadle with an iron stirrup which always hangs vertically. The head may be limited to any desired lower position by a setscrew in the rear of the base and is carried back automatically to the upper position by an adjustable tension spring. Vertical and horizontal adjustments are made through hand wheels, the tables sliding on machined rods.

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Association Activities

Transportation and Engineering Topics Receive Attention at Rome

Technical sessions with several neighboring trips extend over a week. Later the delegates visit Turin and Milan. Attendants at the convention represented 28 countries

THE Rome convention of the Union Internationale de Tramways, de Chemins de fer d'Intérêt local et de Transports Public Automobiles began informally on Sunday, May 6, when there was a reception to the delegates and their friends in attendance at the meeting.

The first official session of the Congress was held the next morning at the National Capitol. The Salon of the Palace of Senators was put at the disposal of the association by the Italian government. Here the session was called to order at 9:30 a.m. About 28 countries were represented. This was also attended by a large number of ladies. The delegates were welcomed to Rome by the governor of Rome and also by the Italian Minister of Communications, Mr. Ciano. The latter brought greetings from the King and also from Premier Mussolini, saying that the latter expected to be presented at the opening session but was unavoidably detained. Mr. Ciano declared that the government was pleased that Rome had been selected for this meeting and emphasized the importance of transportation in the social and economic life of every country.

President De Lancker expressed the appreciation of the association for the hospitality shown to the delegates and asked Mr. Ciano to express its gratitude to Premier Mussolini for his interest in its work. He referred to the fact that the present convention of the association was the first since the war representing all the countries in Europe. It now has more than 1,000 members. He gave his address, successively, in French, Italian and German.

One-Man Cars

The first technical question taken up was the report on "One-Man Cars" by Mr. Bacqueyrisse, general manager S.T.C.R.P. (Paris Surface and Bus Lines). An abstract was published on page 910 of the issue of June 2.

The discussion was animated, the delegates expressing their interest in the advantages of one-man operation, brought out in the report. An Italian delegate declared it especially important for roads with a slight margin between receipts and expenses. He said popular approval and permission from the authorities would be more easily secured if the association should formally indorse one-man operation as desirable. President de Lancker said he would appoint a committee to consider such action and report.

F. de Lancker

President Union Internationale de Tramways, de Chemins de fer d'Intérêt Local et de Transports Publics Automobiles and general manager Brussels Tramways.

In the afternoon, by invitation, the delegates were received in a special audience at the Vatican. In his talk to them, the Pope spoke about the means of transportation as one of the most important factors in the civilization of the world. He gave to all his Apostolic blessing.

Air vs. Electric Brakes

A large part of the session on Tuesday, which was held in the Doria Palace, Rome, was given up to a consideration of street railway brakes. Three reports were presented on this subject, namely, by Mr. Vente, chief engineer Marseilles Tramways; Mr. Allard, chief operating engineer Société Nationale de Chemins de fer Vicinaux of Brussels, and Mr. Cuccoli, engineer Milan Tramways.

The report of Mr. Vente related to the braking of city cars and comprised seven chapters, relating respectively to: Brake rigging acting through shoes on the wheels, mechanical and axle brakes, vacuum brakes, compressed air brakes, compressors and vacuum pumps, electric braking with resistance and with magnetic shoes, special types of brakes. There were also appendices on automatic adjusters for brake rigging, the speed of modern compressors and magnetic brakeshoes. In discussing the choice of brakes the speaker pointed out that for heavy cars, the compressed air brake dominates in America whereas the rheostatic or electromagnetic brake is the most popular in Germany. In recent years, he said, the design of electric braking equipment has been considerably improved. In Germany 84 per cent of the motor cars and 76 per cent of the trailers have been equipped with electric brakes.

Mr. Allard, while mentioning all types of brakes which are used on electric tramway rolling stock, devoted his discussion primarily to recent improvements in braking equipment for suburban railways, both steam or electric. In this connection he outlined the characteristics of the Pieper system, as manufactured by the International Automatic Brake Company of Liége, Belgium, i.e., an automatic continuous brake with vacuum release, particularly suitable for steam trains, and a quick-acting electropneumatic brake and with automatic adjustment of clearance between shoes and wheels. In both systems there is a supply of compressed air, at constant pressure, the transmission being made by means of oil. In the first system the release is made with a vacuum and the control is either through vacuum or electricity (battery). In the second system, which is suitable for electric cars, the release and the application are electric. The two systems are continuous and automatic. The second dispenses with adjustment of the rigging; it permits its reduction to very simple terms, and through its action it maintains between two oil cylinders a difference of pressure which may be utilized for the operation of auxiliary apparatus, such as collecting current, closing doors, etc. Mr. Allard also pointed out the extent of use, chiefly in Germany, of the rheostatic brake, sometimes combined with an electromagnetic brake on the rail or with the solenoid brake. He also referred to the drum brake on the axle or on the armature shaft and mentioned tests which have been made with shoes filled with abrasive material acting against the rails.

Mr. Cuccoli's report related principally to the regenerative braking equipment of the Somajni type which has been installed on several motor cars of the Milan Tramways. He said that on one level line the saving of energy with regeneration, compared with the ordinary equipment, has been found to be about 24 per cent. The economy so found was measured on the same cars before and after they were so equipped. At the substations the saving in energy consumption was increased to 30 per

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cent. The cost of maintenance of motors, controllers and motor-generators has not been higher than with ordinary equipments. Mr. Cuccoli, in closing, gave a description of the Della Riccia recuperative system as well as a review of the tests which have been made with that system.

In the discussion, Mr. Castaing, engineer S.T.C.R.P. (Paris Surface Railway and Bus Lines), gave some details of the braking system used by his company's Type L car which is equipped with Cardan drive. Brakes are applied to the motor driving shaft and not to the wheels. A delegate from the Warsaw Tramways declared electric brakes superior to air brakes for emergency braking. Mr. Pforr, Berlin Surface Lines, said that tests with different types of brakes were being conducted in Germany. The results will be available to the members of the association after their completion.

The presentation of the paper by Mr. Allard led to a discussion between him and Mr. Castaing on the effect of the motors and gears when the braking is applied to drums or disks on the motor shaft and when it is applied directly to the wheels.

The paper by Mr. Cuccoli on recuperation was followed by an extended and somewhat involved discussion on the economies to be gained by the Della Riccia and the Somajni systems. This discussion, in which Messrs. Della Riccia and Cuccoli took a prominent part, occupied a good part of the session, but no definite conclusions were reached.

Mr. Bacqueyrisse said that the Paris Surface Lines had obtained very satisfactory results with standard (or non-recuperative) equipment. He believed that the expenses of installation and maintenance of the equipment necessary for recuperation would absorb all of the gains from the saving of energy which would be obtained.

The discussion showing no signs of abating, the president asked the speakers to be as brief as possible. He added that they were at liberty to submit any further conclusions in writing.

Mr. Cuccoli, in commenting on the remark of Mr. Bacqueyrisse, said that the cost of the supplementary equipment used with recuperation was not great. According to him the rating of the car motors, when recuperation was used, would not exceed that of equipment ordinarily employed with electric braking in which the current is passed through a rheostat. On the other hand, the application of recuperation decreased the power capacity necessary in the substations as well as the size for the outgoing and return feeders.

Mr. Somajni said that the matter ought not to be regarded so much from the standpoint of economy in energy as from that ease of control as regards the operator.

A delegate from the Rome Tramways submitted a communication giving the results from two cars, one of which was equipped with recuperative equipment; the other in the ordinary way. The latter showed an average current consumption of 116 watts per ton-mile, while the car equipped with recuperative equipment used only 90 watts.

Another delegate spoke of the existence of a line, 9 miles in length, near Lake Maggiore in Italy, possessing a difference of elevation of nearly 2,000 ft. between the termini, on which recuperation permitted the car to go from the higher to the lower terminus without the application of any other brakes.

The conclusion reached as the result of the discussion may be expressed by the statement that the question is not yet settled. The association will receive communications on the subject from those interested.

At the close of the morning session on Tuesday, the president of the association and a large number of delegates visited the tomb of the Unknown Soldier at the Piazza Venezia, where they laid a floral wreath on the tomb in the name of the association.

COMING MEETINGS OF *Electric Railway and Allied Associations*

***June 12-13*—American Wood Preservers' Association, Chattanooga, Tenn.**

***June 14-15*—New York Electric Railway Association, Half Moon Hotel, Coney Island, N. Y.**

***June 20-27*—American Railway Association, Div. 5—Mechanical, annual convention and exhibit, Atlantic City, N. J.**

***June 21-22*—American Railway Association, Motor Transport Division, Atlantic City, N. J.**

***June 21-22*—Wisconsin Utilities Association, Accounting Section, Hotel Pfister, Milwaukee, Wis.**

***June 25-29*—American Institute of Electrical Engineers, summer convention, Cosmopolitan Hotel, Denver, Colo.**

***June 28-29*—Central Electric Railway Association, Cedar Point, Ohio.**

***July 8-12*—Public Utilities Advertising Association and International Advertising Exposition, Detroit, Mich.**

***July 12*—New York Railroad Club, annual outing, Indian Point, N. Y.**

***July 13*—A.E.R.A. Executive Committee on yacht "Florida," New York, N. Y.**

***July 18-20*—American Society of Civil Engineers, annual convention, Buffalo, N. Y.**

***July 19-21*—Pacific Claim Agents' Association, annual convention, San Diego, Cal.**

***July 25-27*—Electric Railway Association of Equipment Men, Southern Properties, Cincinnati, Ohio.**

***July 27-28*—Central Electric Railway Accountants' Association, Detroit, Mich.**

***Aug. 16-17*—Wisconsin Utilities Association, Transportation Section, Sheboygan, Wis.**

SEPT. 22-28, 1928

American Electric Railway Association, 47th annual convention and exhibit, Cleveland, Ohio.

Track Construction

The report on track construction was presented by Mr. Noorbeeck, chief engineer, Société Nationale des Chemins de fer Vicinaux of Belgium. It was published in abstract on page 912 of last week's issue.

Mr. Level, general manager Compagnie des Voies ferrées d' Intérêt local in Paris, said that the purpose of the employment by his company of wooden rail braces on short radius curves in exposed track, mentioned in the report, was to insure the maintenance of the track gage when the cars went around these curves at a fairly high speed. He described the use of reinforced concrete ties for interurban construction. Mr. Garnier, Paris, referred to the increasing use of chrome and nickel alloy for special work. He approved the use of reinforced concrete ties. Mr. Ramy of Brussels described an equipment of clips for attaching rails to any kind of tie; wood, steel or concrete. Mr. Michel, representing a Brussels company interested in electric welding, gave details of methods advocated by his concern, for the electric welding of rail joints.

Rail Cars

The report on rail cars with internal combustion motors was presented by Mr. Mellini, member of the Upper Council of Public Works, Rome, and Mr. La Valle, chief inspecting engineer of railways, tramways and bus lines in Italy. It contained a great deal of data on equipment used and results obtained. Their conclusions, briefly, were as follows: Gasoline cars are best adapted for light fast service on level track or with light grades and favorable curves. As compared with steam locomotives, they permit a reduction in labor and in the cost of fuel, for they consume no fuel at stops. In general, their performance has been satisfactory. Diesel motors, when applied to this work, are of a different design than those used in stationary service or in ship propulsion. Results up to the present indicate a favorable solution in the near future of the application of the Diesel engine to this class of service. Its great advantage is that it reduces the cost of fuel. At present the type of transmission which seems most advantageous for Diesel equipment is the electric. Internal combustion engine rail cars, either gasoline or Diesel, seem especially well adapted for colonial railways which cover vast territories, which are lacking in water and where the traffic does not justify electrification.

In his oral discussion, Mr. Mellini, besides giving a summary of the conclusions of his report, told about a novel combination of bus and rail car on a mountain line having grades as high as 8.3 per cent. The tracks are in reinforced concrete with a very light T rail, weighing only 6 kg. per meter (12 lb.

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per yard). The wheels of the cars are equipped with rubber tires which roll over the concrete, and are furnished with steel flanges to keep the car on the track. The adhesion thus obtained is in the neighborhood of one-sixth. Operating results are satisfactory. Mr. Mellini declared that the employment of rail cars was warranted on lines of light traffic where trail cars were not needed, and where the grades are not too severe.

Mr. Level thought that the use of rail cars under the conditions mentioned is always justified, whatever the profile of the line.

Many speakers urged the desirability of the use of rail cars on many rural lines, notably in Italy. A good many of these systems could have service only by the employment of this method of traction. The light rail car, in certain cases, is particularly well suited for such work.

The association voted to continue the subject on the next convention program.

Electric Track Switches

Improvement in electric track switches was considered in the report of Mr. Riedel of Essen on Wednesday morning. It will be published in abstract in an early issue. Mr. Riedel enumerated several advantages of such equipment, when operated by electricity, among them the time saved over hand operation, economy in labor and reduction of danger to conductors who with ordinary switches are obliged to operate them by hand on the street. According to statistics compiled by him, the number of troubles in switch and solenoid equipment have amounted to only ten per year on the average. The apparatus which he recommended particularly was that in which the switch movement was made by motor.

Mr. Fischer of Budapest described a track switch of which 60 had been installed in that city and 120 more would soon be put in operation. A delegate from Paris gave particulars of track-switch apparatus employed in France. Normally they were operated by the motorman, but the switch could also be thrown by hand.

Mr. Schmidt emphasized the importance of making the track switches conspicuous. In Dortmund, at a congested center, he had built a switch tower for operating the electric switches there. A similar tower exists in Paris at the Place de l'Etoile, according to a delegate from that city.

At the conclusion of the discussion, Mr. Bouton, Paris, suggested the appointment of a permanent committee to take up the subject of the study of track in general.

During the latter part of the session the subject of the employment of high-pressure steam in central power stations was considered.

Trip to Naples and Pompeii

The serious side of the convention was pleasantly interrupted from Wednesday noon until Friday morning by an excursion of the delegates to Naples. On Wednesday afternoon they made a rapid circular tour of Naples and its environs, and on the following day they visited the ruins of Pompeii. This trip was necessarily made hastily, but the delegates will always retain a pleasant memory of it.

Car Schedules

On Friday morning the meetings were begun anew at the Doria Palace in Rome. The report on methods and apparatus for improving car schedules was presented by Mr. Barquin, engineer Brussels Tramways. An abstract will appear in a later issue.

Mr. Autin, Marseilles Tramways, gave a résumé of the practice in that city. It did not differ greatly from that outlined in the paper.

After an exchange of views, in which a number took part, notably Mr. Thonet and Mr. Noirfalise, the delegates expressed their belief that the authorities as well as private organizations should do what they could in large cities to establish staggered hours for employees in offices and shops, so as to extend the length and reduce the intensity of peak hour loading. Mr. Noirfalise pointed out that such hours were helpful not only for large cities but even in the cases of cities of medium size and of small cities.

Track Construction on Reservations

The report on "Electric Railway Construction on City Reservations" was presented by Mr. Lenartowicz of Warsaw. An abstract was published on page 858 of the issue of May 26, 1928.

Mr. Gagné, Paris, expressed himself as in accord with the conclusions of the report but declared that the reservation should be in the middle of the street with the highways on each side. That arrangement was by far the most advantageous. Mr. Schmidt of Dortmund, Mr. Kramer of Berlin, Mr. Level of Paris, and Mr. Callot of Nancy indorsed the idea. One German delegate pointed out that the need for the establishment of tracks on right-of-way in reservations was a consequence of the development of automobile traffic. He was of the opinion that the public authorities, to whom the streets belong, should assess on the automobile users a part of the cost of constructing reservations for street railway tracks. The association voted that the construction of track on reservations and its separation from the street were advisable, whenever the circumstances permitted it.

Bus Motor Design

The report on bus motor design by Mr. Guiffard, manager Compagnie Générale Française de Tramways, of Paris, divided bus motors into three classes as follows: Motors using liquid fuel; motors using various kinds of gas, such as acetylene, illuminating gas and producer gas; and motors using electrical energy. The latter may further be divided into storage-battery cars and trackless trolleys. The greater part of the replies received from the questionnaire indicates that gasoline buses are in the great majority. The speaker said that, at least up to the present, they seem the most generally applicable. As to the other methods, numerous trials have been made with various degrees of success. Among the cars other than gasoline, experience shows the following may be used with confidence under conditions for which they are suitable: Cars with internal combustion engines using kerosene, alcohol, or mixtures of these ingredients with gasoline; cars using producer gas; storage battery cars, and trackless trolleys. Where there is a scarcity of gasoline or even under conditions of free competition, these methods offer an alternative to the gasoline motor bus.

In the discussion an Italian delegate said that in view of the high cost of gasoline in his country the question of a substitute fuel was of very great importance. He mentioned tests which had been made with heavy oils, ethyl alcohol and oil gas.

Mr. Castaing, engineer S.T.C.R.P. (Paris Surface Railway and Bus Lines), gave the results of tests made in Paris with different mixtures of gasoline, alcohol and kerosene. Several of these mixtures, with different proportions of the three ingredients mentioned, have given good results. The practical result is that one or another of these mixtures is employed, according to the relative price of the several components at the time. Alcohol and kerosene have the advantage of being non-detonating, which permits, when they are employed, of increasing the compression, and, as a result, a reduction in the consumption of fuel. Contrary to the general belief, the speaker said, alcohol is not a corrosive so far as the motors are concerned and has not caused any damage by its employment. The Paris bus company has also experimented with both ordinary city illuminating gas and charcoal gas for fuel. The latter, when generated on the bus, has at least certain theoretical disadvantages in any vehicle for the transportation of passengers, among them the disposition of the heat radiated. When employed in bus propulsion, the illuminating gas is compressed to 175 kg. per square centimeter. The trials that have been conducted up to date indicate that an illuminating gas which does not contain more than 10 per cent of oxygen can be compressed without danger to 200 kg. pressure. The reservoirs used for the transportation of this compressed gas are light in weight. Interesting trials are being conducted also with methane gas, and even with storage batteries. The field of the latter is for lines that do not have many grades.

The association voted to continue next year a discussion of the same subject of fuels for motor buses as well as the effect of their employment on maintenance, lubrication and first cost.

Radial Axles

The session on May 12 was given up largely to a discussion of the report on "Radial Axles," as presented by Messrs. Castaing and Harmel. Abstracts of

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these reports were published in the issue of May 26.

The presiding officer, Mr. Mariage of Paris, asked the speakers to give briefly the conclusions reached by them, and this was done.

Mr. Castaing was clearly an advocate of fixed axles, even with a long wheelbase and cars with a length of 11 m. (36 ft.). He advocated double trucks for cars of still greater length. Mr. Harmel of Liége was not in entire agreement with the conclusions of Mr. Castaing. He quoted the results of some tests that were being conducted in Liége and advocated the use of radial axles under certain circumstances, notably when the system had many curves of short radius.

Mr. Vente, of the Marseilles Tramways, cited several examples of the use of differential axles in America and Europe. Mr. Seiber of Nuremburg was in accord with Mr. Castaing. He praised the experiments which had been conducted on this problem to determine the degree of wheel and rail wear after a certain time with radial and rigid axles. A delegate from Poland, in referring to the differences in view between the speakers, suggested that the subject be put on the program for the next meeting.

The presiding officer, Mr. Mariage, expressed this same view and suggested to the speakers on the subject to make their tests together, so that the results would be comparable.

Rail Corrugation and Standardization of Railway Motors

The report of the sub-committee on rail corrugation of the standing international committee on the standardization of street railway rails and track equipment was then presented by Messrs. Thonet and Bacqueyrisse. It will appear in abstract in a later issue. The speakers explained that at the Barcelona convention the committee had recommended the employment for rails of semi-hard steel. In the meantime, it has been discovered that hard steel which has a high elongation gives better results. Now the committee recommends the use of hard steel. According to Mr. Bacqueyrisse, the principal question which remains to be investigated relates to methods of manufacture and these can best be solved by the makers of rails. These problems did not seem difficult of solution.

Mr. Hallet of the Ougree Marihaye Steel Company, Belgium, was not of this opinion, but Mr. Bacqueyrisse replied that the French steel makers had agreed to furnish steel according to the specifications in the report.

In connection with the conclusion of the committee that for steel destined for the manufacture of rails, the quantity $R + 6A$, (in which R equals resistance and A equals elongation), ought to be higher than 175, an American delegate, Mr. Fleming, requested the elongation be measured on the French standard test piece of 100 mm. of length.

A Polish delegate thought that the conclusions lacked precision in some places and suggested that the committee issue a series of rail specifications.

Mr. Bouton replied that the international committee on rail standards had already authorized a sub-committee to do this.

Mr. Peridier presented a résumé of a communication relative to the standardization of railway motors. This communication had for its purpose familiarizing the delegates with what had occurred since the Barcelona convention. The subject had been taken up with the International Electrotechnical Commission. Standardization is being studied by this commission and a report will probably be available for consideration at the 1930 convention of the association.

After the meeting on Saturday, as well as after the meeting on Friday, the delegates made trips to various points of interest near Rome. On Friday they visited Tivoli, and on Saturday they visited Ostia.

Concluding Business

Sunday morning was devoted to a discussion of the subject raised by the consulting committee on long distance telephonic communication, relative to the protection of telephonic cables against corrosion due to electrolysis and other chemical action. This was the conclusion of the technical sessions.

That evening the delegates left for Turin, and on Tuesday they visited at Milan, where they inspected the new cars and rehabilitated street railway system in that city.

Midwest Association Considers Ways to Improve Service

INTENSE interest in whatever promises improvement to existing railway equipment and operating methods was the tenor of the simultaneous sessions of more than 300 members of the Midwest Electric Railway Association and the Service Betterment Committee of the A.E.R.A., at a three-day meeting held in Kansas City this week.

The word speed was heard frequently with speculation active concerning what new cars and equipment the forthcoming convention in Cleveland would bring to light. Speeding up of street cars, while specifically discussed in only one paper, was touched upon by speaker after speaker, indicating the consideration it is commanding on many properties. The association was welcomed to Kansas City by Mayor Albert I. Beach, who assured the delegates of the city's pleasure at their presence. Powell C. Groner, president of the Kansas City Public Service Company, replying to the Mayor, emphasized the necessity for a "cards on the table" policy of fair dealing with both city officials and the public in general.

Discussion Lively at Luncheons

The two round-table luncheons held on Monday were devoted to the general subjects of transportation and maintenance. J. L. Adams, superintendent of transportation Denver Tramway, acted as chairman of the transportation group. Speakers included C. H. Evenson, Chicago; Del A. Smith, Detroit; Jeff Alexander, Houston; C. W. Wilson, Pittsburgh; D. L. Fennell, Kansas City; and Joe Ong, transportation engineer, Cincinnati. Mr. Evenson outlined the methods used for speeding up Chicago street car service. He declared that there is no panacea for slow operation and attributed the success achieved by his property to a combination of suitable equipment and an organization on the alert by constant pressure for better operating performance. Mr. Smith described the express car and local bus service on Jefferson Avenue in Detroit and said that a schedule speed of 18 m.p.h. is easily maintained in the 4-mile express area on this line. Houston's progress in the development of a 10-cent express bus service was outlined by Mr. Alexander. Mr. Wilson explained the functions of the Pittsburgh research department, which was organized to provide a group of engineers unburdened with operating routine to make special studies directed toward the improvement of operating methods and the formulation of plans for the future. Mr. Fennell discussed the steps leading to the new bus permit in Kansas City under which a charge of 15 cents is made for trunk-line bus service. Although there was some drop in riding during the first few days following the increase from 10 to 15 cents in the trunk-line fare, he predicted a rapid recovery from this initial reaction. Mr. Ong presented a brief summary of the rehabilitation program being carried out in Cincinnati, where improvements in physical plant and service have produced increased patronage and a favorable outlook for the property.

The maintenance section luncheon was in charge of R. W. Bailey, general superintendent of maintenance Kansas City Public Service Company. Noise reduction, as viewed from the track construction angle, was the subject of a lively interchange of opinions. Contributing to the discussion were N. R. Love, Denver Tramway, who with A. E. Harvey, Kansas City Public Service Company, presented the pros and cons of the much-mooted question of resilient versus rigid track construction. Others who joined in the general discussion were W. J. Martin, Miami, Okla., and D. E. Druen, Kansas City. A summary of the latest operating and cost data on the gas-electric type buses in test operation in a number of cities in this country was presented by Mr. Cox of the General Electric Company.

Pointing out that the first requirement of a street railway is a sound roadway upon which the cars can operate

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smoothly, that is paved in a way satisfactory to the public, and that can be maintained at the minimum cost, A. E. Harvey, superintendent of construction Kansas City Public Service Company, described what constituted good track. He urged that there were three important points for consideration, a foundation capable of carrying the heaviest cars and trucks, a track of long life, and finally a pavement of material satisfactory for use in track areas. Concluding his paper, Mr. Harvey gave details of the track construction in progress in Kansas City.

Courage and Brains Needed

Declaring that there has never been a time when the future of the electric railway was more shrouded with uncertainty than at the present, J. N. Shannahan, president Omaha & Council Bluffs Street Railway, in a paper which in his own unavoidable absence was presented by C. D. Porter, general manager of the Omaha property, called upon electric railway men to combine courage with brains to solve the difficulties confronting the industry.

"The cities of this country must be served by a system of local transportation," said Mr. Shannahan, "and in my judgment the backbone of it will continue to be the car on rails." He continued: "Except in certain outstanding instances it seems to me that we ourselves have not met the fast changing situation with as much courage as we should have, and certainly not with farsighted vision of our opportunities, to say nothing of our duty."

In a paper on present day conditions and tendencies in the industry, R. P. Woods, president Kansas City, Clay County & St. Joseph Railway, cited statistics compiled by the A.E.R.A. to show the operating experiences of 206 electric railways for 1926 and 1927. Mr. Woods reviewed some of the more pertinent factors showing the trend of last year's business. Outlining what he considers the factors involved in the status of the Midwest Association group of electric lines, he pointed out that the city lines during the four years ending with last year lost by gradual decline an average per line of 14.8 per cent of the number of passengers carried in 1923, and with it suffered a decrease in passenger revenue of 13 per cent. Hard study by the railway operators is needed, said Mr. Wood, to fit their properties into the new scheme of transportation economically and remuneratively. The management and personnel are as good as the best of other organized businesses, he continued, as is attested by the way the railways have survived the competition from private automobiles, buses and trucks, and retained the patronage they now possess.

Treadle operation and its effect on one-man service was discussed by R. L. Frehse, sales engineer National Pneumatic Company, who illustrated his remarks with a moving picture depicting the operation of treadle equipped street cars and buses in a score of United States and Canadian cities. L. E. Gould, president Economy Electric Devices Company, discussed the possible savings to railway properties where changes in physical equipment will reduce the characteristic energy consumption of individual cars and where opportunities for increasing the individual car operating efficiency of the platform man are watched. Reference was made to the experiments carried on in Baltimore and in Chicago analyzing frictional losses in street cars. This paper will be abstracted in a forthcoming issue of the Journal.

R. L. Hermann, transportation manager, Southwestern District, Westinghouse Electric & Manufacturing Company, discussed the progress being made in the improving of cars and car equipment. Declaring that safety, speed, comfort, and ease of passenger interchange are the primary considerations which will influence design of future street cars, Mr. Hermann outlined some of the accomplishments in new motors, control equipment which can be remotely operated, edgewound type resistors, the use of inductances to smooth the braking cycle, and the development of dynamic braking as a means of securing more rapid retardation rates and utilizing part of the energy ordinarily wasted in braking for car heating.

E. E. Soules, manager publicity department Illinois Traction system, which will be known in the future as the Illinois Terminal Railroad System, presented a number of slides illustrating a variety of advertising which is being carried on by electric railway companies throughout the country, more particularly referring to the material which is being released for local consumption. Mr. Soules stressed the importance of telling the public the story of electric railway facilities and advantages.

Summarizing the progress which has been made by his company in the development of a worm drive truck for street cars, William Bonn, railway representative of the Timken-Detroit Axle Company, pointed out that the problems encountered up to the present have been confined almost entirely to the brakes. He described how the brakes have been redesigned in a few essentials to meet the required conditions. A new shoe using a single brake block has been built and cams and leverages have been changed to use a higher air pressure. A center plate has been constructed which many operators, according to Mr. Bonn, believe has the advantages of a floating bolster and lacks its disadvantages.

The functioning of the safety council as organized in Kansas City and elsewhere was discussed in a paper by F. C. Lynch, director Kansas City Safety Council. Mr. Lynch outlined in some detail specific examples where the character of personnel on an organization so representative of strictly community interests has made it possible to secure co-operation in matters of civic welfare that could not have been obtained by more direct methods of approach on the part of the organizations concerned. Mr. Lynch divided his discussion of safety council work into two general phases, the application to the organization itself and the participation of the organization in organized safety which has to do with the public safety. This paper will be published in abstracted form in a subsequent issue of the Journal.

G. H. Roosevelt, General Electric Company, Chicago district, analyzed briefly some of the problems confronting the electric railways which must be met in effecting a substantial betterment of service. Airplanes will encourage greater speed in transportation, said Mr. Roosevelt, and the electric railways of the country must be prepared to capitalize on the advantages expected to accrue from co-operative rail and air lines. At the Monday evening banquet W. H. Manss, industrial expert Chamber of Commerce of Kansas City, was the speaker.

Election of the following officers concluded the business of the three-day meeting: President, F. G. Buffe, Kansas City Public Service; first vice-president, R. J. Lockwood, assistant general manager St. Louis Public Service Company; second vice-president, H. S. Robertson, president Denver Tramway; secretary-treasurer, J. A. Weimer, superintendent transportation Kansas City, Clay County & St. Joseph Railway; F. S. Welty, Robert P. Woods, A. R. Koonce and H. B. Cobban were elected to the executive committee, which now consists of eight men. The other four whose terms did not expire are: D. L. Fennell, B. W. Frauenthal, J. L. Adams, and A. E. Reynolds.

The program of entertainment provided by the Kansas City Public Service Company quite eclipsed all previous accomplishments in this respect and was notable for its exceptional caliber, the smoothly functioning efficiency with which it was executed, and the success with which interest and enjoyment was sustained to the very end.

Program for Coney Island Meeting

INTERESTING subjects have been selected for discussion at the annual meeting of the New York Electric Railway Association, to be held at the Half Moon Hotel, Coney Island, N. Y., June 14 and 15. The following program has just been announced:

Thursday, June 14

10:30 a.m.

Address of the President.
Report of Executive Committee.
Report of the Treasurer.
Report of Special Committees.
"Increasing the Efficiency of Passenger Transportation in City Streets," by John A. Miller, Jr., editor *Aera*, associate editor, Electric Railway Journal.
Discussion, by Hawley S. Simpson, traffic engineer Essex County, N. J., and I. C. Fox, secretary A. I. Namm & Son, Brooklyn, N. Y.
"Selection of Men as it Affects Service," by Dr. C. P. Segard, assistant secretary Third Avenue Railway System, New York, N. Y.
Discussion, by A. L. Hodges, assistant

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general manager Brooklyn City Railroad, and R. R. Hadsell, general superintendent of transportation New York State Railways, Rochester, N. Y.

AFTERNOON SESSION

"How the International Railway Company is Building Up Good Will," by B. J. Yungbluth, president International Railway, Buffalo, N. Y.

"Lack of Progress in Car Cleaning Methods," by Hugh Savage, superintendent of equipment Brooklyn City Railroad, Brooklyn, N. Y.

Informal discussion.

"Shops and Maintenance of Equipment," by Niles Persons, superintendent surface line shops, Brooklyn-Manhattan Transit Corporation, Brooklyn, N. Y.

Informal discussion.

"Shops and Maintenance of Equipment from a Manufacturer's Viewpoint," by E. C. Brandt, assistant works manager, Westinghouse Electric & Manufacturing Company, Pittsburgh, Pa.

Appointment of Committee on Nominations.

Report of Committee on Nominations.

Election of Officers.

Extensive arrangements have been made for entertainment, including special luncheons, bridge, dancing and a beach party for the ladies. There will also be an 18 hole, medal play, golf tournament at the Fox Hills Golf Club, Staten Island, on Friday, June 15. Prizes will be awarded at dinner at the Club House.

Arrangements have been made for inspection of the Coney Island Shops of the Brooklyn-Manhattan Transit Corporation at any time during the day on Friday.

Indiana Utilities Association Meets

AT THE annual general session of the Indiana Public Utilities Association, held in Indianapolis, Ind., on May 23, John B. Maling of Hammond, Ind., condemned government ownership proposals and attributed most of the agitation in Congress to representatives and senators from Western states. His subject was "Legislating the Government into Business."

Factors tending to increase popular distrust of state regulation were enumerated by Harvey Harmon, a member of the Indiana Public Service Commission, in a talk on "What Is Wrong with Regulation in Indiana?" Some of the declining confidence results, he said, from the practice of certain companies and speculative promoters in the state, the latter being particularly prominent in recent months. As evidence of the continuing attack on the commission, Mr. Harmon told how eight of the seventeen candidates for Governor in the primary campaign of the two major parties this year declared in favor either of abolishing or of radical amendment of the commission's powers. In discussing the abolition of the commission he ventured the opinion that with regulation abandoned, the financial position of interurbans and street railways would be so gravely impaired that every one would be thrown into receivership. Federal control, for which the demand is increasingly insistent, would make utilities the football of national politics, he said.

Increasing costs of rate hearings which are sustained by consumers and the failure of some companies to allocate their value to the cities they serve were mentioned by Mr. Harmon. Some phases of expert valuation by utility engineers also came under his censure.

STATE REGULATION DISAPPOINTING

Outlining some of the functions of the association, Arthur Brady, receiver and president of the Union Traction Company of Indiana, Anderson, Ind., declared in his address that state regulation had been a disappointment to the consumers from the day of its inception in Indiana, because part of the people had been led to believe that it would result in radical rate reductions. Such a hope could not have been realized even in the normal economic conditions prevailing before the World War, and after the war began reduction was more impossible than ever because of rising price levels, he said.

Mr. Brady called attention to the increasing tax burden of state utilities and said he thought the association should study the subject. Discussing the Federal Trade Commission's present investigation of the work of public utility information bureaus, he said that he had seen "nothing to indicate that such inquiry has developed facts not entirely creditable to these bureaus."

"Training of Supervisory Forces" was the subject of an address by Morse Dell Plain, vice-president of the Northern Indiana Public Service Company, Hammond, Ind. The value of organized instruction in the management of personnel was emphasized by him. "It is the object of supervisory training courses today to show executives how to be leaders rather than drivers," he said. "Every employee has the right to be well managed, and unless he is, the company and the employee both are sufferers."

At the annual banquet those at the speakers' table were Mr. Brady; W. H. Onken, Jr., editor of *Electrical World;* Charles W. Chase, president Gary Railways; Robert I. Todd, president Indianapolis Street Railway; S. E. Mulholland, vice-president Northern Indiana Public Service Company; E. Van Arsdel, president Interstate Public Service Company; C. H. Rottger, president Indiana Bell Telephone Company, and Emmett G. Ralston, vice-president Indianapolis Power & Light Company.

American Association News

Rolling Stock

THE presentation of preliminary reports by the various special committees of the rolling stock division and suggestions for additions or changes occupied the attention of the general rolling stock committee at a meeting held at association headquarters New York City, on May 4 and 5. Those present were: A. T. Clark, chairman; W. S. Adams, V. W. Berry, C. Bethel, R. S. Bull, R. W. Cost, R. A. Hutchins, J. S. McWhirter, A. D. McWhorter, H. Savage, C. W. Squier and W. T. Vivian.

To promote a broader discussion of topics of interest to rolling stock men and also perhaps to interchange maintenance and operating data the committee favored having a general meeting of the rolling stock division at least once each year. Recommendations will be made regarding this so that some plan for a proper arrangement of the meeting may be provided. The question of giving further study to paint practice, methods of painting and various color combinations was discussed. The general opinion was that this might prove a desirable subject for assignment to a special committee next year, particularly regarding methods of spray painting.

Under revision of Manual sections the question of introducing a limit for carbon content in the specifications for quenched and tempered gears was discussed. Also there appears to be a demand for an axle larger than present association standards. The design of a thicker type of brakeshoe and some questions regarding doors and end connections of freight cars were further subjects that are being considered in the revision.

Special committee No. 2 on motor coaches outlined the work being done by the committee in co-operation with other associations and committees. Special committee No. 3 on car design expects to have some information of interest on the tests of various drives for presentation in its report of progress.

A very complete report on lighting was presented by Special committee No. 4. The various subjects assigned for study were reported on and various comments and suggestions for additions and corrections were made. In discussing the use of twenty in series lamps it developed that some difficulty had been experienced from shopmen trying to interchange these lamps with standard five in series type. Those present suggested that manufacturers should contribute some means of making the new type of lamp so that it would not be interchangeable with the standard five in series type. Special committee No. 5 on bearings is obtaining information from a questionnaire. This will be analyzed for the progress report this committee will make. Committee No. 6 on lubrication will also present a progress report. Special committee No. 7 on automatic couplers has a meeting scheduled at which various points to be decided will be taken up and a preliminary report made.

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Data are being collected by special committee No. 8 on motor brushes and tests are being conducted. Special committee No. 9 on noise reduction has also been conducting tests on wheel noise and a report of the investigation will be made. Wheel welding, assigned to special committee No. 10, is receiving much attention. A large amount of data have been collected and the work is progressing but it is too soon to make definite recommendations. Special committee No. 11 on current-collecting devices presented a report and analysis of information obtained from a questionnaire, together with recommendations for trolley bases and poles. The analysis also includes information on trolley wheels. Special committee No. 13 on limits of wear is collecting information for analysis.

Education

CONVENTION activities proposed by the committee on education, as well as the final draft of the annual report, were submitted and approved at a well attended meeting of the committee in New York on June 5. This year two series of training meetings for conference leaders will be held. One will be for non-transportation men, and will be under the leadership of Frank Cushman, of the Federal Board of Vocational Training. This series of meetings will be an amplification of a similar set of meetings held during the 1927 convention under Mr. Cushman.

The second series of meetings will be conducted to develop leaders for groups in the transportation departments. William A. Durgin, Director of Public Relations of the Commonwealth Edison Company, has agreed to conduct this series of meetings. This is the first attempt to develop conference leaders of transportation men conducted on a national basis by the association.

The conference periods will be shortened and will be held only from Monday to Friday, inclusive, and will not attempt to cover the extra day, as last year.

A. J. Rowland will act as sponsor for the non-transportation group, and J. S. Hyatt in a similar capacity for the transportation men. Outlines of the two programs submitted to the committee were approved subject to such modifications as might be suggested by the conference leader.

There will be an educational luncheon conference similar to that held last year, which is being organized by C. D. Smith, of the Cleveland Railway. This luncheon conference will be open to company executives who are interested in the general question of employee education.

H. H. Fenton has written and developed a two-act playlet that dramatizes the old and the new method of dealing with accidents. An actual demonstration was given the committee during the afternoon of the meeting by employees of the Public Service Co-ordinated Transport. This dramatized so clearly the advantage of reinstruction and the different attitude of the men with the two different methods of handling serious accidents that the committee voted to have this playlet presented before the T. & T. Association. It is expected that arrangements will be made so that the same group of Public Service employees will go to Cleveland to give this demonstration.

Starting only three years ago, the progress that has taken place in developing interest in employee education has been remarkable. The committee on education, under the leadership of Edward Dana and H. H. Norris, of the Boston Elevated has been largely responsible for this accelerated progress.

An attractive series of exhibits are being arranged by several companies, actively engaged in educational work and will be displayed at the convention in an appropriate booth. The only exhibit of this kind heretofore was made in 1926. The exhibit of 1928 will contrast the work and the expansion of educational activities in the past two years.

Those in attendance at the meeting were Edward Dana, chairman; H. H. Norris, H. H. Fenton, A. J. Rowland, J. S. Hyatt, J. A. Dewhurst, A. B. Gibson, C. D. Smith, L. P. Baurhenn, Guy H. Hecker, and H. B. Potter. Managing Director L. S. Storrs attended the sessions for a short time.

Rolling Stock Committee No. 4

PRESENTATION of preliminary reports and outlining material to go into the final report constituted the business at a meeting of rolling stock committee No. 4 on lighting, held at association headquarters, New York City, May 21. Those present were: R. W. Cost, chairman, A. L. Broe, W. W. Brown, H. S. Deininger, E. E. Dorting, and H. G. Lewis.

The special committee appointed to investigate the subject of head and tail lighting requirements presented a preliminary report covering a discussion of double headlights, illumination of front dashers of cars, and a list of standard headlight lamps for electric railway service. A brief treatise on the application of stoplights to cars will be included.

A revised report on the subject of tail lights, classification lights and illuminated signs was presented. Marker lights, where operated from rail or trolley voltage, are to be included in this report. A report will be prepared on signal and emergency lights for cars and those present considered the use of signal lights desirable for one-man car operation to indicate when rear doors have been closed properly, and also for heavy traction where cars are used in train service.

Investigation as to the illumination of electric railway properties from trolley voltage has been made. Additional material is to be presented in the study of car lighting with a view to presenting improvements and economies due principally to standardization of uniform practices. A recommended practice is being developed in lamp inspection and specifications for lamps for different systems will be given. The committee is considering the advisability of having certain features on lighting exhibited at the Cleveland Convention.

Publications

MATTERS of policy pertaining to *Aera* were the principal subjects of discussion at a meeting of the committee on publications held at association headquarters on June 1. J. W. Welsh, general secretary, presented a financial statement showing that the paper is at present well within its budget allowance and may be expected to finish the current year in the same condition. Mr. Welsh also gave figures concerning circulation showing that the number of subscribers is now substantially the same as at the beginning of the year.

Careful consideration was given to a suggestion that *Aera* be mailed flat in envelopes rather than folded in wrappers as at present. It was brought out that the additional cost of mailing in envelopes would be considerable, and it was therefore decided to continue the present method.

J. H. Hanna, chairman, stated that the progress made thus far in shaping the publication to the policy decided upon by the executive committee last year had exceeded his expectations. He spoke also of the dual functions of discussing the activities of the association and of presenting material of interest and value to the rank and file of the electric railway industry. Mr. Sawyer expressed the opinion that each issue was coming nearer to the accomplishment of this purpose.

Consideration was then given to a number of specific suggestions from readers. Some of these were considered to be impracticable and were disapproved by the committee. It was decided, however, to endeavor to publish a series of inspirational articles telling about noteworthy achievements of individuals in the industry.

The possibility of making a substantial increase in the circulation of the publication was then discussed. It was the concensus of opinion that particular attention should be paid to company section activities with a view to increasing the number of company section members of the association.

The remainder of the meeting was taken up by discussion of matters pertaining to the collection and publication of statistics by the association. Generous praise was given by all the members of the committee to E. J. Murphy, chief statistician, for his work.

Those present at the meeting were: J. H. Hanna, chairman; H. V. Bozell, vice-chairman on *Aera;* F. W. Doolittle, vice-chairman on statistics; T. R. Langan, H. H. Norris, A. S. Richey, W. H. Sawyer, R. S. Tompkins, E. P. Waller, L. F. Stoll, representing Charles Gordon, L. S. Storrs, J. W. Welsh, G. C. Hecker, E. J. Murphy and J. A. Miller, Jr.

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News of the Industry

No Referendum on Eastern Massachusetts Public Control

An attempt to obtain a referendum on the bill signed by Governor Fuller of Massachusetts a short time ago to extend for five years the public control of the Eastern Massachusetts Street Railway has resulted in failure as a consequence of a ruling by Acting Attorney General F. Delano Putnam that it is an excluded matter under the initiative and referendum amendment to the Constitution. An original referendum petition, signed by ten citizens, was filed with Secretary of State Frederic W. Cook, who referred it to the attorney general's department for a ruling. In his opinion, Mr. Putnam states, it is not a proper matter for referendum, in that section 12 of the act deals with the powers of the courts, matters which are specifically excluded from the operation of the initiative and referendum.

More Moves in New York City Fare Case

Permission to bring before it additional papers and records in the New York subway fare appeal was granted by the Supreme Court of the United States on June 4. The decision was in connection with New York City's application to file further documents.

The court also definitely set Oct. 1 as the date for hearing on the appeal. The court announced that originally the case had been set tentatively for hearing on Oct. 1, ahead of seventeen other cases advanced for hearing at the beginning of the fall term.

The court's action grants the writ of certiorari filed by New York City agents to compel the Federal Statutory Court of New York to send up to the Supreme Court all the papers, documents and records in the case involving the city and the Interborough Rapid Transit Company.

Good Safety on Chicago Rapid Transit Lines

New records for safety of employees were established by the Chicago Rapid Transit Company in 1927, according to Melvin W. Bridges, safety engineer.

Employees of the Loop division led the transportation department of the "L" lines with an almost perfect record of 99.51 per cent as their safety operation average for the twelve months. During this time there was only one disabling injury to an employee and only nine days of lost time due to employee accidents. The Metropolitan division employees of this department came second with a record of 97.31 per cent safe, and the South Side division was third with a percentage of 97.30.

Mr. Bridges said that in carrying on safety work during 1927 a total of 358 meetings were held among the employees; that suggestions for raising the standard of safety on the "L" are offered and discussed by the employees, and those found worth while are used.

Wage Contract Still Under Negotiation in Toronto

After negotiations extending over a period of two weeks the Toronto Transportation Commission, Toronto, Ont., has offered to continue the contract with union platform men which expired on March 31 after being in existence for two years. The feature of the agreement presented by the union was a demand for two weeks' vacation with pay. The union took the stand that its members were civic employees and should receive a vacation without loss of wages. The offer of the commission was rejected and the union committee instructed to continue its negotiations.

Fare Question Up in Columbus

When the Council of Columbus, Ohio, considers the proposed 25-year franchise of the Columbus Railway, Power & Light Company, the fare problem may be complicated by the fact that the power franchise is held by the company as assignee of the Indianola Heating & Light Company. That grant was made on Aug. 14, 1903, and expires on Aug. 14 this year.

Hints of the need for an increase in fare first came during the franchise negotiations of the summer of 1926. An attempt was made by members of the Council at that time to combine the power rate with the railway rate in the proposed franchise. C. C. Slater, president of the company, declared at that time that if the power rate question were injected into the franchise, and the price of power lowered, it would certainly be necessary to increase fares and hinted at a 7-cent car fare. The franchise intended to apply to the railway, passed by the City Council on Sept 25, 1926, but rejected by the company, contained a provision for a 5-cent fare.

Parade of Progress in Baltimore

400 members of local Chamber of Commerce inspect railway plant and witness progress in car design, with horse car in vanguard of interesting procession

A HORSE CAR, the only relic of early transportation days now in the company's possession, trundled its way through a few Baltimore streets on April 25 in connection with a display made at Carroll Park shops for the edification of about 400 members of the Baltimore Association of Commerce, guests for the afternoon of President C. D. Emmons and the United Railways & Electric Company.

First there was a luncheon to the visiting group, members of which were carried to the shops in buses. Then came a thorough inspection of the shops and storeroom. As a finale there was a parade of street cars of various types, from the first crude conveyances to the finished products of today. The horse car served as the vanguard of this interesting procession. One of the first electric cars followed the horse-drawn vehicle after which came a series of cars showing gradual development to the day and generation of the articulated car.

When the guests reached Carroll Park they were individually greeted by A. T. Clark, superintendent of rolling stock and shops, who was aided in the reception by his assistant, H. A. Leonhauser, and other members of the shops' staff. As they entered the buildings they were welcomed by President Emmons and General Manager Potter.

A tempting luncheon was served in the carpenter shop and the inspection was then started. Special points of interest to which attention was called were all numbered, and were explained in a brochure handed to each visitor. The parade of the street cars consisted of:

Horse-drawn car, built about 1860.

Single-truck 15-ft. closed car (early electric car), built about 1890.

Single-truck 18-ft. closed car (early electric car), built about 1895.

Single-truck nine-bench open car, built about 1895.

Single-truck 20 ft. 9 in. closed car, built about 1898.

Single-truck 23 ft. closed car, built in year 1904.

Double-truck convertible car, built in year 1900.

Double-truck 28-ft. closed car, built in year 1902.

Double-truck twelve-bench open car, built in 1902.

Double-truck semi-convertible car, built in 1915.

Three car train, built in 1919.

Motor car and trailer, built in 1920.

Single-truck safety car, built in year 1920.

Single-truck safety car, reconstructed in company's shop in 1923.

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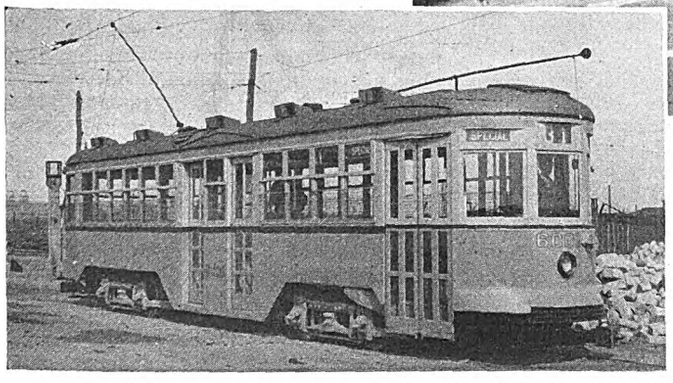
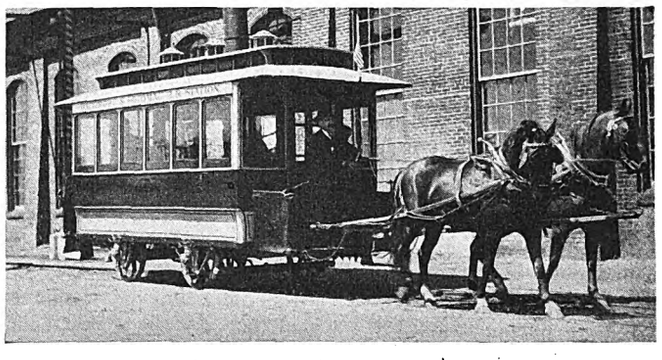
Double-truck Peter Witt car, built in 1919.

Three-truck articulated car, built in 1924.

This exhibit of car types from the beginning of railway transportation in Baltimore to the present day was presented as a climax to the inspection. In a description of the parade which he read Robert B. Varnum said there was a great deal of difficulty in getting the first car line started. The applicants for railway franchises encountered legislative opposition and opposition from merchants who contended that street cars would drive business away from their doors. Finally the needed authority was obtained. The first Baltimore horse car ran on Broadway and Baltimore Street.

The horse car in the exhibit, almost identically as it was 69 years ago, ran on Pennsylvania Avenue, from North Avenue to Baltimore Street, and thence to old President Street Station of the Pennsylvania Railroad. At hills it was met by a "hill-boy" who attached an extra horse to the vehicle to help draw it up the grade.





There was no lack of contrast in the things shown members of the Chamber of Commerce at the Baltimore inspection

Before the horse car was a dozen years old many experiments had been made to find a means of quicker propulsion of the cars. A steam dummy was tied on an East Baltimore line, but it made a great deal of noise and a great deal of smoke and it was found to have operating defects that doomed it to abandonment within a short time.

An experiment was made on the Hampden line with a third-rail electric car in 1885. The cable cars came on the scene soon after this. A dozen cable lines were built, and work was still proceeding on other lines when the overhead trolley began to demonstrate its usefulness. So at this point Mr. Varnum referred to the very earliest electric car run on a line of the Baltimore City Passenger Railway in 1891. Immediately the overhead trolley was recognized and established as practical, the attention of the railway world was concentrated upon the development of the car, the track, the overhead lines and all the accessories of service. The next car appeared on the streets of Baltimore in 1893. It was more commodious than its predecessor, about 3 ft. longer, and with correspondingly more generous space. This car was built by the Brownell Car Company, St. Louis, and operated on lines of the Baltimore Traction Company. In the same year this company began operation of a Brownell open car—a nine-bench conveyance designed for summer comfort, and one of a type that proved highly popular with riders.

Still another progressive step in car development was the introduction of the 23 ft. Brill car in 1904. In discussing this model Mr. Varnum emphasized the fact that much of the improvement in car models has been in the mechanism of the vehicles. He said it was not always possible to distinguish models by outward appearance except through the most careful scrutiny, but that motors had been constantly the object of improvement, and all else of the car that makes for smoother and more comfortable running, for speed, for acceleration, for braking, for safety, has undergone a transformation for the better.

In 1900 the Baltimore company put in operation a double-truck convertible car, possessing features which represented a great advance over previously operated cars, and destined to become the basis of a standard car that was to thrive for some time. So. Mr. Varnum went down the line of cars explaining each one briefly and adding a touch of local color here and there, until finally he came to the three-truck articulated car, pronounced by many as superior to any other style car in its fundamental features. In conclusion he said:

Our little extemporaneous "parade of the electric pony," as a newspaper man has chosen to call it, has passed. We trust it has been interesting to you. The miniature pageant has gone by with its lesson of development of car service, but the development of the car is not complete. The very best thought of the ablest engineers obtainable by this company is constantly directed toward improvements—improvements to meet traffic conditions; improvements to keep apace with the times; improvements to effect economies; but first and foremost, improvements to afford the people who ride the cars greater comfort, greater convenience, greater safety, greater satisfaction, and an altogether better service.

Parking in Downtown Philadelphia

The Philadelphia Rapid Transit Company, Philadelphia, Pa., has opened its public parking area on the south side of Locust Street, east of Fifteenth, to enable the clearing of Locust Street in the vicinity of the Mitten Building and the Mitten tours intercity terminal. Later a combined bus terminal and garage will be erected on the site.

An announcement issued by the company said:

The parking plan will not be operated for profit, since a parking fee of only 25 cents a day will be charged. Rather it will be another link in the chain of parking fields, including those at the Sixty-ninth Street and Bridge Street elevated terminals which are operated by Philadelphia Rapid Transit, as an inducement to the motorists to leave their cars outside the congested downtown areas.

R. T. Senter, president of the Philadelphia Rapid Transit Company, in discussing the parking evil, is quoted as follows:

Just as Philadelphia Rapid Transit is pointing a way to the proper method of handling the problem of bus parking by maintaining terminals on private property for its intercity buses, so we are now establishing the parking space at our expense in an effort to show the way by which the motorist who now occupies very valuable street space can be accommodated at small cost to the city as compared with the frequently suggested alternative of widening or double-decking the streets.

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Wage Agreement in Cincinnati to Go Unchanged

The wage agreement between the Cincinnati Street Railway, Cincinnati, Ohio, and its employees will not be changed this year. There is provision in the basic agreement for an adjustment every two years, to be made on July 1. In 1926 the men won a small pay increase, but this year, it is said, they do not intend to ask for any advance. The only changes to be sought will be in split runs. It is said that the men desire that when working split runs, the entire days work be completed within twelve hours. It is said that at present this spread is sometimes exceeded.

Tram Home Rule Proposed in Kansas City, Kan.

An ordinance giving Kansas City, Kan., home rule over cars operated within its limits was placed on first reading on June 4 at a meeting of the City Commissioners of Kansas City, Kan. The proposed new ordinance provides that no changes shall be made in connection with the operation of street cars without the permission and authorization of the City Commissioners. Penalty for violation of the ordinance will be a fine of not less than $5 and not more than $500.

Agreement Unchanged in East St. Louis

The wage scale and working agreement of the East St. Louis & Suburban Railway, East St. Louis, Ill., have been extended for one year. Under the contract motormen and conductors of two-man cars are paid a maximum of 59 cents and one-man car operators 64 cents an hour. The former contract with the Amalgamated expired on May 1. The men at first sought increases ranging from 11 to 21 cents an hour. Approximately 485 motormen, conductors and shopmen are employed by the company.

Survey Under Way in Louisville

J. W. Burke, traffic expert of New York formerly with J. G. White & Company, will aid the Louisville Railway and the Public Utilities Bureau, Louisville, Ky., in a survey intended to furnish suggestions for improving car and bus service. New bus routes, changes in car line routing and other matters intended to improve service will all be incorporated by Mr. Burke in his report along with the recommendations to be made by him at the conclusion of his investigations.

Among Recent Moves in Suburban New York

Supreme Court Justice Morschauser on June 1 denied the Merchants' Community Bus Transportation Company's application for an injunction against the North Street Transportation Company, a subsidiary of the Third Avenue Railway, restraining it from operating buses between Yonkers and White Plains. The Merchants' Company alleged the North Street line was infringing on an exclusive franchise.

The purchase of the Sound View Bus Transportation Company by the New York, Westchester & Boston Railway has been announced. The Sound View Company had operated 18 miles of line in Westchester. The railway, a subsidiary of the New York, New Haven & Hartford Railroad, announced it would assume control as soon as the Public Service Commission approves the purchase.

New Jersey Company's Celebration

Dinner to President McCarter one of many events in connection with corporation's 25th anniversary. Loyalty of employees fittingly recognized. Buildings decorated

MEN prominent in the public, civic, professional, business and industrial life joined in celebration of the 25th anniversary of the Public Service Corporation at the dinner at the Robert Treat Hotel, Newark, on June 1 to which reference was made in the JOURNAL for June 2, page 914.

The keynote of the speeches was co-operation between Public Service and the public, a note sounded in particular by Thomas N. McCarter, the organizer of the corporation and its president since formation. Among other things Mr. McCarter said:

> Our banner has been public service, and never have the navigators of the ship taken their eyes from that banner. Never has the banner been lowered.
>
> My enjoyment of this occasion is tempered by the mistakes we have made, for which I assume all responsibility. I have no objection to criticism. We are open to it. But our purpose has been, and always will be, to better serve the public.
>
> While it is pleasant to look back over our accomplishments, yet our eyes are fixed upon the future, not on the past. New Jersey is not in the twilight of its life. It is, rather, at its sunrise. New Jersey has just commenced to grow.
>
> We here pledge ourselves to furnish all the power needed in the state for its great future expansion, to furnish gas for all industrial and other purposes.
>
> We are doing the best we can with the local transportation problem. We have been carrying on the business below cost, lower than any place else in the country, with the unfortunate exception of New York, where the city has millions invested in transportation, with no return upon that investment.

He gave it as his belief that the transportation problem will be solved only by unified operation.

BONUS TO EMPLOYEES ANNOUNCED

Early in his address Mr. McCarter announced that the board of directors had authorized the payment of a bonus of 10 per cent of their annual salary to all employees who have been with the corporation and its subsidiary companies 25 years. There are 750 such employees.

Governor Moore, introduced as a "graduate of Public Service," paid high tribute to the genius of Mr. McCarter for his work in organizing and carrying on the corporation, for his vision and his devotion to the task he had set before him. He said:

> We in New Jersey are proud of Public Service. It is more than a corporation: It is an institution. Sometimes I think that Public Service doesn't believe we are proud of it, judging by some of the legislation and the remarks made in Trenton. To that I can only quote the Biblical line. "Whom the Lord loveth, He chasteneth."

THE NEED FOR IMAGINATION

Owen D. Young of the General Electric Company emphasized the vital part played always by imagination in the progress of mankind. "After all," he said, "imagination is the leadership of the world." And he went on to tell how every accomplishment of man, every "line drawn in the map of the world," first lived in imagination, then became reality through the courage and self-sacrifice of man.

Arthur W. Thompson, president of the United Gas Improvement Company, stressed the theme that the 25th anniversary of the company was more than a celebration of a mile post in the life of a corporation. He said:

> Behind the corporation are the men and I believe it is to them that we here tonight pay tribute. We are celebrating their accomplishment, not merely a corporation anniversary.

In lauding the work of the early builders of the corporation E. W. Wakelee paid particular tribute to Mr. McCarter. Mr. Wakelee said:

> I believe Mr. McCarter will go down in history as one of the greatest builders New Jersey has ever had.

He emphasized the need for still greater co-operation between the corporation and the public and officials.

Some interesting sidelights on public utility operation in the early eighties developed during the evening. It was recalled that it was in New Jersey that Thomas A. Edison achieved a great deal of his success and as early as 1880 was operating a commercial electric railway at Menlo Park, though it was not until some few years later that electric cars began to displace the horse and cable cars. On May 9, 1881, the Common Council of Newark authorized the expenditure of "not less than $300 for the purpose of erecting five suitable posts in Military Park and running a wire upon the same, provided the Weston Electric Lighting Company will burn five lights until midnight without charge for lighting, furnishing attendance, electricity, etc., at their own expense." Since the organization of Public Service the cor-

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poration has spent $162,000,000 for electric properties and improvements, while total expenditure for all properties amounted to $295,000,000.

Among those who attended the dinner were:

P. S. Arkwright, E. A. Armstrong, Joseph F. Autenrieth.

A. E. Bauhan, Louis P. Baurhenn, H. F. Bell, H. A. Benedict, John Bentley, R. O Bentley, Frank Bergen, Colonel Charles N. Black, Samuel T. Bodine, William W. Bodine, Newton W. Bolen, M. R. Boylan, Luke C. Bradley, W. J. Brennan, Emmett A. Bristor, H. W. Buck.

N. A. Carle, Ralph S. Child, Paul S. Clapp, Harlow C. Clark, S. H. Cleeland, Jr., B. C. Cobb, William I. Cooper.

Richard E. Danforth, Harry V. Drown.

Edward H. Earnshaw, Senator Edward I. Edwards, VanHorn Ely.

B. C. Forbes, Harry K. Ford, Carl T. Freggens.

Gen. Frederick Gilkyson, A. S. Grenier.

J. Horace Harding, W. B. Hartshorne, William C. Heppenheimer, H. T. Herr, Garret A. Hobart, J. H. Hanna.

T. A. Kenney, Col. Anthony R. Kuser, John L. Kuser.

Horatio G. Lloyd, James P. Logan, F. A. Lydecker, Adrian Lyon.

Thomas N. McCarter, Thomas N. McCarter, Jr., Uzal H. McCarter, Uzal H. McCarter II, James H. McGraw, William H. Meadowcroft, A. C. Middleton, J. F. Mitchell, Governor A. Harry Moore, Clinton E. Morgan, John F. Murray, Jr.

Arthur E. Newbold.

Matthew L. O'Brien, W. H. Onken, Jr., F. S. Osborne, Farley Osgood, J. L. O'Toole.

John H. Pardee, Arthur N. Pierson, P. W. Pierson.

J. S. Rippel, David B. Robb, Dwight P. Robinson.

W. H. Sawyer, Martin Schreiber, George S. Silzer, George T. Smith, William R. Smith, Frank H. Sommer, Thomas Sproule, L. S. Storrs, Edward T. Stotesbury.

William H. Taylor, Arthur W. Thompson, Paul Thompson, C. L. S. Tingley, R. S. Tomkins.

T. W. VanMiddlesworth.

Edmund W. Wakelee, John I. Waterbury, E. F. Weston, Arthur Williams.

Owen D. Young, Percy S. Young.

John E. Zimmerman.

The dinner was, of course, the culminating feature of the celebration. But it was, after all, only one event in a series which marked the anniversary. A new motion picture entitled, "The Public Servant of a Great State," setting forth the activities of Public Service companies, is being shown in several cities in Public Service territory.

The growth and development of the Public Service transportation system, especially in the field of the bus, has been graphically illustrated by pictures of deluxe bus operation, as well as the plant and equipment necessary to maintain and operate the fleet of more than 1,200 buses.

In honor of the anniversary many of the Public Service buildings will be decorated, for the entire month. The commercial office windows will contain appropriate displays for about two weeks. The decorations will include flags and bunting, and six of the commercial office buildings will have an electric sign reading "1903-1928." Floodlights will be used to illuminate the exteriors of some of the buildings at night.

The story of the growth of the company is told in the 60-page illustrated booklet "Public Service Review 1928—25 Years of Public Service."

N.E.L.A. Meeting

Industry moving forward rapidly. Market development effort bearing fruit. Puget Sound wins Coffin award

WITH customary enthusiasm and purpose the 51st convention of the National Electric Light Association was held at Atlantic City, N. J., June 4 to June 8 with 8,000 utility representatives at the meetings. From the speeches and papers it was generally conceded that the electric light and power industry was moving forward rapidly; that market development efforts were bearing fruit; that closer co-operation was evident between the national associations in the industry; that public understanding was a big problem and that undivided executive attention was necessary for successful public relations. An announcement that the industry had contributed $3,000,000 to the National Research Council program was evidence of the co-operation given for the public benefit.

P. S. Arkwright succeeds H. T. Sands as president and J. F. Owens and A. W. Thompson were elected vice-presidents. M. S. Sloan and W. A. Jones continue as vice-presidents and P. S. Young continues as treasurer.

An address by James H. McGraw entitled "The Power Industry in the Marketplace" referred to the new competition which is teaching the public to discriminate, not necessarily as to what may be best in the absolute sense, but as to what is most desirable. He stressed the need of direct appeal and of advertising messages that would arouse the general public.

An enlightening message on "Railroad Electrification" was given by Britton I. Budd, chairman of the committee on electrification of steam railroads. He summarized conditions in Europe and America, referring to the accomplishments and plans of such properties as the Chicago, Milwaukee & St. Paul, the Illinois Central, the Virginian Railway, the Pennsylvania Railroad, the Great Northern, the Philadelphia & Reading and the Delaware, Lackawanna & Western. These plans were all projected to increase capacity, to improve service and to promote general economy.

A high spot in the speech of J. F. Owens, chairman of the public relations committee, National Section, was touched when he said that rendering a service was only half the job; that it was necessary to disseminate information so as to enable the recipient of the service to use that service wisely and well. He stressed the necessity for the use of paid advertising columns in the press to give to the public "a straightforward, well thought-out and carefully prepared account of stewardship."

The Coffin Award for 1928 went to the Puget Sound Power & Light Company.

Would Prepare Sound Program for Chicago

Expressing impatience with the long delays and with the obstructions placed in the path of settlement of the Chicago railway problem by various political interests, members of the local transportation committee of the City Council have adopted a resolution which calls for the immediate preparation of a sound railway program regardless of the attitude or opinions of the transportation companies or of interested political factions. Alderman D. S. McKinlay, author of the resolution, held that the prospect of obtaining the legislation necessary to put in effect the five recent railway bills seemed indefinitely lost as a result of the failure of the special legislative session held last month to take action, and urged that a definite plan be formulated by the committee and submitted to the voters without further appeal to the Legislature. The following program is suggested:

That the committee take up with the Chicago Surface Lines the matter of renewing the 1907 ordinance with such changes, including unification of service with the Chicago Rapid Transit Lines, and if possible, an amortization provision, as may be deemed desirable.

That the committee negotiate with the Rapid Transit Company for the granting of a definite term franchise, not to exceed 40 years, such franchise also to include unification of service with the surface lines, and if possible, an amortization provision. Finally, in the event the companies fail to agree on terms for unification of service, then the attorneys for the committee shall be directed to proceed before such regulatory commission, local or state, as then shall have jurisdiction, to compel the transportation utilities to provide unified service to Chicago on such terms as such commission may determine are just.

Should the railways persist in their unwillingness to accept a settlement as devised by the committee, the aldermen intimated that they would turn to the alternative Lisman plan, which has been pending in Council for nearly eighteen months. It is believed that action by the State Legislature would not be required to put this plan into effect.

Skip-Stop Plan in Indianapolis Postponed

Action on the proposed skip-stop system for one of the principal city car lines of the Indianapolis Street Railway has been postponed by the Indianapolis, Ind., Board of Public Works pending completion by the city legal department of a formal opinion that the works board has jurisdiction to regulate the schedule. The proposed schedule, drafted by attorneys for patrons, provides that cars stop at every third intersection. Cars would be marked with a red diamond, a green oblong, and a black circle to indicate stopping corners. It is contended that during the busy hours, a considerable saving of time would result if this plan were followed.

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Milwaukee Program Being Expedited

Operation will be begun soon by the Milwaukee Electric Railway & Light Company, Milwaukee, Wis., over new tracks from Soldiers Home to 68th Street, on the west side of Milwaukee. At this point the company is relocating slightly more than a mile of track, moving it from Fairview Avenue to private right-of-way free from grade crossings. Four tracks are to be provided, two for rapid transit trains operating to Watertown, Burlington and East Troy, and the other two for Wells-West Allis suburban cars.

Later in June the company expects to begin operation of its Racine-Kenosha interurban trains over 9 miles of new track immediately south of the city of Milwaukee. The new track is entirely on private right-of-way and is substantially free from grade crossings. It will make high-speed operation possible and insure more satisfactory maintenance of schedules than the present route, which is located almost exclusively along heavily traveled public streets and highways.

The Milwaukee Common Council has acted favorably upon the company's franchise application for a subway and rapid transit outlet toward the west. Some further preliminary steps need to be taken, but the company is hopeful of being able to begin physical work on this improvement this year.

Wage Renewal Suggestion Rejected in Connecticut

Employees of the Connecticut Company have rejected the proposal of the company to renew the present wage schedule, which expired on June 1. It is known that the employees are taking their stand for increased wages on the grounds that Massachusetts companies controlled by the New Haven road pay a higher rate with an eight-hour minimum day. Carhouse hands, shopmen and other workmen, all designated as non-uniform employees, who are members of the Amalgamated Association, also are seeking increases. President John K. Punderford of the Connecticut Company, referring to the result of the voting, said it was probable that officials of the company and representatives of the employees would confer at once with the hope of settling the problem without arbitration.

Free Rides in Michigan City

Free street car and bus rides for everyone was a feature of the city-wide bargain day sponsored on May 22 by the Chamber of Commerce of Michigan City, Ind. Through the efforts of the local retail board of the chamber, all passengers on the cars of the Chicago, South Bend & Northern Indiana Railway and on the buses of the Jahn's Bus Line and Shore Line Motor Coach Company were carried free between 9 a. m. and 4 p. m. Practically every retail store in Michigan City advertised special low values on their goods and urged their patrons to take advantage of the free transportation service on that day.

Car Ordinance Given Columbus Company

A certified copy of legislation passed by the City Council of Columbus, Ohio, making all streets with car tracks main thoroughfares and establishing a speed limit of 25 m.p.h., for street cars, has been forwarded to the Columbus Railway, Power & Light Company by City Clerk Wilkins. Work on the establishment of the skip-stop system will not be started until acceptance of the main thoroughfare ordinance by the railway.

New Fares in Lawrence

A new schedule of railway and bus fares for Lawrence, Kan., was approved recently by the Public Service Commission. The approved schedule is one fare for 10 cents and two for 15 cents with free transfers between the two classes of transportation. The operating company is the Kansas City, Kaw Valley & Western Railway.

Franchise Ordinance for Toledo Approved

By a vote of seventeen to one with two absentees the City Council of Toledo, Ohio, approved the plan of railway settlement presented to it by Mayor William T. Jackson two weeks ago and formulated along the lines of agreement worked out by Commissioner E. L. Graumlich and the Street Railway Board of Control in negotiations covering several months. After considerable study the plan was endorsed unanimously by the railroads and telegraphs committee of City Council. It had unanimous indorsement and support of the Chamber of Commerce, and it was approved by the city commission on publicity and efficiency. The ordinance will become effective in 30 days provided it is not subject to a referendum vote.

Business leaders consider the plan the most forward-looking step in transit development undertaken in Toledo since the Milner plan was launched more than six years ago. The present ordinance appears to have corrected most of the former troubles without committing the city up to a transit monopoly for a long period of years. Extensive repaving of streets and development of new home districts will be undertaken as a result of the passage of the new transit plan, it is believed.

The new plan is a supplementary agreement between the city and Community Traction Company. Details were given in the ELECTRIC RAILWAY JOURNAL issue of May 12. Adequate guarantees to both interests are set up in the ordinance. The entire plan is based on a five-year period.

Recess Appointment for P. J. Farrell

The United States Senate failed to act upon the nomination of Patrick J. Farrell to become a member of the Interstate Commerce Commission to succeed John J. Esch of Wisconsin, but he was given a recess appointment by President Coolidge on June 7. This appointment will fill the gap in the commission's ranks.

Date Set for Hearing on Rome Fare Request

June 12 has been set by the Georgia Public Service Commission as the date for hearing the plea of the Rome Railway & Light Company, owned by the Georgia Power Company, for an 8-cent cash fare instead of the 6-cent fare now in effect; to sell two tickets for 15 cents, and to establish a 4-cent fare for school children instead of the present 3-cent fare.

Hearing in Hamilton on June 12

The application of the Hamilton Street Railway, Hamilton, Ont., to increase its fare and that of the men to win a wage advance will be brought before the Ontario Railway and Municipal Board on June 12. This decision was made on May 21, when the board sat to hear evidence in the application of the railway men for a wage increase. C. R. McKeon, chairman of the board, said that while the board could give no decision until it heard the evidence, any action favorable to the men's application would depend largely upon the company's ability to pay increased wages. Any decision by the board will be retroactive to May 1.

Endeavor to Fix Blame in Illinois Wreck

Three separate investigations are being conducted to fix responsibility for the collision of two trains of the Illinois Traction System near Danville, Ill., on May 31, which resulted in the death of seven persons and serious injuries to 29 others. Both cars were limiteds of semi-steel construction. The wreck occurred about 700 ft. east of the siding and approximately in the middle of the 2-mile stretch of tangent track. The scene of the wreck is at Fithian, 7 miles west of Danville, Ill.

Would Operate One-Man Cars on Fort Wayne Line

Permission to operate one-man cars on its lines between Fort Wayne and Garrett, Garrett to Kendallville and Garrett to Waterloo was asked in a petition filed recently with the Indiana Public Service Commission by the Indiana Service Corporation, Fort Wayne. The petition sets out that receipts have been steadily decreasing for the past year.

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Recent Bus Developments

Business Men Headed by Railway President Buy Cincinnati Taxis

Negotiations for the purchase of the Zumstein and the Town Taxicab Companies by a group of business men represented by Walter A. Draper, president of the Cincinnati Street Railway, have been consummated. The two taxicab properties will be merged and operated as one concern by a new company. Mr. Draper said:

A group of Cincinnati business men has completed an agreement to purchase the Zumstein Taxicab Company and the Town Taxi Company, Inc. A new company will be formed to take over the business of both companies. It is expected the details will be worked out within the next two or three weeks.

Both Frank J. Zumstein and Joseph Erman will be identified with the new company, Mr. Zumstein as a vice-president and Mr. Erman as a vice-president and general manager. The other officers of the company have not as yet been selected.

These two taxicab companies are being brought together as a step toward improving the taxicab situation in Cincinnati. While in some cities taxicabs are operated by companies that run the railway and the motor coaches, it has not been thought wise at this time to include the taxicab business as a part of the Cincinnati Street Railway. The taxis will be operated as a separate and distinct unit, with no connection with railway business.

The company's policy will be to improve the service and as far as possible to help in improving the taxicab situation as a whole. Further announcements will be made later of steps to be taken to accomplish this purpose.

One-Year Consent Granted International

Although it rejected the application of the International Railway, Buffalo, N. Y., for a ten-year consent to operate buses over Bailey and Kensington Avenues at a 10-cent fare the legislative committee of the Common Council has agreed to a consent for a one-year period. Under the proposed consent, the rate of fare will be 10 cents for all passengers who occupy seats, including children, but the transfer restrictions applying to the Delaware and Delevan bus lines, on which only one transfer is issued, do not apply.

Walter C. McCausland, public relations officer of the company, who represented the company at the hearing, said the proposed consent would be taken under advisement. He said the company was desirous of a ten-year consent.

The International now is running a bus over Bailey Avenue from Broadway to the north city line. It has no franchise. The rate of fare is a regular trolley token and unlimited transfer privileges extend to intersecting trolley lines.

In voting this agreement, which was not made unanimously, the committee indicated that while it was not in agreement with all the terms of the proposed franchise, it felt it should heed the petition of residents in the Kensington-Bailey section who are asking for additional transportation facilities.

Modern Bus Station Open at Oklahoma City

A new bus station, in many respects modeled after a modern electric railway depot, was opened at Oklahoma City, Okla., on June 4. It is located near the Santa Fe Railway station and is 100x140 ft. in dimensions. It contains an information bureau, a central ticket window, issuing tickets for all lines operating out of the station, and a spacious waiting room. Ninety buses will arrive at or leave the station daily.

Extensions in Washington

Permission has been granted to the Washington Railway & Electric Company to extend its Rhode Island Avenue bus line from Fourth and Franklin Streets, N.E., to the intersection of Queens Chapel Road, Washington, D. C. The commission ruled that the extension would provide additional service to residents along the proposed route. No changes were made in either the rate of fare or transfer privileges now in effect. The company was also authoried to extend its Park Road bus line by changing the route of this line and dividing it into two branches.

New Service in Iowa Awaited

Bus service will be started by the Waterloo, Cedar Falls & Northern Railway, between Waterloo and Cedar Rapids, Ia., June 15, according to a recent announcement of Maurice Welsh, superintendent. One round trip daily is scheduled for the opening of the service, giving the only morning connection between the two cities

Controversy About Leased Buses

Conflict arises over arrangement by which Detroit Municipal leases equipment. Auditor removed for remarks made without commission's approval

WILLIAM M. HAUSER was removed as auditor of the Department of Street Railways, Detroit, Mich., on May 31 at a special meeting of the Street Railway Commission. His dismissal had the approval of the Mayor. G. Ogden Ellis, president of the commission, stated that the meeting was called to consider a public statement by Mr. Hauser in which the auditor criticized W. B. Mayo, a former member of the commission and now its consulting engineer. The commission regarded Mr. Hauser's statement an insult to Mr. Mayo.

Mr. Hauser was appointed auditor about three years ago to succeed I. N. Merritt during the time John W. Smith was Mayor and shortly after Col. H. U. Wallace was made general manager of the Detroit municipal system. No action has been taken to fill the position. In the meantime Charles J. Faber, chief assistant auditor, will have charge of the auditor's office.

In the interview Mr. Hauser was quoted as including the statement that Mr. Mayo was "a pensioner of Henry Ford" and "an interested party" in the controversy over the rental of buses by the D.S.R. from the Detroit Motorbus Company, of which Mr. Mayo is an officer. Mr. Hauser was quoted as saying that Mr. Mayo's name is printed on the railway department's letter head and that it also appears on that of the Detroit Motor Bus Company, but does not appear on the Ford stationery.

When the matter of the purchase of new buses by the D.S.R. came up several weeks ago, the propriety of purchasing new equipment of that nature was questioned and Mayor Lodge and the commission asked Mr. Mayo to study the department's bus situation and report on the operating costs. Mr. Hauser questioned the matter of considering Mr. Mayo's report "the last word on the subject, particularly when he is first vice-president of the interested company." This refers to the fact that the Department of Street Railways is renting buses from the Detroit Motorbus Company. Mr. Houser and Commissioner Barlum were opposed to renting the equipment from the private company and at a recent meeting Mr. Barlum stated that as Mr. Mayo's report of his bus survey was announced as soon forthcoming, he would withhold a motion to purchase new buses.

About a week previous to his dismissal, the auditor stated that in the 10 months ended April 30, 1928, the D.S.R. had paid $228,000 for rental of buses. Although Commissioner Barlum and Mr. Hauser agreed in the contention that the rental was inadvisable, the motion to dismiss Mr. Hauser was made by Mr. Barlum. Mayor Lodge stated that the bus rental arrangement was O.K.'d by the Street Railway Commission and approved by the Council and the Mayor last July. The Mayor added that Mr. Hauser was discharged for insubordination. His statement also pointed out that "I do not like these rows; I do not like friction in our City

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departments, but I must take action in a case of this kind or we can have no morale in the administration of city affairs."

MR. HAUSER'S EXPLANATION

Following his dismissal, Mr. Hauser issued a written statement in which he is quoted as follows:

I have given my very best in an endeavor to make public ownership of Detroit's street railways a success. My files will show that I have tried to give the chief executives of the Street Railway Commission the facts about the operation of the people's transportation system. I have endeavored to do this honestly without fear or favor, and have been very careful of the trust imposed on me. I feel that a man in public office owes his loyalty first to the entire people, and in this respect my conscience is clear.

There are many ramifications to the relations of the Detroit Motor Bus Company with the Department of Street Railways which undoubtedly will in time come to light and in the end my action will be appreciated.

These are my own personal opinions. Others may have different ones, but I stand on what I think and what I believe to be right.

The story of the success of the Detroit Motor Bus Company in the last few months can in part—in a very large part—be attributed to the contractural relations it has with the Department of Street Railways with respect to rented coaches.

I accept the result of the expression of my honest conviction very cheerfully since I have stood for what is right and not what some other man thinks is right.

Mr. Hauser said that the statement referring to Mr. Mayo as a pensioner of Henry Ford should not have been published, but insisted that he would stand by his contention that it was not proper for Mr. Mayo, an officer of the Detroit Motor Bus Company, to make a report as consulting engineer for the D.S.R. He held to the belief that no man is big enough to sit on both sides of the table at the same time.

BUS INDUSTRY IN TRANSITORY STATE

Del A. Smith, general manager of the Detroit Municipal Railway, was quoted in part as follows:

The bus industry is in a highly transitory state. It is only within the past year that a satisfactory bus carrying 35 to 60 passengers has been developed. The efficient 40-passenger bus has come only in the last 10 months, and the day of the double-deck bus is distinctly done. We could not foresee the development of one type and the obsolescense of the other a year ago.

Had we purchased buses then, we would have acquired a fleet which by now would be antiquated and rendering service unsatisfactory in comparison with machines we can buy now. As to Mr. Hauser's statement that the Detroit Motor Bus Company is making 10 cents a mile, the idea is ridiculous. We rent the buses for 31 cents and it is impossible to operate buses such as the motor bus company leased to us for anything like 21 cents.

They make a small margin of profit, but that small margin is all the city is losing —and it certainly is not 10 cents for every mile the rented buses travel. Further, we were justified in renting new buses to avoid delay in opening new territory. Fourteenth Street was promised service for two years before it got it. Now we are hauling slightly less than 3,000 passengers a day over that route and could haul more if we had bigger buses.

Rented buses now run about 20,000 miles a month compared with 30,000 when rented buses were run by the Municipal on Fourteenth Street.

Bus Patronage Satisfactory in Kansas City

Buses operated by the Kansas City Public Service Company, with a new grant of 15-cent bus fares on trunk lines, apparently are holding the patronage enjoyed when a 10-cent fare was asked, according to a check made by the company during the rush periods. The patronage is about as usual, according to D. L. Fennell, superintendent of transportation of the company. The double-deck buses did a light business the first few days, says Mr. Fennell, because the weather was not suitable for outside riding, but on the whole there was no indication the patrons considered the 15-cent fare too high. Of the new routes the South Oak line seemed popular. The trunk line passengers, beginning with the new six months' temporary franchise, can obtain free transfers to certain intersecting street car lines. Feeder line fares remain 10 cents.

Complaint Against Gary Railway Operation

The Midwest Motor Coach Company, Gary, Ind., in a petition filed recently with the Indiana Public Service Commission asked that the Shore Line Motor Coach Company and the Gary Railways be ordered to cease operating motor coach routes in competition with its own coaches between Gary and 63rd Street, Chicago. It was the complainant's contention that it had been authorized by the commission in October, 1925, to operate a motor coach route between these two points and that the other two companies held certificates permitting them to operate only over that part of the route between Indiana Harbor and Whiting, but that both companies were now carrying passengers over the entire route. The petition asks that the certificates granted them by the commission be withdrawn and that they be ordered to desist.

An injunction sought by the Midwest Motor Coach Company to restrain the Shore Line Motor Coach Company from operating buses over this route was denied last February by the Porter County Superior Court at Valparaiso, Ind.

Service Sought in Indiana City

In a petition filed recently with the Indiana Public Service Commission, it was requested by residents of Fairmount, Ind., that the Union Traction Company of Indiana be compelled to provide bus service for that city, as required in the certificate of convenience and necessity granted by the commission.

Petitions for Westchester Heard

An attempt to induce the City Council of New Rochelle, N. Y., to reconsider the proposal of the Third Avenue Railway, New York, to substitute buses for trolley cars over the East Main Street line under the conditions requested by the railway failed recently, when the Councilmen refused to put the suggestion for reconsideration into the form of a motion.

The Public Service Commission has approved the tariff filed by the Westchester Street Transportation Company, Inc., a subsidiary of the Third Avenue Railway, for bus operation in place of cars upon its Silver Lake line in White Plains and Harrison. Subroute or short line buses are operated over carrying portions of the route to meet requirements of traffic. Fare on this line is 10 cents. Free transfers are given from this line to other bus lines or street car lines entitling the passenger to ride to any point in the city of White Plains.

Eight Motor Coach Routes in Pasadena

The California Railroad Commission has granted a certificate to the Pacific Electric Railway for the operation of coaches in the city of Pasadena over eight routes, covering its present operations. These routes are to be considered as experimental, however, and subject to any further order by the commission in case corrections or alterations may be required.

Municipal Bus Lines Do Well. Pass Popular in St. Petersburg

According to the *Times*, St. Petersburg, Fla., that city's municipal bus lines, started on June 5, 1926, have solved the transportation problems of thousands of residents in the outlying sections of the city, particularly in the Haines Road district, north and south Disston Boulevard, along Lakeview Avenue and in the Lakewood Estates section. This same authority says that the lines were operated at a loss for several months, but are slowly becoming self-supporting. Since the lines were started eight city buses have carried 840,048 passengers and collected $82,519 in passenger fares. The system now covers a wide section of the city not reached by the municipal railway.

Bus transportation is said to have been made more popular by the public utilities department through the sales of two classes of tickets, one form interchangeable with the street cars and the other a straight weekly pass good only on the street cars. The combination weekly pass good on both the car and bus sells for $1.75. The straight weekly pass selling for $1 entitles the holder to ride only the street cars. Since the weekly pass system was put into effect the railway has shown an increase in sales from about $500 the first week to more than $1,100 a week at the present time.

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Financial and Corporate

Reorganization of Michigan Electric Railway

Formation of a plan and agreement for the reorganization of the Michigan Electric Railway, Jackson, Mich., and its properties has been adopted by the bondholders' committee. Any depositor who may dissent to the plan, should it be approved, will receive bonds and coupons represented by his certificate of deposit upon payment of an amount to cover pro rata share of cost and expenses fixed by the committee, not exceeding $15 for each $1,000 bond.

The plan provides for the organization of a new company and the necessary subsidiaries to acquire the present company's property and operate such additions, extensions and betterments as it may find necessary. No stock or securities will be issued for or on account of the outstanding stock of the company. The new company will not issue or sell any notes, bonds, or other obligations except for money necessary to pay expenses.

Holders of first and refunding mortgage bonds will receive for each $100 principal amount of bonds one share of stock in the new company. Holders of Jackson & Battle Creek Traction Company bonds will receive a like amount for each $100 principal amount of bonds, and holders of Jackson Consolidated Traction Company bonds will receive a similar distribution.

St. Louis Formally Discharges Receiver

Rolla Wells was formally dismissed from his duties as receiver for the United Railways by United States District Judge Faris on May 28. The ending of his tenure of office was on his own application and after his final reports had been approved by the court. He entered on his task in April, 1919. The St. Louis Public Service Company took over the railway on Dec. 1, 1927, following the sale of the property under foreclosure.

German Issue Offered in American Market

An $8,000,000 ten-year 5½ per cent gold loan for the Hamburg Elevated, Underground & Street Railway, Hamburg, Germany, is being offered by Brown Brothers & Company, the International Acceptance Bank, Inc., and the Illinois Merchants Trust Company at 92½, to yield 6.33 per cent. Proceeds will be used to refund a $6,000,000 short-term loan and to provide for improvements and extensions to the property. The company owns and operates all elevated, underground and railway systems, as well as ferry and bus services, in Hamburg, serving a population of about 1,500,000. Net earnings of the company in 1927 and for the past four years, after all charges and depreciation, were about 3¼ times annual interest requirements on this loan.

Suit to Prevent Washington Merger Dismissed

Justice Peyton Gordon in Equity Division 2 on June 1 sustained the motion of the Washington Railway & Electric Company, Washington, D. C., to dismiss the suit for injunction brought by John J. Noonan, minority stockholder of the company, against the North American Company and the local company to prevent the suggested merger of the railway lines of the company with the Capital Traction Company and the Washington Rapid Transt Company. Attorneys William G. Johnson and Joseph D. Sullivan, counsel for Mr. Noonan, gave notice of intention to appeal when the formal order of dismissal has been signed.

Smaller Milwaukee Property Merged

The Milwaukee Northern Railway, operating a city car line in Milwaukee, Wis., and an interurban railway between Milwaukee and Sheboygan, was merged with the Milwaukee Electric Railway & Light Company on April 30, 1928. This merger is primarily a consolidation of the properties, with the smaller losing its corporate identity. The Milwaukee Northern, with assets of $4,450,000, had been controlled and operated by the Milwaukee Electric Railway & Light Company for several years as a subsidiary.

Analysis of Operating Statements

Railway association statistician comments on returns of companies 1927 as shown in detailed compilation for *Aera*. Figures summarized for presentation by Journal

IN *Aera* for May there was given a summary of the operations in 1927 of a group of 206 electric railways divided among city lines, interurban lines and combination city and interurban lines. In the June issue of that paper the companies in each of the three groups, comprising city, interurban and combination city and interurban lines, are each further subdivided into three smaller groups, the first consisting of so-called Class A companies whose annual revenues exceed $1,000,000 a year, the second consisting of companies whose annual revenues amount to more than $250,000 and less than $1,000,000, and the third consisting of companies earning less than $250,000 a year. In addition there is also given a combined comparative balance sheet and income statement of 161 companies. This group is then subdivided into city, interurban and combination city and interurban companies and a combined comparative balance sheet and income statement is given for each group.

Edmund J. Murphy, chief statistician of the American Electric Railway Association and author of the article, says that when the companies are segregated into classes according to their size it at once becomes apparent that the large companies are in the strongest position and make much the best showing. This is true in the case of all three classes of companies, but in the case of the city lines the companies in the medium sized group, that is, those companies earning between $250,000 and $1,000,000 a year, make almost as good a showing as the larger companies earning more than $1,000,000 a year. This is due largely to the fact that the medium sized companies succeeded in making a very material deduction—13.24 per cent—in their deductions or fixed charges, consisting principally of rentals and interest on bonded indebtedness.

The traffic on the large city lines was practically the same in 1927 as in 1926, there being a decrease of only 0.01 per cent. Traffic on the medium sized lines, on the other hand, decreased 1.32 per cent. The operating revenues of the two groups followed practically the same trend, there being a decrease of 0.83 per cent in the case of the Class A companies and a decrease of 1.07 per cent in the case of the Class B companies.

When the interurban lines are considered it is found that the difference in the showing made by the small companies and the large companies is more sharply drawn than in the city group. Among the interurban companies apparently the smaller the company the more difficult it finds it to operate successfully, and this is not unnatural, for as was pointed out in ELECTRIC RAILWAY JOURNAL for May 5, in which Mr. Murphy's previous article was reviewed, in the smaller communities and outlying districts the private automobile has become a family necessity and is used more universally and more intensively than in the larger centers of population.

Further evidence that the large interurbans were developing their freight business is shown by the car-mile figures. While the number of passenger

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Statistics Compiled by American Electric Railway Association

ANALYSIS OF INCOME STATEMENT, SHOWING PER CENT OF INCREASE OR (D) DECREASE

	City Companies			Interurban Companies			Combined Properties		
	42 Cos. with Revenues of More than $1,000,000 a Year Each	23 City Cos. with Revenues of $250,000 to $1,000,000 a Year Each	14 Cos. with Revenues of Less than $250,000 a Year Each	3 Interurban Cos. with Revenues of More than $1,000,000 a Year Each	21 Interurban Cos. with Revenues of $250,000 to $1,000,000 a Year Each	26 Interurban Cos. with Revenues Less than $250,000 a Year Each	34 Cos. with Revenues of More than $1,000,000 a Year Each	23 Cos. with Revenues of $250,000 to $1,000,000 a Year Each	20 Cos. with Revenues Less than $250,000 a Year Each
Railway operating revenue	(D) 0.83	(D) 1.07	(D) 2.64	0.14	(D) 4.40	(D) 3.63	(D) 3.51	(D) 4.48	(D) 10.76
Railway operating expense	(D) 1.66	(D) 0.83	(D) 1.84	1.21	(D) 1.89	(D) 0.49	(D) 2.10	(D) 2.58	(D) 5.01
Net operating revenue	1.22	(D) 1.84	(D) 5.31	(D) 5.32	(D) 17.90	(D) 21.49	(D) 8.40	(D) 13.05	(D) 59.59
Net revenue: Auxiliary operations	33.10	.....	39.82	11.47	(D) 19.50	(D) 90.18	7.41	(D) 7.53	(D) 9.52
Taxes	(D) 0.35	4.20	(D) 10.90	3.31	(D) 5.71	(D) 14.51	(D) 5.90	(D) 6.58	(D) 1.25
Operating income	1.87	(D) 4.00	(D) 3.66	(D) 5.36	(D) 24.94	(D) 29.07	(D) 8.24	(D) 16.39	(D) 76.49
Non-operating income	10.57	(D) 3.03	(D) 16.15	(D) 2.90	12.36	(D) 8.71	(D) 3.52	41.77	(D) 6.80
Gross income	2.40	(D) 3.97	(D) 4.75	(D) 4.94	(D) 17.28	(D) 27.47	(D) 7.76	1.93	(D) 71.67
Deductions from gross income	1.07	(D) 13.24	(D) 11.93	(D) 4.05	2.38	(D) 13.83	1.41	(D) 12.16	(D) 2.52
Net income	7.37	9.53	.....	.....	.....	.....	(D) 74.06	.....	.....
Dividends	(D) 0.48	30.23	.....	.....	(D) 4.34	.....	(D) 2.38	154.63	(D) 2.29
Operating ratio (per cent)	0.83	0.25	0.83	1.06	2.62	3.25	1.45	1.97	6.43
Ratio: Net income to operating revenue	8.33	10.61	.....	.....	.....	.....	(D) 73.08	.....	.....

OPERATING EXPENSES BY PRIMARY ACCOUNTS—PER CENT INCREASE OR (D) DECREASE

	City Companies			Interurban Companies			Combined Properties		
Way and structures	(D) 5.25	3.53	7.54	6.25	(D) 0.19	7.60	(D) 2.43	5.52	(D) 3.31
Equipment	(D) 1.53	1.78	(D) 6.64	(D) 1.61	0.48	1.71	2.75	(D) 7.09	6.89
Power	(D) 1.73	(D) 4.93	(D) 2.03	0.57	(D) 8.96	(D) 5.19	(D) 4.40	(D) 2.89	(D) 8.76
Conducting transportation	(D) 1.90	0.02	(D) 5.66	(D) 2.08	(D) 0.34	(D) 2.49	(D) 3.82	(D) 4.07	(D) 6.29
Traffic	(D) 25.86	23.58	(D) 5.06	21.60	7.93	(D) 23.68	3.09	17.54	(D) 22.11
General and miscellaneous	3.29	(D) 4.55	3.74	3.49	(D) 2.01	(D) 2.02	(D) 1.25	(D) 5.44	(D) 17.02
Transportation for investment—Credit	20.51	57.67	.....	.....	(D) 75.59	(D) 100.00	(D) 67.15	(D) 71.17	(D) 46.37
Total operating expense	(D) 1.66	(D) 0.83	(D) 1.84	1.21	(D) 1.89	(D) 0.49	(D) 2.10	(D) 2.58	(D) 5.01

OPERATING STATISTICS—PER CENT INCREASE OR (D) DECREASE

	City Companies			Interurban Companies			Combined Properties		
Passenger car-miles	(D) 0.68	1.99	(D) 3.04	(D) 2.77	(D) 3.55	(D) 1.42	(D) 2.78	(D) 3.85	(D) 4.80
Total revenue car-miles	(D) 0.70	(D) 0.91	(D) 2.53	0.32	(D) 0.42	(D) 1.43	(D) 2.27	(D) 3.13	(D) 5.19
Revenue passengers	(D) 0.01[1]	(D) 1.32	0.44[7]	(D) 3.96[11]	(D) 8.96[12]	(D) 0.76[15]	(D) 7.13[18]	(D) 8.25	(D) 10.95[24]
Transfer passengers	(D) 2.68[2]	(D) 1.96[5]	(D) 39.94[8]	(D) 3.37[11]	(D) 3.00[13]	(D) 6.57[16]	(D) 6.39[19]	(D) 7.57[22]	0.52[25]
Total passengers	(D) 1.57[1]	(D) 0.82	(D) 6.39[7]	(D) 3.40[11]	(D) 8.63[12]	(D) 0.88[15]	(D) 7.02[18]	(D) 8.26	(D) 10.81[24]
Passenger revenue	(D) 0.92	(D) 0.01	(D) 4.87	(D) 3.75	(D) 7.86	(D) 5.58	(D) 4.21	(D) 8.28[22]	(D) 10.03
Revenue car-hours	(D) 2.02[3]	(D) 0.78[6]	(D) 1.15[9]	.....	(D) 3.00[14]	(D) 0.35[15]	(D) 3.33[20]	(D) 3.89[22]	(D) 9.74[26]
Passenger car-hours	(D) 2.02[3]	(D) 0.78[6]	(D) 2.20[10]	.....	(D) 3.90[14]	0.29[15]	(D) 3.22[20]	(D) 3.90	(D) 9.34[26]
Miles of single track	0.08	(D) 1.18	(D) 3.04	.....	0.33	0.61	(D) 0.23	(D) 1.68	(D) 2.12
Passenger cars operated(a)	(D) 1.11[4]	0.20	2.61	7.61[11]	(D) 0.31[14]	(D) 1.02[17]	(D) 5.45[21]	(D) 4.77[23]	(D) 9.71[27]

a Average maximum number of passenger cars in service daily.

[1] Reported by 41 companies.
[2] Reported by 39 companies.
[3] Reported by 40 companies.
[4] Reported by 36 companies.
[5] Reported by 18 companies.
[6] Reported by 21 companies.
[7] Reported by 13 companies.
[8] Reported by 9 companies.
[9] Reported by 12 companies.
[10] Reported by 11 companies.
[11] Reported by 2 companies.
[12] Reported by 20 companies.
[13] Reported by 5 companies.
[14] Reported by 15 companies.
[15] Reported by 24 companies.
[16] Reported by 5 companies.
[17] Reported by 23 companies.
[18] Reported by 33 companies.
[19] Reported by 29 companies.
[20] Reported by 30 companies.
[21] Reported by 27 companies.
[22] Reported by 22 companies.
[23] Reported by 20 companies.
[24] Reported by 18 companies.
[25] Reported by 9 companies.
[26] Reported by 19 companies.
[27] Reported by 15 companies.

car-miles of these companies decreased 2.77 per cent the total car-miles increased 0.32 per cent. The companies in the Class B group were attempting to do the same thing, as is shown by the fact that their passenger car-miles fell off 3.53 per cent, while their total car-miles dropped only 0.42 per cent.

It would naturally be expected that companies operating both city and interurban service would show results somewhere between those shown by the city lines, on the one hand, and by the interurban on the other. In other words, the combination lines ought to present approximately an average of the results of the other two classes of companies. According to reports of these companies, however, they seem to have suffered much more heavily from the adverse conditions prevailing in 1927 than either of the other groups. Probably the explanation is that, in general, they serve and connect up comparatively small cities and rural communities. They are, therefore, more directly susceptible to the competition of private automobiles and intercity bus lines. All of the companies in this group were affected adversely by conditions in 1927 but, as usual, the small companies seem to have been affected more than the others.

This year for the first time Mr. Murphy has been able to present comparative balance sheets of a large group of companies. The last eight tables in his series are devoted to comparative balance sheets and income statements of a group of 161 companies and separate balance sheets and income statements are shown for the 58 city companies, 44 interurban companies and 59 combination city and interurban companies that comprise the group of 161 companies.

The balance sheet of the whole group shows an investment of $1,778,335,435 in road and equipment in 1927 compared with $1,749,764,866 in 1926—an increase of $28,570,569. The total investment in road and equipment of these 161 companies represents approximately 35 per cent of the total investment of the entire electric railway industry in the United States. As against the investment in road and equipment there was outstanding $749,858,830 in stock and $924,731,265 in long-term debt, a total capitalization in 1927 of $1,674,590,095, or $103,745,340 less than the value at which the physical property was carried on the books.

The total corporate surplus of the group of companies increased from $76,731,095 for 1926 to $79,546,234 in 1927. Most of this increase was in the appropriated surplus which arose from $24,758,845 in 1926 to $27,108,668 in 1927—an increase of $2,349,823.

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The profit and loss surplus increased $432,552, or from $51,790,088 in 1926 to $52,222,640 on 1927. The total current assets amounted to $105,398,316 in 1927, compared with a total current liability of $116,455,404—a ratio of 0.90. In 1926 current assets amounted to $104,081,399 and current liabilities to $114,132,465—a ratio of 0.91.

It is interesting to note, says the author, that in these balance sheets all of the groups materially increased their reserves for depreciation. In the case of the city companies the reserve was increased from $70,648,998 in 1926 to $75,597,252 in 1927, or an increase of 7 per cent. Interurban lines increased their reserve from $7,405,358 in 1926 to $8,089,032 in 1927, or 9.23 per cent, while the combination city and interurban group increased their reserve from $35,439,553 to $40,726,296, or an increase of 14.91 per cent.

In all of the groups the reserve for depreciation is approximately 7 per cent of the investment in road and equipment. For the 161 city, interurban and combination city and interurban companies, the depreciation reserve amounted to $124,412,580 or about 6.45 per cent of the investment in road and equipment.

TRAFFIC STATISTICS OF THE UNION TRACTION COMPANY

Dec. 31, 1927

Passengers carried, interurban lines	4,234,896
Passengers carried, city lines	6,688,653
Passengers carried, interurban buses	119,529
Passengers carried, city buses	2,055,822
Total passengers carried	13,098,900
Mileage of cars, interurban lines, miles	7,017,752
Mileage of cars, city lines, miles	1,434,577
Total mileage of cars, miles	8,452,329

Revenues on Union Traction Lower

Anderson, Ind., company reports a decrease of $109,258. Passengers carried show large increase. Liberal allowance made for maintenance

ARTHUR W. BRADY, receiver for the Union Traction Company of Indiana, has filed the 1927 report in the Circuit Court at Anderson, Ind. It shows that the railway operating revenue for 1927 was $2,951,206, a decrease of $109,258 compared with 1926, and that operating expenses were $2,708,360, an increase of $141,619 compared with the previous year. Of the increased expenses $96,689 more than in 1926 was expended for maintenance of way and structures. Gross income for 1927, or the income after operating expenses and taxes but before charges for bond interest and other fixed charges, was $169,439, compared with $408,624 in 1926.

INCOME ACCOUNT OF THE UNION TRACTION COMPANY

	1927
Revenue From Transportation	
Passenger	$1,935,256
Baggage	5,197
Parlor, chair and special car	10,827
Mail	6,048
Express	133,212
Milk	13,721
Freight and switching	676,287
Total	$2,780,552
Revenue From Operation Other Than Transportation	
Station and car privileges	$14,184
Parcel room receipts	55
Car service and storage	616
Rent of tracks and terminals	3,812
Rent of equipment	12,458
Rent of buildings and other property	14,320
Power	124,247
Miscellaneous	960
Total	$170,654
Total operating revenue	$2,951,206
Operating Expenses	
Way and structures	$668,312
Equipment	349,837
Power	556,432
Conducting transportation	749,497
Traffic	52,916
General and miscellaneous	331,364
Total operating expenses	$2,708,360
Net operating revenue	242,845
Taxes	98,000
Net operating revenue less taxes	$144,845
Other income	24,593
Gross income	$169,439

In the operating expenses for the year are included $668,312 for maintenance of way and structures and $349,837 for maintenance of equipment. This makes the total sum charged for maintenance of the property $1,018,150, equal to 34.5 per cent of the gross railway operating revenue for the year.

The 1927 account for additions and betterments shows expenditures for the year of $43,275. There was expended in addition $8,156 for buses. These amounts are exclusive of charges in 1927 of $37,159 for extensions of and betterments to the property of the Traction Light & Power Company, wholly owned by the Union Traction Company of Indiana. The operations of the Traction Light & Power Company were extended in 1927 to Honey Creek and Warrington, thus making 50 towns and villages served by the company at the end of the year. The net income of the company in 1927 was $18,486.

Gross revenues from bus operation in 1927 were $131,723 and operating expenses, taxes, interest and amortization charges were $305,559, making the deficit from bus operation $173,835. This includes $96,618 for depreciation and amortization.

There were 13,098,900 passengers carried during the year by both interurbans and buses an increase of more than 1,000,000 over 1926.

In 1927, $172,159 was paid on the principal of notes representing car, bus and power betterment equipment, reducing liabilities shown at the beginning of the year in that amount. No new equipment notes were issued.

During the year the $12,000 of Broad Ripple Traction Company bonds were retired and $6,000 of additional bonds of the issue were purchased out of the proceeds of the property. The interest on the purchased bonds was paid to the receiver. Unexpired proceeds remain in the hands of the trustees for application to the purchase of additional bonds. Interest at 6 per cent was paid as heretofore on the $328,000 Marion City Railway bonds secured by first mortgage on city lines at Marion and the interurban line between Marion and Summitville and on the $36,000 of Citizens Street Railway bonds secured by first mortgage on city lines at Muncie. These bonds matured on Dec. 1, 1927. No arrangement has as yet been made by the railway company for meeting this maturity.

	Total Operating Revenue	Total Operating Expenses	Taxes	Other Income	Gross Income
Union traction	$1,368,596	$1,188,926	$38,563	$16,096	$157,203
Indianapolis Northern	759,696	713,652	22,010	5,101	29,135
Muncie, Hartford & Fort Wayne	268,085	247,641	10,054	907	11,296
Muncie-Portland	94,348	96,607	5,752	398	*7,613
Indianapolis, New Castle and Eastern	296,720	280,174	9,172	1,307	8,680
Muncie-Union City	86,136	105,508	7,183	537	*26,017
Marion-Wabash	46,775	51,060	3,880	151	*8,013
Anderson-Middletown	30,846	24,788	1,381	93	4,769
Total	$2,951,206	$2,708,360	$98,000	$24,593	$169,439

*Deficit.

While this statement is based on allocations of revenues and expenses differing in some respects from those used in 1925 and 1926, it is still tentative. The revision of the segregated earnings and expenses for the three years of the receivership, with a view to securing more accurate results, has continued to receive active attention, and a report on the subject will be made to the court later.

Operation of the Anderson-Middletown interurban line resulted in a surplus of $4,769. That a surplus instead of a deficit, as in 1925 and 1926, is shown is due to a change in the method of allocating revenues and expenses. Operation of the Muncie-Union City line resulted in a deficit of $26,017, being $15,203 greater than that shown for 1926. Operation of the Marion-Wabash interurban line resulted in a deficit of $8,013, which is $2,310 more than in 1926. A question under consideration is the action which should be taken with respect to these three interurban lines and certain non-paying street railway lines.

Segregation of earnings and expenses of the respective lines subject to the liens of the principal mortgages and also of the lines leased to the Union Traction Company of Indiana was undertaken, and the earnings and expenses so segregated for the year are shown tentatively and subject to revision.

The Union Traction Company owns 309 miles of line and leases 445½ miles.

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Expenses in Honolulu Decreased

Total revenue of the Honolulu Rapid Transit Company, Ltd., Honolulu, I. H., for the year 1927 was $1,019,245, compared with $1,023,772 for the year 1926. Total operating expenses for the year were $626,453, compared to $662,932 for the year 1926, in addition to which the sum of $24,238 was charged to operating expenses for replacements during the year compared with $13,939 for replacements during 1926. These facts were contained in the manager's report for the year ended Dec. 31, 1927.

Traffic revenue and expense figures for 1927 and 1926 are shown in the accompanying tables.

RAILWAY PASSENGER TRAFFIC

	1927	1926
Full fares and half fares	16,043,809	16,286,105
Free fares	59,593	92,081
Total	16,103,402	16,378,186
Transfer passengers carried	3,550,694	3,357,651

BUS OPERATIONS

KALIHI

	1927	1926
Full fares and half fares	386,500	347,287
Free fares	1,375	1,108
Total	387,875	348,395
Transfer passengers carried	343,427	315,165
Bus-miles operated	126,624	128,441

KAIMUKI

	1927
Full fares and half fares	184,506
Free fares	36
Total	184,542
Bus-miles operated	75,008.10

REVENUE

	1927	1926
Passenger revenue	$973,417	$992,063
Bus revenue	30,096	21,536
Special car revenue	1,260	1,265
Freight revenue	.....	242
	$1,004,774	$1,015,107

OPERATING EXPENSES

	1927	1926
Way and structures	$51,426	$55,204
Equipment	69,865	74,127
Power	88,796	94,179
Conducting transportation	289,090	322,356
Traffic	2,693	2,252
General and miscellaneous	124,580	114,811
	$626,453	$662,932

REVENUE ACCOUNT OF THE HONOLULU RAPID TRANSIT COMPANY, LTD., FOR YEAR ENDED DEC. 31, 1927

Revenue from transportation		$1,004,774
Operating expenses		626,453
Net revenue from transportation		$378,320
Revenue from other railway operations		14,471
Net revenue from railway operations		$392,792
Taxes	$123,801	
Property	$87,287	
Income	8,409	
Corporation income	25,331	
Public utilities	2,023	
Motor vehicle licenses	748	
REPLACEMENTS:		
Chargeable to operating expense	24,238	148,040
Gross revenue, less operating expenses, taxes and replacements		$244,725
Depreciation	$51,766	
Profit and loss	1,873	53,640
Net revenue 1927		$191,111
Interest on bank loans	$6,600	
Dividends, 7 per cent	175,000	181,600
Balance net revenue 1927 to surplus		$9,511
SURPLUS:		
Balance as at Jan. 1, 1927	$279,914	
Less additional corporation income taxes for years 1921, 1922 and 1923	11,619	268,294
Balance carried to 1928		$277,806

In a consideration of the allowable return in Honolulu President Castle in the report computes a deficiency of $80,000 in return for 1927. He claims that if the sum of $70,000 is added for each year for depreciation on track and distribution system which should have been charged but was not, the actual deficiency is much greater.

Need Exists for Fair Return

Mr. Castle said the street railroad had to run, and the only way it could run was when it returned a fair dividend to its stockholders. Operating expenses could not be cut further, so the only answer was a rate increase. This should be the minimum amount required to operate a decent service and to give to the investors a fair return. He believed that a readjustment of rates would produce more income.

Partial Abandonment in Salt Lake City

Application of the Utah Light & Traction Company to abandon portions of four railway lines in Salt Lake City has been granted by the Public Utilities Commission of Utah. It was shown that the four lines to be abandoned have been operated at a loss for several years. The trackage will total 5 miles.

The company's application to abandon service and tear up tracks on West Temple Street, from Ninth to 21st South Street was denied. The commission ordered this line maintained with "greater comfort and convenience to car-riding patrons."

Traffic, Fare and Wage Figures

The number of revenue passengers, including bus passengers, reported by 215 companies to the American Electric Railway Association for April, 1928, compared with April, 1927, is as follows:

April, 1928	800,879,714
April, 1927	829,471,710
Decrease, per cent	3.45

The decrease for April is the largest which has occurred this year. There were five Sundays in April, 1928, compared with four in 1927, and this fact is largely responsible for the greater decrease.

Average cash fares in cities of 25,000 population and over were:

	Cents
May 1, 1928	8.1186
April 1, 1928	8.1186
May 1, 1927	7.9403

There was no change in the average basic fare in American cities during the month of April.

The average maximum hourly rates paid motormen and conductors in two-man service by companies operating 100 or more miles of single track:

Month	Average Hourly Rate Cents	Index Number 1913=100 Per Cent
May 1, 1928	57.40	210.64
April 1, 1928	57.40	210.64
May 1, 1927	57.11	209.58

Hattiesburg Bonds Called

The Hattiesburg Traction Company, Hattiesburg, Miss., has called for redemption or purchase on July 1, 1928, all of its outstanding general lien, sinking fund 6 per cent gold bonds at principal with interest accrued and unpaid to the date set for payment, together with a premium of 5 per cent of the principal of each of the bonds. They are payable at the office of the American Exchange-Irving Trust Company, New York.

Abandonment of Two Lines in New York State Approved

A declaration of abandonment by the Hudson Valley Railway of the Fort Edward Thomson line and the Northumberland-Stillwater line was approved on April 30 by the Public Service Commission. Actual abandonment of the two lines, the first covering a distance of 11 miles, and the second a distance of 14 miles, is effective July 1.

OPERATING STATEMENT OF THE HONOLULU RAPID TRANSIT COMPANY, LTD.

	Gross Operating Revenues			Operating Expenses and Other Charges									Net Revenue Exclusive of Deductions for Depreciation, Interest and Profit & Loss
1927	Transportation	Other Than Transportation	Total Revenue	Way and Structures	Equipment	Power	Conducting Transportation	Traffic	General and Miscellaneous	Total Operating Expenses	Taxes	Total Operating Expenses and Taxes	
	$1,004,774	$14,471	$1,019,245	$51,426	$69,865	$88,796	$289,090	$2,693	$124,580	$626,453	$123,801	$750,254	$268,990
Replacements	.....	.....	.....	10,445	13,705	87	.....	.....	.....	24,238	.....	24,238	24,238
Total 1927	$1,004,774	$14,471	$1,019,245	$61,871	$83,571	$88,883	$289,090	$2,693	$124,580	$650,691	$123,801	$774,493	$244,752
Total 1926	$1,015,107	$8,664	$1,023,772	$65,832	$77,438	$94,179	$322,356	$2,252	$114,811	$676,872	$122,678	$799,550	$224,221

Per cent operating expenses to operating revenues 64.76.
Per cent operating expenses to total operating revenues 63.84.
Per cent operating expenses and other charges to total operating revenues 75.99.

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Book Reviews

Universal Directory of Railway Officials, 1928

Published by the Directory Publishing Company, London, 404 pages, price, $5, postage included.

This is the 34th edition of a very useful book, containing a list of leading railroad officials. The first part of the book lists the railroads alphabetically by countries. Under the name of each are particulars of the length of track, gage and equipment, with a list of the principal officials. The name of the company is given in English, but is repeated in the language of the country if the country is one in which English is not spoken. The second part of the book contains an alphabetical list of the railroads and railroad associations in the different countries, together with names of officials.

Facts and Figures of the Automobile Industry—1928 Edition

Published by National Automobile Chamber of Commerce, New York, N. Y. 96 pages.

Further information and special studies have been made available in the tenth annual edition of this booklet of the National Chamber of Commerce. Here are tabulations of the major automobile market and of methods of taxation in different states; a study of gasoline consumption by states; transcontinental bus routes; a list of highway grade separations and figures on metropolitan traffic. Many charts and diagrams complete this picture of the automobile industry. A valuable index is included. Certain data on common carrier buses were reprinted from *Bus Transportation.*

Financial and Business Forecasting

Dr. Warren F. Hickernell, Alexander Hamilton Institute, New York. 2 volumes. 914 pages. $10 for both volumes.

To the business man and manufacturing executive who wishes to possess a working knowledge of the basic theories of the business cycle minus the all too familiar perplexing mathematical formulæ; a quick, though vivid, view of the waves of prosperity and of overspeculation, which have characterized the course of business in the United States and Europe for more than a century past; and finally the basic methods now in use in financial analysis and forecasting, these two volumes will prove interesting and enlightening. The cyclic theories of Mills, Jevon, Moore, Juglar and Mitchell are explained in a simple manner, and their strength and weakness pointed out.

The scholar may stop with an analysis of the causes and effects, but for the man in active business the question of how to apply theory to his own affairs assumes paramount importance. Doctor Hickernell accordingly devotes his second volume to a study of financial analysis and forecasting, bringing out the fact that the four symbols of forecasting are: (1) basic business statistics; (2) a knowledge of economic principles; (3) perspective, based on a study of business history, and (4) good judgment in applying principles to the interpretation of statistics. Before the war industrial fluctuations went to extremes, and individual markets were importantly affected by the general trend. In recent years, however, economic conditions have been well stabilized, and the analysis of individual markets has become increasingly important.

Business, the Civilizer

By Earnest Elmo Calkins, Boston. Little, Brown & Company, 1928. 310 pages. Price, $3.

On the assumption that the progressive railway operator has at least a passing interest in the contemporary business scene and a very live interest in the subject of advertising, a reading of "Business, the Civilizer" is informative and assuredly entertaining. Mr. Calkins author of "Louder Please!", the autobiography of a deaf man, reviews the history of advertising, not overlooking some of its questionable practices, which he believes are fast disappearing; stresses its value as a force in modern business and predicts its holding an invulnerable position in a thriving business world. Coming some six months after "Your Money's Worth," a dark picture drawn by Messrs. Chase and Schlink of the American gullibility for advertising misrepresentation, this work presents the constructive side of this activity.

Not all of Mr. Calkins's subject has application to the railway industry. However, his comments on living up to advertising and its remarkable effects on business are directly in line with the advice of advertising men connected with railway enterprises. Certainly, "the service you ought to render" has transformed more than one company because of the effort of making a worthwhile appeal to the public. On this point Mr. Calkins says: "He cannot say one thing and do another, and since the things he says, or permits his advertising man to say for him, is that more nearly ideal thing which he always meant his business to be, it is that thing which, under the influence of the advertising urge, his business gradually becomes." Fifty years ago, he says, neither the salesman nor his employer realized the potentialities of future business a casual purchaser represented. Then came advertising and its prestige known as good will. Good will, in his opinion, is built up by continuous advertising which will ensure continuous buying on the part of a large number of consumers.

And when he discusses beauty as a business force and a factor in selling his ideas, though the ideas are not new, they provoke more thought on the apparent changes in the economic and social life of today. The railway man has not lagged in this movement for converting purely utilitarian products into things of beauty, nor have his efforts to break with tradition in the matter of car equipment gone unnoticed or unrewarded. Mr. Calkins's work is an argument for business "the best-done job in the world."

Elektrische Vollbahnlokomotiven

Electrical Main Line Locomotives, by Dr. Karl Sachs. Berlin, Julius Springer, 461 pages, 22 insert plates. Price, 84 marks.

This is by far the most extensive book on electric locomotive design with which the author of this review is acquainted. It is divided into four parts: (1) Power and loading, which takes up questions of resistance to movement, traction coefficients, speed on curves, etc.; (2) the mechanical portion of the locomotive equipment; (3) the electrical portion, and (4) accounts of different late types of locomotives. The third part, that relating to the electrical equipment, in turn is divided into four parts to cover direct-current locomotives, single-phase locomotives, three-phase locomotives and transformer locomotives. While the book relates largely to European practice, American design and methods are also represented. A feature is the large number of detailed drawings of portions of the equipment, of connections, and of complete locomotives.

Accident Facts, 1928

National Safety Council, Chicago. 46 pages.

No. 17 of the Council's public safety series gives a great many interesting data on accidents in 1927 and in earlier years. The figures show, for example, between 1911 and 1927 an increase of 20 per cent in all accidental deaths. These include an increase of 1,050 per cent in automobile deaths, a decrease of 37 per cent in railroad deaths and a decrease of 44 per cent in street car deaths. Altogether, there were 1,661 deaths during 1927 due to street car accidents; of these 475 were caused by collisions with automobiles. The total number of accidental deaths from motor vehicle accidents was 25,775 during the same year. Sixty-five per cent of the motor vehicle deaths were caused by motor vehicles striking pedestrians.

Storage Batteries

Morton Arendt, assistant professor of electrical engineering Columbia University, Fellow American Institute of Electrical Engineers. D. Van Nostrand Company, Inc., New York, N. Y. 290 pages. Price, $4.50.

This is a practical survey of the storage battery covering its production, performance and control. An introduction to the subject and a history of it are covered and a study of factors influencing capacity and efficiency.

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Personal Items

A. T. Clark Honored as Head of New Association

A. T. Clark was elected president of the newly formed Association of Electric Railway Equipment Men of the Middle Atlantic States at a meeting in Baltimore on May 16. The association was formed through a desire of outstanding equipment men to improve methods and practices in the shops. Mr. Clark is superintendent of rolling stock and shops of the United Railways & Electric Company, Baltimore. He is also chairman of the rolling stock committee of the American Electric Railway Association and chairman of the judges of the maintenance prize committee for ELECTRIC RAILWAY JOURNAL.

A. T. Clark

Back in 1907 when Mr. Clark was in the employ of the J. G. Brill Company he was asked by the then superintendent of rolling stock and shops, H. H. Adams, to go to Baltimore to assume the duties of assistant superintendent. About a year thereafter Mr. Adams resigned as superintendent and Mr. Clark was appointed acting superintendent, later receiving the full title.

Early in his career he was employed as an apprentice in the erecting shop of the Southwark Foundry & Machine Company, of Philadelphia. Later he resigned from that position to enter the drafting room of the Bethlehem Steel Company, South Bethlehem, Pa. In 1901 he became connected with the Link-Belt Engineering Company, Philadelphia, but two years later resigned to go with the Brill Company. When the Brill Company opened a department for the construction of steel underframes in 1907 Mr. Clark was appointed foreman of the department.

Mr. Clark was born in Oakland, Cal., 49 years ago. He received his elementary education in the public schools of that city and prepared for Yale at the Central High School in Philadelphia. He was graduated from the Sheffield Scientific School with the degree of M.E., and later pursued a special course in electrical engineering conducted in the evening at Drexel Institute, Philadelphia.

H. S. Johnson Resigns at Honolulu

H. Stewart Johnson has resigned as manager of the Honolulu Rapid Transit Company, Honolulu, Hawaii, after more than 20 years' service, due to ill health. He is planning a round-the-world trip.

Mr. Johnson arrived in Honolulu in May, 1899, and was employed as an assistant engineer in the construction of the road. In 1913 he was appointed chief engineer and in 1918 manager.

During his association with the company he handled several projects for outside organizations. He was connected with the U. S. Army in the installation of the batteries on Diamond Head, with the Territorial Loan Board on highway construction and for a time was assistant city engineer. He also acted as cival engineer for the Honolulu Gas Company.

William Chamberlain Heads Chicago Utility

William Chamberlain, vice-president and general counsel of the United Light & Power Company, Chicago, Ill., since 1914, was elected president at the recent annual meeting of directors. He succeeds Richard Schaddelee, resigned, who was elected chairman of the executive committee. Mr. Schaddelee, who was one of the organizers of the United Light & Railways Company, predecessor of the United Light & Power Company, had been general manager since 1904 and president since 1926.

Changes Announced in Parkersburg Division

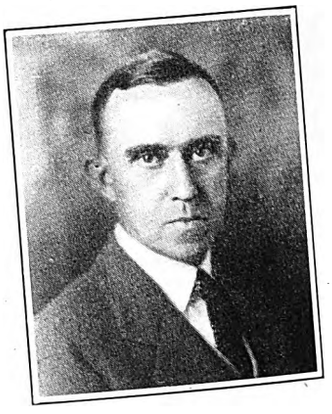
William M. Martin, manager of the Parkersburg-Marietta, W. Va., division of the Monongahela-West Penn Public Service Company, resigned on June 1 to accept a position with a large electrical company in New York State. Mr. Martin had been manager of the Parkersburg-Marietta division since October, when he succeeded C. Howard Hardesty, now assistant to Capt. J. M. Alexander, who is assistant to the president.

James H. Trissler, former power distribution superintendent, has been named acting manager of the division. He became an employee of the Parkersburg, Marietta & Interurban Railway, in 1909, having formerly been an employee of the old West Virginia Telephone Company. At one time he was connected with the Kanawha Traction & Electric Company.

Promotion for J. A. Longley With Tennessee Properties

James A. Longley, for the past several years manager of the production and transmission department of the Tennessee Electric Power Company, Chattanooga, Tenn., was recently appointed assistant to J. C. Guild, general manager of the Tennessee Electric Power Company and president of the Nashville Railway & Light Company.

Mr. Longley's first connection with the electrical industry was in 1910 when he went to Portland, Ore., on power plant construction work for the Portland Railway, Light & Power Company. In 1913 he went east to Columbus, Ohio, just after the Dayton flood, to work on a power plant in that city, later going to Nashville on the construction of the Nashville steam plant. In October, 1914, he was transferred to Chattanooga as assistant general superintendent of the Tennessee Power Company and since that time has been identified with the local utility interests in that city. As manager of the production and transmission department of the Tennessee Electric Power Company, Mr. Longley has been responsible for the vast system of transmission lines in middle and eastern Tennessee.



James A. Longley

Mr. Longley is a native of Massachusetts and received his engineering education at the Massachusetts Institute of Technology. After leaving college his first work was along steam heating lines. Later he was engaged in mining engineering in Arizona.

Obituary

W. E. FREIR, editor of the *Electric Railway & Tramway Journal*, London, died suddenly in a railway train near Paris when he was on his way back to England from the International Tramway Congress in Rome. Mr. Frier founded the *Electric Railway & Tramway Journal* in 1899. For many years prior to that he had been editor of *Ironmonger*. He was well known as an English journalist. Mr. Freir was 80 years old.

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Manufactures *and the* Markets

Public Opinion Within Industry Will Stop Price Cutting

Industrial associations should call conferences of buyers and sellers to discuss ethics of buying

By Earl Whitehorne

EXECUTIVES of American industry realize today that they have made a serious mistake through the last quarter century. They have allowed themselves to become so absorbed in the problems, the achievements and the fascinations of production that they have neglected distribution. Our methods of distributing our goods have grown by main strength and awkwardness. The American business man faces this well-known problem.

Also something else has been happening that has not been generally noticed. This tremendous increase in production has brought with it an intense pressure on sales. American industry has also become so engrossed in selling that it has neglected the efficiencies of purchasing. Yet for every sale there must be a purchase and the practices and the policies and the principles of the man who buys have as much influence upon the success of the transaction as the methods and the motives of the man who sells.

The time has come, therefore, to turn some thought upon this business of buying that has so much to do with whether sales are profitable or not. We have got to throw the searchlight on the present status of the purchasing function in industry just as we have got to study and reform the process of distribution in this country.

When a manufacturing company enters the market with a line, its officials set a schedule of prices based on their costs, which in turn are regulated by competitive conditions. If the president of that company will permit his sales manager to come in and talk him into permitting a price cut to get some big order and the salesmen find it out, then the salesmen will everlastingly be importuning the sales manager to let them cut to meet another bidder on this job and that.

Price cutting is not the salesman's fault. It is the fault of the executive who can not face the fact that the only relief in a market demoralized by over production and price cutting is reduced production. It is the fault of the executive who lacks the pluck to reduce his output rather than sell at a loss.

Manufacturers will have to ultimately face the economic law that to sell at a loss is waste and an offence against industry. When prices fall below cost they will have to accept their individual responsibility to voluntarily curtail production as their contribution toward restoring the market to a balance.

The purchasing agent has always been the red-headed stepchild of industry. In the beginning the boss did the buying in odd times. Then he detailed a young man to help him. As buying has grown in volume purchasing agents have become more important, until today in many progressive corporations the buying is done by a vice-president with an able staff, and he is a big man with a broad knowledge of markets and men. But in too many cases the purchasing agent still lacks the responsibility and authority he needs to make his job measure up to his titular function. Too often he is just expected to buy what he is told and his performance is measured by his ability to save money on price.

As one large buyer stated, "There are four factors in every purchase that should be given consideration:

1. Suitability to the need
2. Quality of the article
3. Responsibility of the vender
4. Price

Price is only one of the elements that must be weighed in establishing a value and it should not be considered until the other three factors have been established as satisfactory." This man knows what he is talking about.

Therefore, if the purchasing agent is to contribute his share toward overcoming this practice of price cutting that industry is suffering from and stewing about right now, he must face these facts, and facing them he will bring new dignity to his profession and new opportunity to himself. He must recognize that nothing short of this ideal relationship between the seller and the buyer is really efficient and profitable. He must set his entire operation as nearly as possible on that plane and make value, not price, the chief objective. He must study the cost of buying as well as the cost of goods.

There are four things to be done:

1. If the purchaser would demand firm bids, then general price cutting would soon cease. For a firm bid is like a signed order. It's the word of the house. It puts industry on the one price basis just as solidly as the modern department store. It means that a price made is the best and final price and the buyer is expected to place the business by selecting the firm bid that offers the best value—not price alone, but value.

2. While this practice of firm bids is crystallizing into a custom, whenever bidders are called back by a purchasing agent and asked for a better price, let the bidder demand that the other bids be shown to him, so that he will know that he is not being lied to, and that his price is indeed high for equal value.

3. While the trickery of baiting bidders still continues in the world of business let bidders hold *post mortem* comparisons of bids, by submitting their bids on closed business to their trade associations for comparison and report.

4. Let the buyer frankly and publicly proclaim that he will thereafter shun the man who cuts his price, because the first price is supposed to represent the honest value of the goods, and the man who cuts stands self-convicted either of trickery or weakness.

Price cutting is just an economic disease. Immediate relief can only be sought through the building of public opinion among buyers and sellers. But the only way there is to develop public opinion is by discussion that corrects loose thinking and makes clear the moral and economic principles which all men desire to follow once they are generally understood and have gained social standing.

This calls for leadership and I believe that in this kind of a situation this leadership can best come from two sources—the industrial associations and the industrial press. I, therefore, offer these two suggestions, which I believe will bring more immediate influence to the correction of the practice of price cutting than any other action which might now be attempted—

1. That the trade, industrial, and business publications of the country promote the widest possible discussion of the economic inequity of price cutting, drawing out the opinions, principles and practices of the leading men of the field and developing a more common acceptance of the truth of it and a more general adoption of these simple resources of correction.

2. That the trade and industrial associations of each branch of industry support this purpose by calling a conference of the leading purchasing agents of the group to meet with a representative number of their prominent sales executives, for a discussion of the ethics and economics of this business of buying to the end that trade practice in that field may be improved both in selling and in purchasing in so far as price cutting is concerned.

I have asked a good many sales executives this question, when they have been discussing this buyer market—"What is your own purchasing agent doing? Is he buying in the way that you would like to have your own customers buy? Does he foster price cutting?"

To many of them it has been a new

Exhibitograph No. 11

Inquiries for Space

at the

BIG A.E.R.A. SHOW

are coming in continually

Have your Convention Arrangements been completed, Mr. Manufacturer?

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slant on the subject. Yet there is no single influence more important to success in sales than the methods and principles of the man who buys. It is worth while, therefore, for the sales minded chief executives of industry to see that their own purchasing methods are right.

Signal System for Pittsburgh

Pittsburgh Railways, Pittsburgh, Pa., has ordered materials from the Union Switch & Signal Company for installation of an absolute permissive block signal system on its single-track line between Mine No. 3 and Tylerdale, a distance of 20 miles. The power for this installation will be supplied from three substations over a 2,200-volt single-phase transmission line. The work involves 58 color light signals, 60 impedance bonds, 180 a.c. relays, 95 transformers, and automatic substation panels by which power is fed from reserve substations in case of failure of the normal source.

Order Exhibit Extras Now

Hardwood and wicker furniture, oriental and domestic rugs, flowers, plants and floral decorations, drinking water, compressed air and current will all be available at the A.E.R.A. Convention. To avoid the last minute rush, Director of Exhibits Fred Dell advises that the order blanks for the above-mentioned service be filled in and returned to the exhibit committee as soon as possible. All exhibitors have been furnished with these blanks. Where a choice in quality is to be had such as in furniture, rugs and flowers, there is a decided advantage in ordering early.

New Track in Worcester

Work will be started soon by the Worcester Consolidated Street Railway, Worcester, Mass., on the reconstruction of 3,154 ft. of track on Grove Street, from Chadwick Square to the Walker Ice House, Worcester, Mass. The following material will be used: 97 tons of rail, 1,600 ties, 105 Thermit joints, 3,154 tie plates, 535 flat tie rods and 21 kegs of spikes at a cost of $20,284.80.

Work was started about June 1 on the renewal of a switch, mate, frog and lead rails and the reconstruction of 100 ft. of track on Vernon Street at T.O. near St. Vincent's Hospital. The following material will be used: one complete end of a turnout, 130 ties, 3 tons of 7-in. girder rail, 100 tie plates, 18 tie rods, 2 kegs of spikes, 200 yds. of paving and 40 bonds at a cost of $2,771.42.

Renewal of a switch and mate at T.O. 86 on Franklin Street near the B. & A. freight depot and also the installation of a new solid manganese steel crossing over the tracks of the B. & A. Railroad near the Graton & Knight tannery at a cost of $2,400, are planned in the near future.

METAL, COAL AND MATERIAL PRICES F. O. B. REFINERY

	June 5, 1928
Metals—New York	
Copper, electrolytic, cents per lb	14.525
Copper wire, cents per lb	16.625
Lead, cents per lb	6.30
Zinc, cents per lb	6.475
Tin, Straits, cents per lb	49.25
Bituminous Coal, f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	4.2
Somerset mine run, f.o.b. mines, net tons	1.825
Pittsburgh mine run, Pittsburgh, net tons	1.775
Franklin, Ill., screenings, Chicago, net tons	1.70
Central, Ill., screenings, Chicago, net tons	1.55
Kansas screenings, Kansas City, net tons	2.50
Materials	
Rubber-covered wire, N. Y., No. 14, per 1,000 ft.	5.3
Weatherproof wire base, N.Y., cents per lb.	17.125
Cement, Chicago net prices, without bags	2.05
Linseed oil (5-bbl. lots) N. Y., cents per lb.	10.8
White lead in oil (100-lb. keg), N. Y., cents per lb.	13.75
Turpentine (bbl. lots), N. Y., per gal.	$0.61

Chicago "L" Terminal Started

Construction work is now under way on a new $50,000 terminal station at Logan Square, which is being erected by the Chicago Rapid Transit Company, Chicago, Ill., The exterior of the terminal will be in white terra cotta with old English style mission brick panels. The interior will be finished with art marble wainscoting throughout and the floors will be of terrazzo.

Platform facilities at Adams and Wabash station in the Loop are being increased by widening the south end of the outer platform from 10 to 14 ft. and extending canopies a total of 176 ft. at the north ends.

Track and Terminal for Trenton

Trenton & Mercer County Traction Corporation, Trenton, N. J., will lay a double track on Perry Street, from Broad to Warren Streets and new tracks on North Warren Street. The company also will shortly have plans drawn for a terminal on Perry Street. The total improvements will cost about $250,000.

ROLLING STOCK

Houston Electric Railway, Houston, Texas, has ordered four urban type coaches from the Twin Coach Corporation.

Milwaukee Electric Railway & Light Company, Milwaukee, Wis., has received five urban type Twin Coaches.

St. Louis Public Service Company, St. Louis, Mo., has purchased four urban Twin Coaches.

United Electric Railway, Providence, R. I., has ordered one gas-electric Twin Coach from the Twin Coach Company, Kent, Ohio.

TRACK AND LINE

Omaha & Council Bluffs Street Railway, Omaha, Neb., will spend approximately $26,000 in track improvement on Twentieth Street. Of this amount about $11,000 will be spent on curveouts, switches and other intersection equipment.

Pacific Gas & Electric Company, San Francisco, Cal., is inquiring for poles.

SHOPS AND BUILDINGS

New York, New Haven & Hartford Railroad, New Haven, Conn., plans a power plant at New London, Conn.

St. Louis Electric Terminal Railway, St. Louis, Mo., plans a terminal and freight building to cost about $1,000,000.

Puget Sound Power & Light Company, Seattle, Wash., has received a permit for a switching station.

Hartford Electric Light Company, Hartford, Conn., plans to purchase and install $200,000 worth of equipment to supply 5,000 kw. of additional power to the Connecticut Company, New Haven, Conn. The contract was signed on May 28.

TRADE NOTES

George F. Schlesinger, director of highways of the state of Ohio, has resigned his position effective June 15, 1928, and will become chief engineer and managing director of the National Paving Brick Manufacturers' Association on July 1, 1928. The headquarters of the association, which are now in Chicago, will be moved to Washington, D. C.

Ingersoll-Rand Company, General Electric Company and the American Locomotive Company have received an order to build jointly, three 300-hp. oil-electric locomotives for the Ashland Division of the American Rolling Mill Company.

Baker & Spencer, New York, on June 1, moved to 17 Battery Place, New York City.

ADVERTISING LITERATURE

Perey Manufacturing Company, New York, N. Y., has issued a folder entitled "How to Keep Out of Red Ink," descriptive of Perey turnstiles.

Heywood-Wakefield Company, Boston, Mass., has published a bus seat catalog illustrating a number of new ideas in bus seat construction including views of actual installations made.

Mitsubishi Electric Engineering Company, Japan, has issued Catalog C-166 on door engines. The descriptive matter is all in Japanese.

Sangamo Electric Company, Springfield, Ill., has published Bulletin No. 75 on its Type HB maximum demand register.

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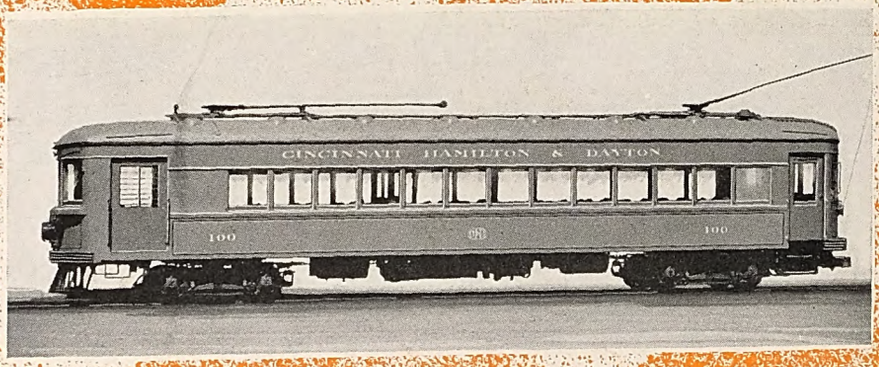


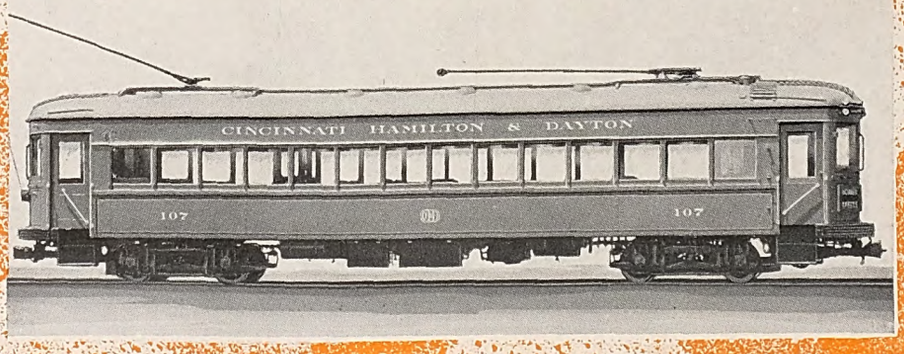
Improved Service Pays!

The gross revenue from the operation of the entire property of the Cincinnati, Hamilton & Dayton Railway during 1927 was 4.9 per cent greater than in 1926. This increase in business was obtained in face of the unusual economic conditions which prevailed.

New, modern cars were purchased from The G. C. Kuhlman Car Company early in 1927. According to the *Electric Railway Journal,* May 12, a very substantial and immediate increase in traffic resulted from this improved service and at the same time, marked reductions in operating expenses were effected.

Write for the Brill Car Catalog and learn why traffic responds to Brill Modern Cars.

THE J. G. BRILL COMPANY
PHILADELPHIA, PA.
AMERICAN CAR CO. ST. LOUIS MO. — G.C. KUHLMAN CAR CO. CLEVELAND, OHIO. — WASON MANF'G CO. SPRINGFIELD, MASS.



Brill Modern Cars

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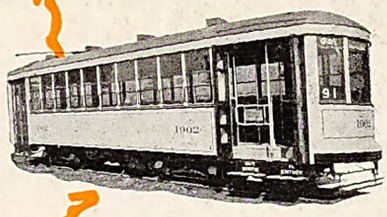
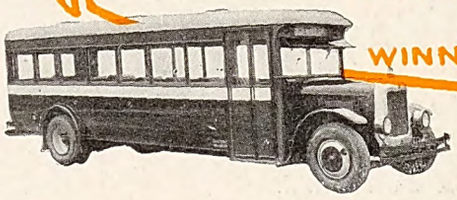
HASKELITE

On Canadian Street Cars . . and Buses . . .





Canadian National Railways Montreal, Que.

In 7 Diesel Cars HASKELITE used for roofs, baggage and passenger linings below windows, baggage room lining at windows, above windows and headlinings. PLYMETL used for engine room lining and sound-proof partitions. On a later order HASKELITE used for headlinings.

Hamilton Street Ry. Hamilton, Ont.

24 cars built by National Steel Car Co. with HASKELITE roofs, headlinings, PLYMETL sides and skirts.

Montreal Tramways Montreal, Que.

50 cars built by Canadian Car & Foundry with PLYMETL sides. HASKELITE used for ceilings of 50 cars built by Canadian Car & Foundry Co. PLYMETL used for repairs. 30 buses with HASKELITE headlinings and an articulated car with HASKELITE headlinings.

Saskatoon Street Ry. Saskatoon, Sask.

National Steel Car Corp., Ltd., used HASKELITE and PLYMETL on 4 cars for roofs, ceilings, frieze, vestibule frieze and side sheating below windows.

Quebec Street Ry. Co. Quebec, Que.

HASKELITE used for bulkheads and seat backs of Quebec Cars.

Buses in Many Cities

HASKELITE-equipped buses are operated in many Canadian cities including Toronto, Montreal, Hamilton and London. Among the companies operating such buses are:

- City of Hamilton (Hamilton)
- Dominion Power & Transmission Co. (Hamilton)
- Hamilton Street Railway Co. (Hamilton)
- London Street Railway Co. (London)
- Montreal Tramways (Montreal)
- Toronto Transportation Commission (Toronto)
- Winnipeg Electric Co. (Winnipeg)
- Temiskaming & Northern Ontario Ry. Co.

Haskelite Manufacturing Corporation
120 S. LaSalle Street, Chicago, Illinois

Railway Representatives:

Economy Electric Devices Co., 37 W. Van Buren St., Chicago. Grayson Bros., 600 LaSalle Bldg., St. Louis, Mo.
Railway & Power Engineering Corp., Ltd., Toronto, Ont., Canada

ERJ6-9-Gray

PLYMETL

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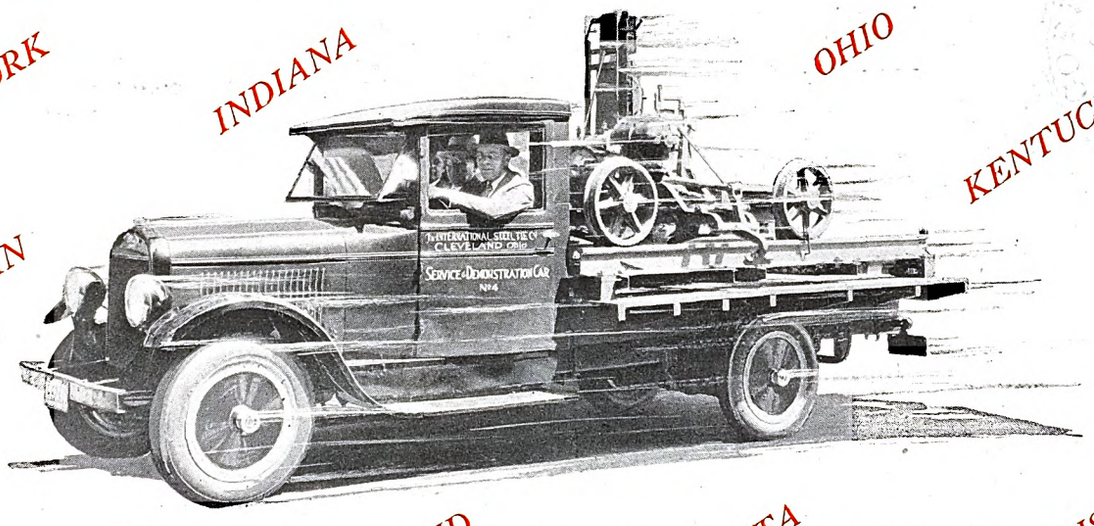
MAINTENANCE AND CONSTRUCTION ISSUE

ELECTRIC RAILWAY JOURNAL

cGraw-Hill Publishing Company, Inc. JUNE 16, 1928 Twenty Cents Per Copy

COMING YOUR WAY

NEW YORK INDIANA OHIO KENTUCKY MICHIGAN MISSOURI MARYLAND MINNESOTA ILLINOIS NEW JERSEY CONNECTICUT PENNSYLVANIA GEORGIA WISCONSIN MASSACHUSETTS



SPEED trucks carrying Compression Tampers and other track building equipment are now available for demonstrations and service. These trucks will carry direct to your property a compression tamper for demonstration. They're on the nation's highway now—one of them is in your territory—write or wire today and you'll have a demonstration—right on your job—under your own working conditions. There's no obligation, of course.

These trucks will also deliver compression tampers to your job, and call for them when the job's finished.

THE INTERNATIONAL STEEL TIE CO
CLEVELAND, OHIO

STEEL TWIN TIE TRACK
THE BASE OF MODERNIZATION

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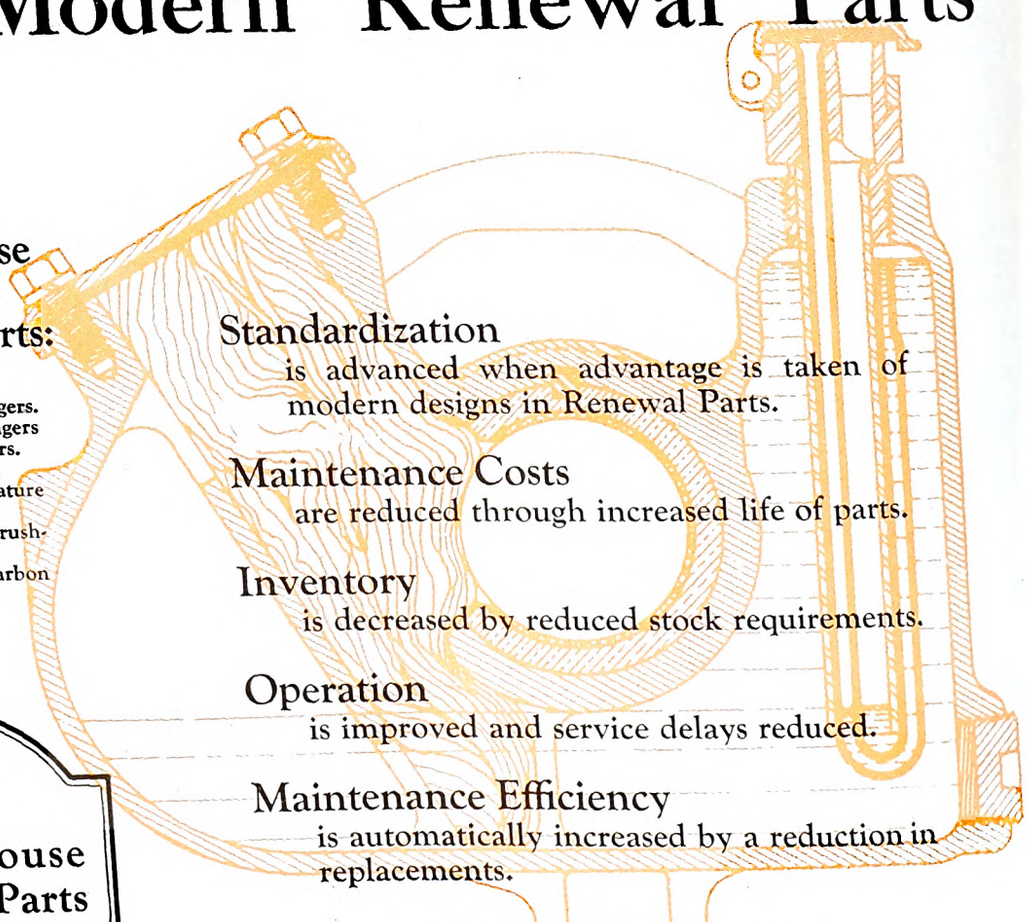
MAINTENANCE EFFICIENCY

is increased

by the greater use of

Modern Renewal Parts



A Few Westinghouse Modern Renewal Parts:

1 Compensating Fingers.
2 Twin Washer Fingers for Brushholders.
3 Oil Seal Housings.
4 Square Wire Armature Coils
5 Detachable Box Brush-holders
6 Westinghouse Carbon Brushes

Standardization
is advanced when advantage is taken of modern designs in Renewal Parts.

Maintenance Costs
are reduced through increased life of parts.

Inventory
is decreased by reduced stock requirements.

Operation
is improved and service delays reduced.

Maintenance Efficiency
is automatically increased by a reduction in replacements.

Westinghouse Renewal Parts *reduce* Maintenance Costs

Westinghouse Electric & Manufacturing Company
East Pittsburgh Pennsylvania
Sales Offices in All Principal Cities of the United States and Foreign Countries

MEMBER AMERICAN ELECTRIC RAILWAY MANUFACTURERS ASSOCIATION AERA 1928

Westinghouse

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Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

McGraw-Hill Publishing Co., Inc.
JAMES H. MCGRAW, *President*

LOUIS F. STOLL, *General Manager*
CHARLES GORDON, *Editor*

Volume 71 New York, Saturday, June 16, 1928 *Number 24*

A Symbol of Achievement

IN THIS issue ELECTRIC RAILWAY JOURNAL has the honor to reproduce for the first time the bronze plaque awarded by the Associated Business Papers, Inc., an association of 142 leading American business papers, for the most definite and outstanding editorial service rendered by an A.B.P. publication. This award was established in 1927 for the advancement of editorial standards.

Bronze plaque established by the Associated Business Papers, Inc., and awarded to the A.B.P. publication contributing the most definite and outstanding editorial service to its industry.

Announcement of the award to the JOURNAL was made at a combined meeting in Boston of the National Conference of Business Paper Editors and the educational committee of the Associated Business Papers, Inc., and was published in the Feb. 18, 1928, issue. The JOURNAL expressed its gratification at having been the means of directing national attention to the heroic struggle being made by electric railways to fight their way back to prosperity through what many times seemed to be insurmountable obstacles.

The trophy has just been completed. In the finished plaque the artist has caught the romance of industrial achievement and has represented the business publication in its proper role—that of inspiring industry to greater effort and broader vision. But to the men of the electric railway industry itself goes the credit for the actual progress that has been made, and the JOURNAL reproduces this trophy on its pages so that its readers may share with it this signal honor.

Improved Methods and Equipment Will Produce Needed Economies

DESCRIBING the economies that had resulted from a new piece of shop equipment he recently had installed, an equipment superintendent said last week, "Any master mechanic that does not take advantage of such a labor-saving device will certainly have something to explain to the general manager." The machine referred to had cost $200 and had paid for itself in a week's time. Yet few similar machines will be found in electric railway repair shops. Why is not more equipment of this type used? Why does not the master mechanic inquire about the value of such equipment, and then by figures and by discussion prove to his superiors its installation and intensive use will result in worth-while economies?

The expenditure of money for equipment that will produce economies far beyond the cost of the equipment merits consideration by all general managers of railways. Instead of taking the stand that expenditures must be reduced, that the present shop equipment must do for a few years longer, and that equipment which has served its purpose for many years must continue, the forward-looking general manager of today is of an investigating type. Whenever he reads or hears of a road that is obtaining real economies in maintenance he has his master mechanic investigate the methods employed and make a report as to those that can be adapted to advantage on his property. When a new piece of equipment is being used by another railway to better its work, reduce labor or speed up output, he asks his staff to determine if such a machine can be used to advantage. He insists on getting lower maintenance costs by the use of improved methods and equipment rather than by insisting that no expenditures be made for new tools.

Prosperity Comes to Canada

DELEGATES to the annual convention of the Canadian Electric Railway Association held at Toronto last week could not fail to be impressed by the feeling that the industry in that country has definitely turned the corner and is forging ahead. Last year at the Winnipeg convention there was an atmosphere of hopefulness. This year, after the progress in 1927, the railway operators are even more confident in the security of their business. The results for last year's operations were given by H. E. Weyman, president of the association, in his opening address, abstracted elsewhere in this issue. The revenues of Canadian electric railways and subsidiaries, as stated by him, were $48,290,000, an increase of 3.2 per cent from the previous year. Revenue passengers were up 3.75 per cent, while the amount of service was increased 6.5 per cent. These figures show a healthy growth.

It will not, however, be advisable for the managements to rest on their laurels. According to Mr. Weyman, the automobile has not yet reached its peak in Canada. The forward-looking attitude of the managements will do much to counteract any adverse influence from this source. As one of the speakers pointed out, the automobile has created a demand for transportation that must be met by public carriers, so that its use has certain compensating advantages. This is particularly true in a country which has the wonderful opportunity for expansion that exists in Canada.

This is the issue in June that is devoted essentially to maintenance and construction subjects

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Thorough Motor Inspection Will Reduce Cost of Intermediate Repairs

DIRT and moisture affect the reliability of motor performance to a greater extent than any other factors. Eliminate them and the maintenance of modern motors is comparatively easy. Maintenance methods should, therefore, be directed to keeping motors clean and dry. For this nothing is more effective than an efficient and regular inspection. A high-class system need not be expensive and its cost will be returned many times over by the reduction in repairs.

Inspection intervals for modern motors depend on the frequency of oiling. Motors with auxiliary oil wells should run at least 1,500 miles between armature bearing oilings. In city service this will bring them into the shop from twice to three times a month, and in heavy interurban service possibly once a week.

At these times the most effective way of removing dust is to blow it out with compressed air and wipe off the inside of the shell, the commutator, brush-holder insulators and brush-holders with cheesecloth. On one Southern railway that operates in extremely dusty territory it was found that the length of inspection periods was determined by the side wear of the carbon brushes. This side wear in the ventilated motors was caused by the large amount of dust that was sucked in with the air. The trouble was overcome by changing the method of ventilation and adding baffles to keep dust from the brush-holders. This is one example of the effect that dirt may have.

Use of better grades of insulation, together with dipping and baking of armatures and fields and liberal use of insulating varnish, have proved most effective for combating the effects of moisture. When motors operate in a damp climate painting and shellacking should form a part of the regular inspection. Cleaning, of course, should always precede the painting, and sufficient time for drying should also be allowed.

This may sound like a lot of work to be covered on motor inspection but it has been found to pay. On one system, after a year of this kind of inspection practice, the number of armatures removed and sent to the armature room for repairs had decreased 70 per cent and the repair bills for the entire year following showed a nearly proportionate decrease. The average cost of repairs, including bearing renewals, was reduced in the ratio of 5 to 2 with an increase in motor inspection expense of but one dollar per motor. This certainly is a good return on the investment and shows that the cost of intermediate repairs to motors can be reduced by more careful inspections.

Be There and Speak Up

LACK of representation at meetings of local bodies where their interests to a certain degree are concerned is costing many electric railways the loss of important issues and, if nothing more tangible, the loss of public confidence. Even the failure to attend meetings where transportation is not discussed is costly, for a feeling develops that the electric railway is interested only in problems which affect its own welfare. Participation in as many activities as possible and being a working unit of each community organization, not merely a member, will bear fruit when some issue of importance to the transportation system is decided.

At meetings of civic clubs automobile associations are always well represented. Their members attend in large numbers and never fail to be there *en masse* when "parking restrictions" or "street paving" are to be discussed. But whether the subjects interest them or not, they are present and their influence in the organization becomes established. Local improvement associations always make transportation a live subject. Nearly every company will find some member of its organization lives in the territory of each association, and should encourage him to be an active member. It behooves the electric railways, then, to be represented at all meetings and to be represented as fully as possible.

In the interests of its patrons, the transport company should make its force felt at these meetings. Mere attendance is not a discharge of the obligation; the representative must make his influence known. To use the words of E. K. Eastham, safety director of the St. Louis Public Service Company, who recently spoke at the Electric Railway and Public Utilities session of the Central States Safety Congress, "By all means be represented at every gathering where matters of public interest are to be discussed or decided, and don't be afraid to stand up and be counted." In many cities civic groups seek the counsel of the electric railway company. They do so because the company has earned respect and secured public confidence at meetings in which it took a really active part.

"Busy at the office" is not an acceptable excuse for the railway executive. Perhaps he is busy, but so are many others who attend. It is a grave and costly mistake to conceive of public interest meetings as a waste of time. Indeed, if the management is too busy, or as Mr. Eastham mentioned, "too pennywise," to attend these meetings and make the force of the electric railway and its patrons felt, it cannot expect to receive its just share of consideration when any subject affecting it is under discussion.

A Hundred Pounds of Sugar at a Time—Or Four Pounds

FROM a maintenance point of view the well-known axiom, "It pays well to build well," holds true. Another axiom not heard so frequently, but nevertheless just as important, is, "It pays well to buy wisely." Certainly careful purchasing, with respect to quantity as well as to quality, cannot be over-emphasized. It is of particular importance in every branch of industry, and electric railways are no exception.

The cost of careless ordering can be sufficient to cause the budgets of several departments to be over-spent. Just as the judicious housewife buys a 100-lb. sack of sugar for $5.50, instead of 25 four-pound lots at 7 cents per pound, totaling $7, and a 3-bushel bag of potatoes for $4.50, instead of 30 six-pound lots at 4 cents per pound, totaling $7.20, so should the purchasing agent of the railway save by buying in large amounts.

While there are possibilities of saving in purchasing methods in nearly every department, naturally the greatest opportunities are in connection with maintenance materials. Certain bulky materials, such as sand and gravel used in track reconstruction and maintenance work, are costly when purchased in small quantity. Not only is the cost per cubic yard at the pit much higher when sand and gravel are purchased in small amounts, but also the cost per cubic yard for hauling them to the property is greater. Where there is a demand for a material the year round, it is folly to buy in amounts

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only sufficient for each individual job. Wherever possible, it should be shipped by carload or barge amounts. A large electric railway system in the East receives all its sand and gravel on barges, and handles the material at the wharf with large cranes. The resulting saving in a year is enormous.

Repair parts must be ordered wisely. It is absurd to think of a large railway ordering, for example, one bolt or even one standard size rail. Yet there are actual cases that are equally ridiculous. Nearly all shop parts are needed in quantity, so there are few instances where the ordering of one or two individual parts is warranted. The cost of shipping individual parts often is much higher than the actual cost of the part itself. Manufacturers, generally speaking, do not accept with open arms the small orders. To them small orders are nothing more than a nuisance.

Of course, the other extreme can be reached. Parts or materials should not be bought in large quantities if they will become obsolete before they are all used, nor if they will deteriorate with age. Materials which occupy much space should not be bought in quantity if the cost of storage is more than the saving realized thereby. Like anything else, quantity purchasing can be overdone and the purchasing agent should be careful to avoid making an error in this respect. Ordinarily, however, the opposite holds true and materials are purchased in too small amounts. Good judgment in ordering materials is necessary if savings are to be effected.

Another Argument for New Equipment Is 30 to 1 Dependability

WHEN the subject of new equipment is being discussed, one of the most important advantages frequently is either overlooked or is not given the emphasis it deserves. That is the saving in maintenance and operating costs made possible when old and wornout parts are replaced by new ones. There is still another advantage in the improvements that are embodied in the more recent designs of parts of various sorts which lead to a reduction in the number of failures.

These points are emphasized by the experience of the Georgia Power Company, as related by W. H. McAloney in an article in this issue. This company has been replacing old cars with new ones ever since 1921. Besides this it has been replacing old motors with new where it was decided the cars were good enough to continue in service. A total of 426 old motors have been retired, while at the same time 848 light-weight modern motors have been placed in service. A part of this increase is on account of the purchase of new cars, but the greater part was because of the replacement of old two-motor equipments with new four-motor equipments.

Statistics kept by the mechanical department show that in the past five years 110 per cent of the armatures of the old motors have been rewound, while only 0.019 per cent of the new motors have required it. In 1927 the miles per rewind for the old motors averaged 307,163 as compared with 10,646,741 for the new ones. In other words the reliability of the new was about 30 times as great as that of the old. Of course as the new motors become old it cannot be hoped that they will continue this remarkable record, but it will be a number of years until they fall to the level of the old ones. Incidentally, improvements in the methods of overhauling have increased the mileage of the first lots of the new-type motors.

This is concrete evidence of the value of modernization. It covers only one element, but an important one. However, it is almost certain that other items of maintenance have been improved proportionately. Beside all this there is the increased reliability in service and freedom from breakdowns on the street. These are things that cannot be estimated in dollars. They should appeal to the general manager with the greatest force.

Bus Expansion Built on Profits in Pittsburgh

ATTENTION is focused again on the operations of the Pittsburgh Motor Coach Company, Pittsburgh, Pa., by the announcement of the establishment by that company of its fifth de luxe motor coach line. Like its predecessors, the new service is run at a 25-cent cash fare, with 21 tickets for $5. The route is 7 miles long. It connects a high-class residential district with the downtown business section.

There are, of course, very good reasons why the company confines bus operation to service of this class. T. W. Noonan, general manager, made them plain in his speech before the Central Electric Railway Association in Toledo in February, 1927. Some may or may not agree with the philosophy behind the plan, but it has produced results. This is borne out by the report of the company, abstracted in the JOURNAL for April 21, 1928. Income from buses, before allowing for depreciation, was $107,805. Out of this $62,848 was set aside for depreciation, leaving a net of $44,957. The revenue per passenger coach-mile was 36.82 cents with the average fare 24.70 cents. The gross was $483,569.

In developing its bus service, the Pittsburgh management deliberately set out to create an entirely different class of service than can possibly be given by a low-fare electric railway service, or for that matter a low-fare bus service. The management recognized that economy is not a primary appeal to the habitual private automobile user. Convenience, speed, exclusiveness, and even luxury, are of far more importance to this class of bus prospect and Pittsburgh has proved it. The vehicles run are of small capacity, three seats wide and operated on short headways. An effort is made to give the passenger the impression of riding in an exclusive limousine rather than in a public transportation vehicle. Early in its experience, the company changed from 29-seat buses to 19-seat vehicles and earnings went up immediately.

The economy of larger seating capacity, particularly in the rush hours, cannot be gainsaid, but the fact remains that the present successful operation seems to be attributable to the use of small vehicles run at frequent intervals in a service that really is de luxe.

The Pittsburgh Railways is running its bus subsidiary intensively. The line of demarcation of responsibility for its operation is sharply drawn. There is no disposition on its part to regard bus service as an orphan for which only occasional concern is expressed. Mr. Noonan's paper of more than a year ago made that plain. The separate report of the operation of the Pittsburgh Motor Coach Company contained in the JOURNAL for April 21 proves the far-sightedness of this policy and points the way toward making buses in city service really profitable.

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Careful Overhauling of Motors

Prevents Service Interruptions*

With several cars in a rapid transit train a disabled motor may cause delay and inconvenience to hundreds. Motor overhauling in the Coney Island shops of the Brooklyn-Manhattan Transit Lines is planned to prevent failures on the road. The most modern practices are used

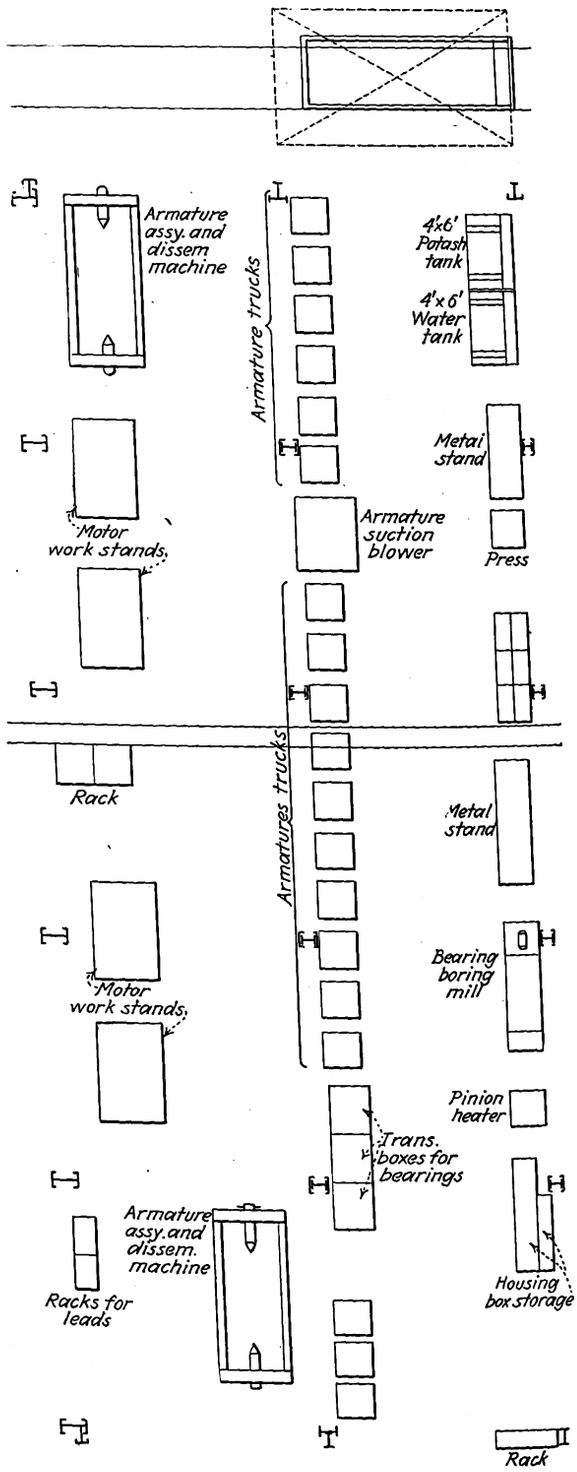
By Clarence W. Squier
Associate Editor *Electric Railway Journal*

HIGHLY systematized methods are used throughout the motor overhauling department in the Coney Island shops of the Brooklyn-Manhattan Transit Lines. This work is done in two bays each 20 ft. wide by 100 ft. long. Over each bay is a 5-ton overhead traveling crane controlled from the floor. Motors are lifted off trucks at one end of the section when the trucks go through the shops for general overhauling. The department also does intermediate repairs to motors when it is necessary to remove them from trucks. This section is adjacent to the truck overhauling department so that handling is kept to a minimum.

All motors are of a box-frame type. This is of particular value in standardizing the work. The first thing done when a motor is received in this department is to pull waste from axle caps and armature bearing housings and drain off the oil. The oil and waste are placed in steel drums and go to the oil and waste reclaiming department. Next, for removal of armatures, the motors are placed in a dismantling and assembling machine, of which there are two in the section. One is used for taking out armatures and the other, at the opposite end of the section, is used for assembling.

The machines are of a type quite generally used by electric railways for the purpose. The base has two 9-in. channels 12 ft. 3 in. long. These serve as tracks for the carriage which supports the motor shell. End uprights of ½x4-in. steel support a headstock and a tailstock with spindles with coned ends to fit in the centers of the armature shaft. The carriage has a spindle with collars at one side over which the motor axle bearing suspension fits. At the other side the carriage has a supporting framework with a plate to support the nose of the motor. The motor is thus supported on the carriage, the same as it ordinarily is on the car truck. Accompanying illustrations show the construction.

To remove an armature the motor is placed on the carriage, the shaft is centered in the head and tailstocks and locked in position. The pinion end housing is then unbolted and the motor shell as it rests on the carriage is pushed in the direction of the commutator end of the frame. The long spindle passes through the motor shell. The commutator end housing remains with the motor shell, but the pinion-end housing stays on the armature



Floor plan of the section in the Coney Island shops devoted to motor overhauling

**This is the fourth article on methods and equipment used in the Coney Island shops of the B.-M.T. Corporation. Others were "Truck Overhauling," published April 21, 1928; "Intermediate Truck Repairs," published May 5, 1928, and "Wheel, Gear and Axle Maintenance," published May 19, 1928.*

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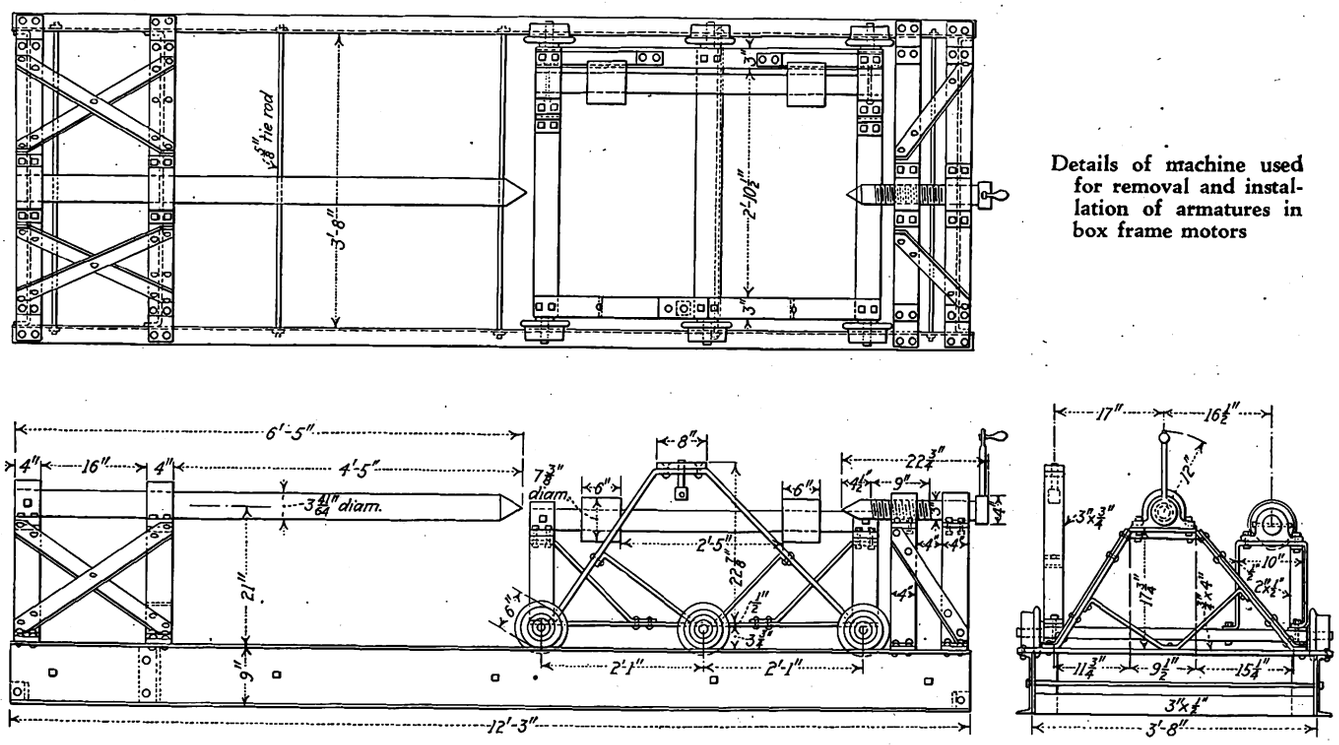
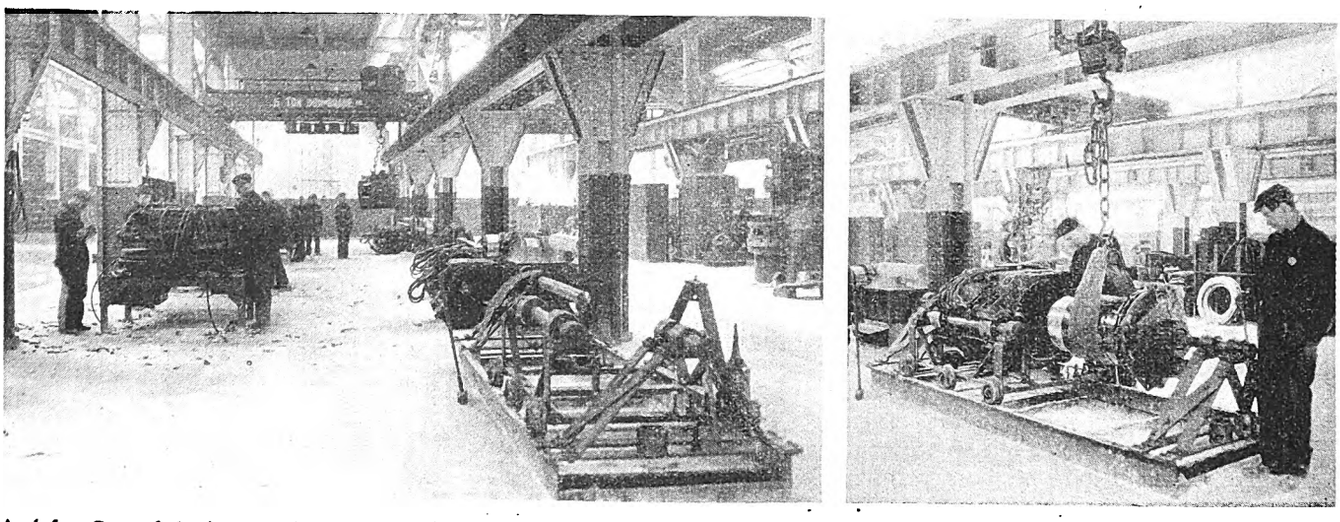


Details of machine used for removal and installation of armatures in box frame motors



At left—One of the bays in the motor overhauling section. The machine for installing armatures in box-frame motors is shown in the foreground. At right—Installing an armature in a box frame motor

shaft until the pinion is removed. When the motor shell has cleared the armature, the latter is lifted out by the overhead traveling crane and is placed on an armature truck. In handling, a sling with a broad supporting surface is passed around the armature at its center. Pinions are removed by means of a pinion puller, end housings are removed and the armature is sent to the department of electrical repairs for cleaning, testing and repairing if necessary. Several armature trucks are towed together by one of a large fleet of storage battery trucks.

Two general types of armature trucks are used. One is of sheet steel construction with three wheels. The center framework forms a cradle to carry the armature. The second has an angle-iron framework with cast steel ends hollowed out to receive the armature shaft ends. There are four wheels, an 8-in. one on either side at the center and one 4-in. wheel in the center at each end. This latter truck is particularly convenient for handling armatures into and out of the baking ovens.

An armature suction blower is to be installed in the motor overhauling section for cleaning. When this is ready armatures will be cleaned before they are sent to the department of electrical repairs.

The end housings are taken to a motor-driven hydraulic press where the armature bearings are pressed out. Housings and axle caps are then placed in a chemical cleaning tank where they remain for about 1½ hours. There are two tanks each 4 ft. x 6 ft. x 3 ft. 6 in. high. One has the chemical cleaning solution and the other has water for rinsing. After cleaning, the housings and axle caps are wiped, inspected and gaged for wear, defects or needed repairs. If they pass the test they are then ready for re-use. All bearings are sent to the babbitting department.

Motor frames are overhauled on work stands. Brushholders are removed and sent to the department of electrical repairs for general overhauling and adjusting. All connections to and between field coils are broken and a careful inspection is made for loose joints. Fields are tested from the 600-volt shop circuit. Any that show

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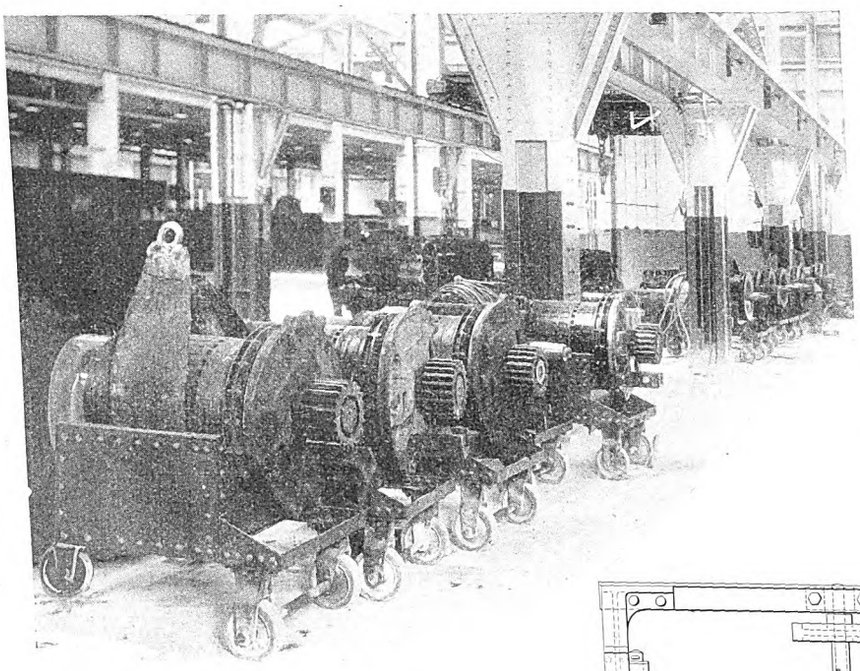
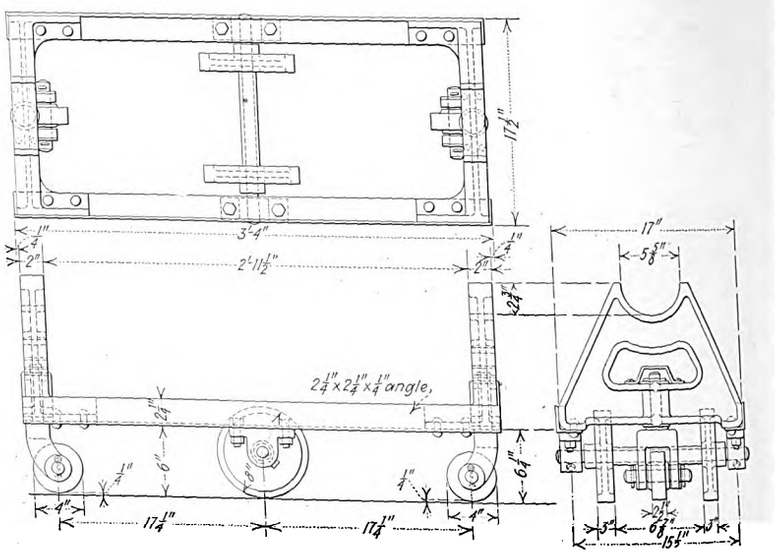


Armatures are transported between the motor overhauling section and the department of electrical repairs on trucks

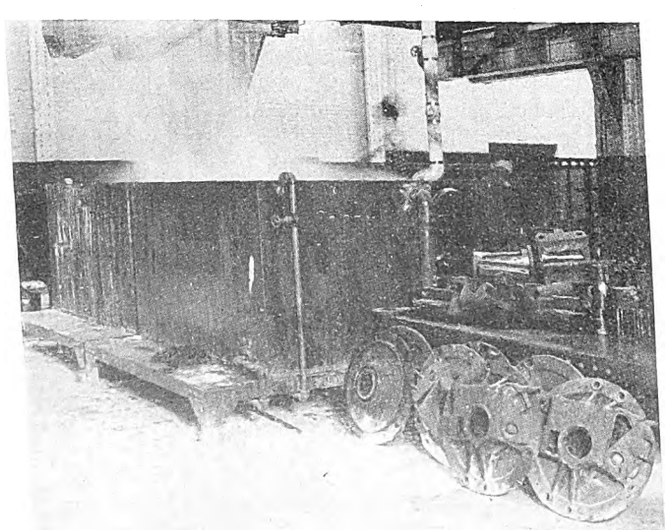
signs of short circuits or grounds are removed and sent to the department of electrical repairs. Field coils passing this inspection are not removed from the motor frames. After repair, connections are made again and the entire inside of the frame and the field coils is given a coat of insulating varnish.

Some of the motor frame overhauling is done on stands to raise the parts to a convenient height for the workmen. The stands are 5x8 ft. with a structural steel framework. Each has space for two motors. Special overhauling stands, shown in one of the illustrations arranged so the motor can be turned to any position desired, are used for most of the overhauling. Two circular end plates are bolted to the motor frame by means of the bolt holes used for fastening the armature housings in position. The end plates rest on bottom supports with rollers, so that the motor frame can be rotated readily. The base is 3 ft. $10\frac{3}{4}$ in. long by 3 ft. 4 in. wide and the center of the motor frame is 3 ft. 7 in. above the base, which rests on the floor.

In general the motors now in use on the B.-M.T. subway cars have not been in service long enough to have excessively worn axle-cap or armature-housing fits. However, these are all gaged carefully to make certain that there is no excessive wear. In some motors a slight warping has occurred in the motor suspension projectors to which the axle caps fit. When this is enough to cause improper alignment or fit of the axle bearing, low spots are built by welding, the fit for the axle caps is planed off and the frames are rebored. This work is done in the machine shop section.



Type of armature truck used for running armatures into baking ovens



Chemical cleaning and rinsing tanks. Housings and axle caps are cleaned here

An accompanying illustration shows a motor frame set up in a planer for machining off the axle cap fit. Another shows a motor frame in the double spindle boring mill having the axle bearing fits bored out. The large 48-in. planer was furnished by the C. A. Gray Company, Cincinnati, Ohio. It has a 12-ft. table and three heads for holding tools, two on the cross rail and the other on the side of the column for facing and side cutting. All heads have automatic feed in either a horizontal or a vertical direction and they can be turned to any angle required by the work. The cross rail and all heads are raised and lowered mechanically. All bearing surfaces have forced-feed lubrication.

The double-spindle horizontal boring mill, furnished by the Giddings & Lewis Machine Tool Company, Fond du Lac, Wis., has special attachments for boring at one time both the axle-cap and the armature-housing fits for the subway type motors. All adjustments are made mechanically. The machine can be used as a single spindle boring mill by removing the extra plate from the table, which carries two boring bars, and by taking off the double spindle boring attachment at the driving end.

The practice of the B.-M. T. Lines is to bore arma-

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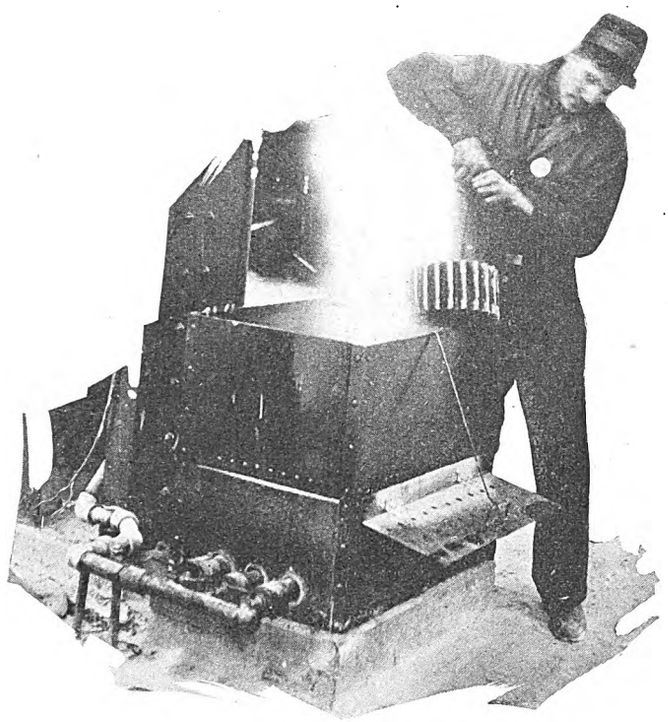
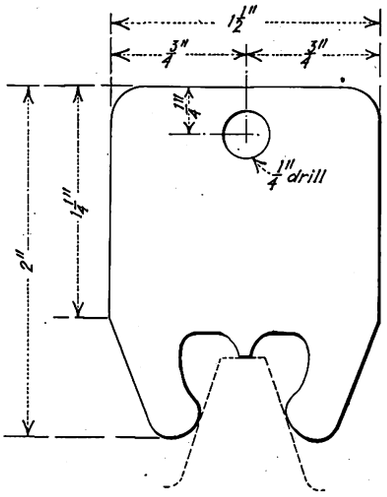
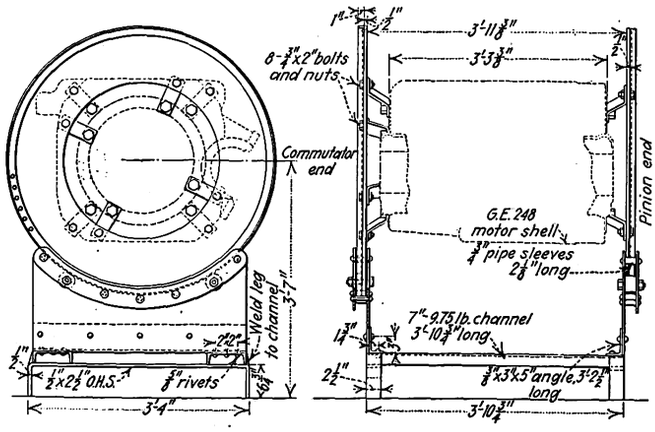


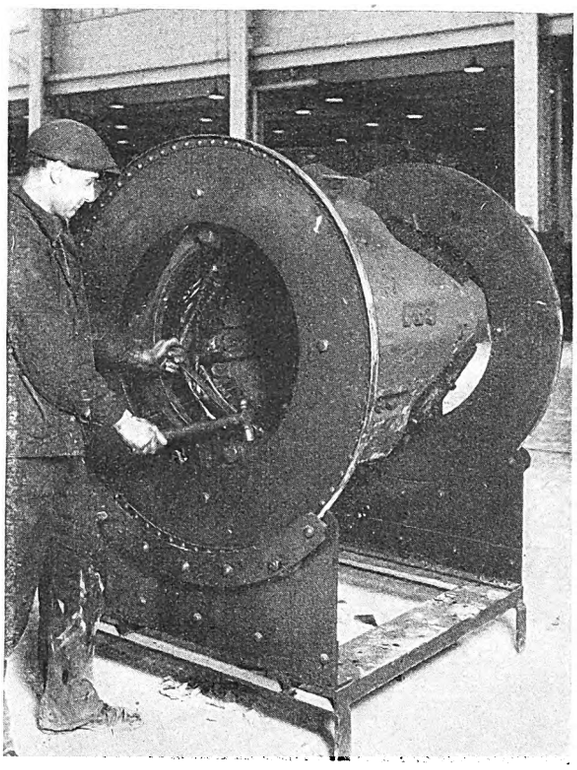
Removing a pinion from the hot water tank for installation on armature shaft



Limit of wear gage for gears and pinions



Details of rotating motor shell work stand

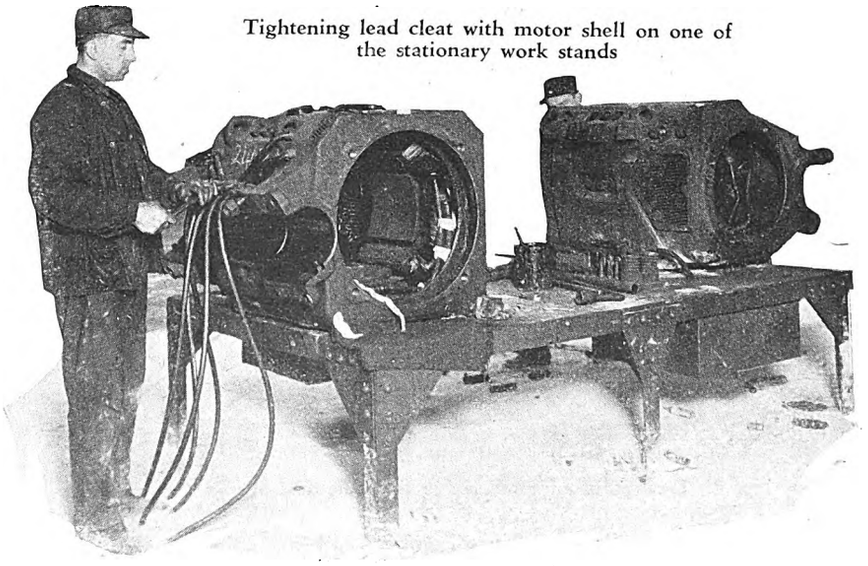


Working on a motor shell after installation in the rotating work stand

ture bearings after they are pressed into housings. The bearings have a thin babbitt lining with cast-in oil grooves. This eliminates handling of the large end housings to cut oil grooves after the bearings are bored. Each bearing is fitted to the armature shaft with which it is to be used. Bearings are pressed into housings with a motor-operated hydraulic press. A gage shows the pressure as each bearing is pressed in. An average pressure of 5 tons is used.

Illustrations show the jig used to insure accurate boring of the bearings after they are pressed into housings. This will take both the pinion end and commutator end housings for three different types of motors, Westinghouse types 300 and 50-L and General Electric type GE-248. The jig really consists of

Tightening lead cleat with motor shell on one of the stationary work stands



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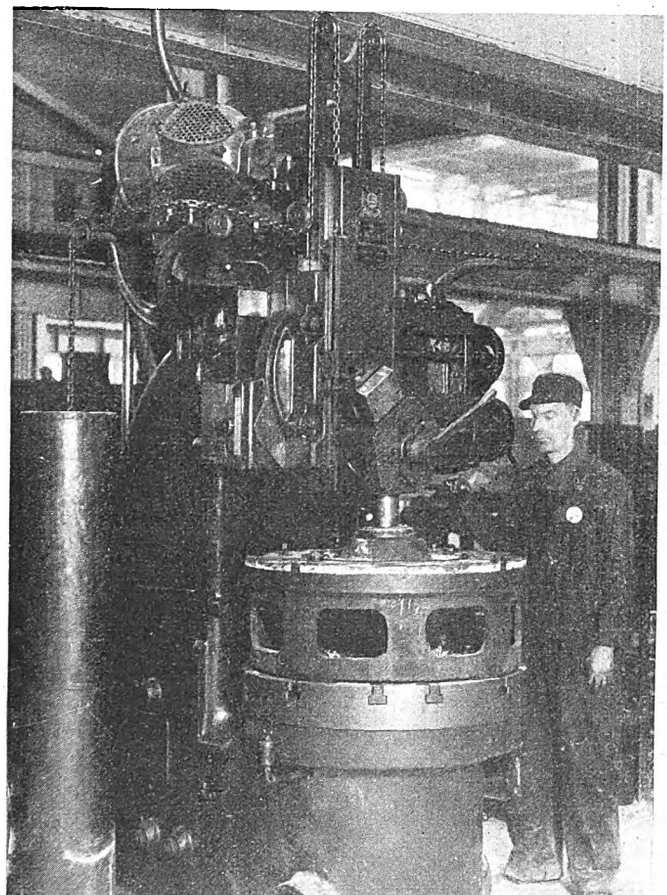
two fixtures, an inner and an outer one, the inner one being used for 50-L housings and the outer one for types 248 and 300 housings. Both fixtures are centered accurately on the face plate of the boring mill by slots and keys. The inside fits into which the housings go were bored out on the machine with which they are used. They are $\frac{1}{32}$ in. larger in diameter than the housings.

The inside fixture has three locking arms and three indexed set screws. The locking arms center the housing to be bored and the set screws are then tightened until the index on each is the same. This insures accurate centering of the housing with respect to its fit in the motor shell.

The outside fixture has four gage rings, one for use



Boring out an armature bearing after it has been pressed into housing. A special jig is used for centering the housing accurately

with each of the four different types of housings that are bored in the jig. The gage rings are centered accurately and locked in position by a set of indexed screws which move centering pins into position by the action of beveled surfaces. When a ring is centered accurately all the indices are the same.

Great care is used in the removal and installation of pinions. Pinions are heated in a hot-water tank so that the bores are expanded previous to installation. All teeth are gaged for wear. A discard gage used to determine the scrapping limit is illustrated. When the top projection touches the end of a tooth, the limit of wear has been reached.

A feature of the motor overhauling section is the provision made for storing parts used in overhauling adjacent to the work. Motor leads are cut to exact dimensions and stored in racks. Locked cabinets contain brush-holders, bearings, connectors and other brass or copper parts. Storage racks are used for housings and axle caps and locked boxes hold the overhauling tools.

New Quarters Occupied by Brooklyn Companies

OFFICIAL transfer of the general offices of the Brooklyn-Manhattan Transit Corporation and the Brooklyn City Railroad to the new Paramount Theater Building at 385 Flatbush Avenue Extension, corner of De Kalb Avenue, Brooklyn, on May 14 was preceded by a moving period of ten days, in which the various departments transferred their office equipment and records to their new quarters and on Tuesday, May 15, the old headquarters at Montague, Clinton and Remsen Streets were turned over to their new owners.

The B.-M. T. system occupies the fifth to the eleventh floors, inclusive, in the new office building. The Brooklyn City Railroad occupies the third and fourth floors. Each company has its own separate telephone exchange in the new building, the new general office telephone number for the B.-M. T. system being Cumberland 6200, while that for the Brooklyn City Railroad is Cumberland 7100.

The transfer marks the passing of 85 Clinton Street and 168 Montague Street as the headquarters for transit activities in Brooklyn. The building at 85 Clinton Street was occupied by the old Brooklyn Rapid Transit organization in August, 1905. It was erected to provide a central building for the various departments of that organization which had gradually absorbed all but one of the various railways in Brooklyn at that time. Prior to that time 168 Montague Street had been the main office building but as the central organization had expanded while the B. R. T. system increased in size the Montague Street building proved inadequate. In fact prior to August, 1905, several departments of the B. R. T. system were located in the old Franklin Trust Company Building, 185 Montague Street, and at various places around the system. When the building at 85 Clinton Street was erected the lower floors were connected with the Montague Street Building so that the two were occupied as a single building.

The building at 168 Montague Street was first occupied by the Brooklyn City Railroad in May, 1892, when the company moved to the Borough Hall section from its old headquarters at 8-10 Fulton Street near Fulton Ferry. The Brooklyn Bridge had already begun to make its importance as a traffic artery felt on the ferries to Manhattan and Fulton Street and the ferry was losing its prestige as the business center of Brooklyn. When the Brooklyn City Railroad first moved to 168 Montague Street, it was on the extreme western edge of the Borough Hall business district as west of Clinton Street there were nothing but private residences along Montague Street. In 1893 the Brooklyn City Railroad turned the building over to the Brooklyn Heights Railroad in connection with the lease of its property to the Brooklyn Heights Railroad and the building was occupied by the B. R. T. system until October, 1919. At that time, the Brooklyn City Railroad resumed independent operation of its surface lines and its executive offices returned to 168 Montague Street.

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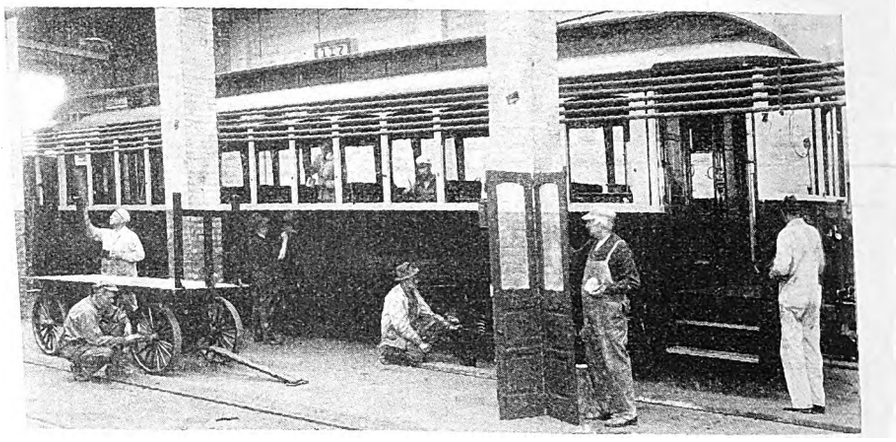
Solving the Car Painting Problem in Seashore Climate

SALT AIR, bright sun and sand-laden winds create an extremely serious car painting problem for the Atlantic City & Shore Railroad, Atlantic City, N. J. The wind, carrying fine particles of sand in suspension, has almost the same effect on the exterior car paint as a compressed air sand blast would. Evidence of its destructiveness is found on the front dashers of the cars, where the paint first begins to show the effect of the climate. The moist, salty, air quickly causes corrosion of the steel side sheathing of the cars unless it is kept well painted all the time. The bright sun soon fades most kinds and colors of paint. Only by giving continuous attention to the matter of car painting has the company been able to keep its rolling stock good looking.



Car of the Atlantic City & Shore Railroad in process of being repainted "burning bush orange" with cream window posts

Cars are repainted about once in twenty months. Last year 87 cars out of a total of 125 on the property were repainted. "Burning bush orange" is a new color recently selected to replace a lighter shade of orange. Window posts are painted cream color. On account of its ability to withstand bright sunshine the new color gives better visibility to the rolling stock and creates a more attractive appearance as well. Lacquers and enamels of various kinds have been tried on the exterior of the cars of this company without much success. The old-fashioned paint and varnish process is now believed by J. W. Gordon, master mechanic, to be the best suited to meet the difficult conditions at Atlantic City.

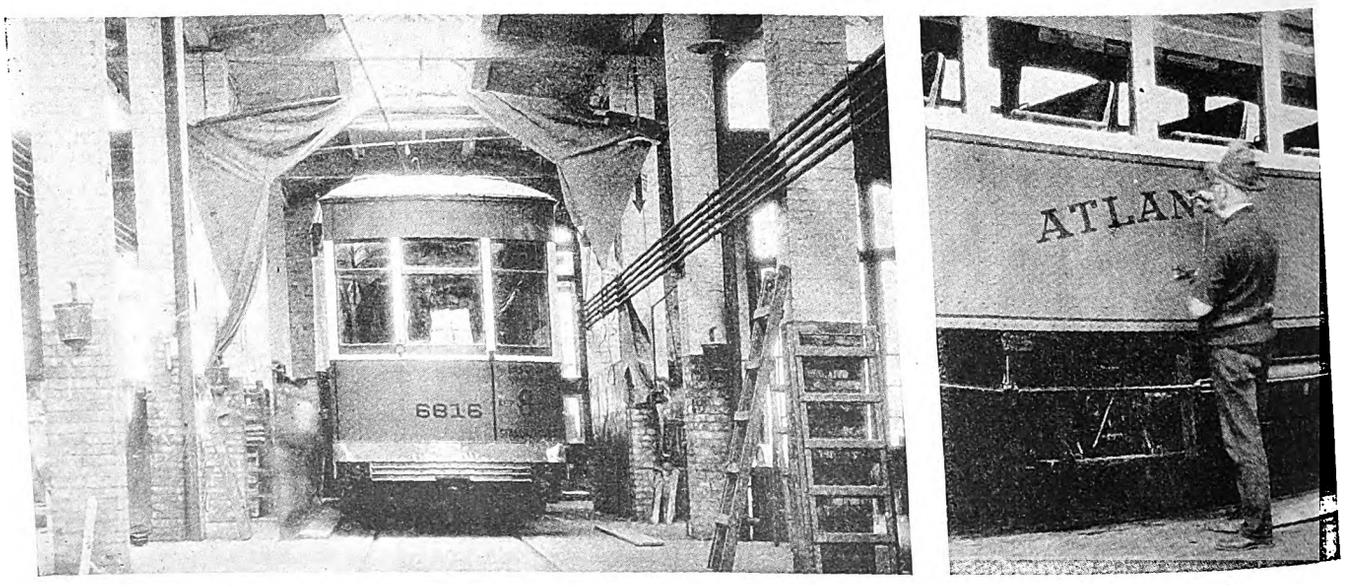
If the car comes into the paint shop with the paint in poor condition, it is all burned off. If the old paint is in fair condition the exterior of the car is sanded down, puttied and glazed. Twelve hours later a coat of priming paint is applied. This is sanded down and a coat of flat color put on. The next day the car is given a second coat and the following day a third coat of flat color.

The car is then ready for striping and numbering. This is done in black by hand. At the same time the pole, trolley base, bumpers and running gear are painted black. After this has been completed three coats of varnish are applied twenty-four hours apart. No rubbing varnish is used. Paints are mixed by hand in the railway shop, ingredients being purchased in bulk. The pigments are ground in Japan. Only the highest quality material and best grade linseed oil are used.

Keeping the interior of the car in good condition is not a serious problem. When the car comes to the shop for painting the interior is sanded and varnished. The seats are scrubbed and the floor is painted. Interior electrical equipment is painted in black.

The paint shop force consists of six men. The capacity of the shop is four cars but ordinarily not more than three jobs are under way at any one time. Each job takes from a week to ten days, depending largely on the condition of the old paint and the amount of puttying and glazing necessary.

It is felt by the management that attractive appearance is an important asset in selling transportation, and no effort is spared by the Atlantic City & Shore Railroad to keep its cars attractive in appearance despite the difficult climatic conditions.



At left—After three coats of flat color have been applied and lettering and striping done, the car is given three coats of varnish. At right—Lettering and striping are done by hand

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Cologne Lays Tracks Without Ties

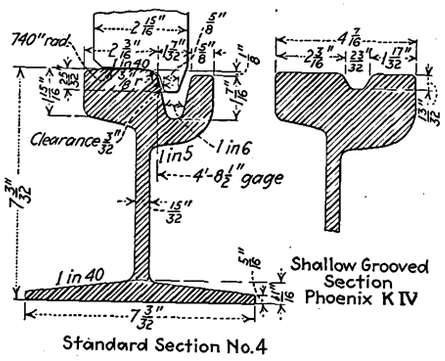
Present standards in Cologne call for the use of concrete beams in paved streets. The rails rest on an elastic filler and are held to gage by tie rods. On reservations and on curves the beams are omitted

By R. Schwanter

Assistant Engineer City Transit Board, Cologne, Germany

FOLLOWING a trip through the principal cities in the Eastern part of the United States, in which I studied transportation methods, I take this means of expressing my appreciation for all the kindnesses shown me by railway officials and others who allowed me to inspect their systems. In part return, I shall describe some features of German street railway track construction, as exemplified in Cologne. As the reader will see, it differs radically from the methods usually followed in America.

Incidentally, I found during my trip in the United States that although American double-truck cars have a much lower axle load than our single-truck cars, our cars run much more smoothly. The principal reason for this



Figs. 1 and 2—Standard rail section No. 4 and shallow groove section for special work, used in Cologne

is that our rails have a resilient support. Great effort is being made also in Germany to reduce the unsprung weight of the car on the track, as well as the number of rail joints.

The usual method of joining rail ends both in straight track and in special work is by the thermit weld. Often as many as 5 miles of rail is welded in one section.

The most generally used rail and wheel section are shown in Fig. 1. Attention is directed to the very small clearance between the flange of the wheel and the side of the rail head. The purpose of this is to prevent nosing by the cars.

The Cologne Street Railway makes most of the built-up special trackwork used on its system. The rails employed in special work are of the shallow or flange-bearing section, shown in Fig. 2. A piece of special work, such as a frog, is built up of one such through-running, shallow-grooved rail and two adjoining similar rail sections, which are first set up on a common bedplate, where they are held in position by bolts (Fig. 3). Then the groove is cut through by a shaper and it is deepened at all four outer ends for the smooth entrance and exit of the wheels. The rail bases are then electrically welded to the bedplate, and the splice bars to the rail. Owing to the conical shape of the wheel flange, the gage of the frogs must be narrower than the gage in straight track.

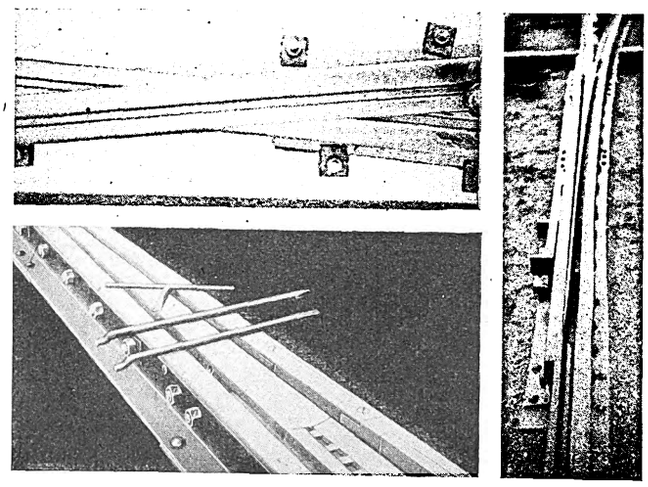


Fig. 3 (top left)—Shallow groove rails, bolted up for special work before being milled
Fig. 4 (bottom left)—Heel of switch tongue of pivot type, with tools to take up the tongue
Fig. 5 (right)—Switch tongue, with transition curve form

Among the latest switches used in Cologne are those of the Vereinigte Stahlwerke, Hütte Ruhrort-Meiderich (Phoenix) with removable heel-bearing tongues (Fig. 4). All curves and all switch tongues are laid out according to standard transition curves. A typical switch is shown in Fig. 5.

The standard method of track construction for straight track in asphalted pavement on a concrete base in Cologne is shown in Fig. 6. As will be seen, the rails are mounted on concrete beams or stringers, with a special rail filler between the rail base and the stringer to provide resiliency in the track. After the concrete beam is laid,

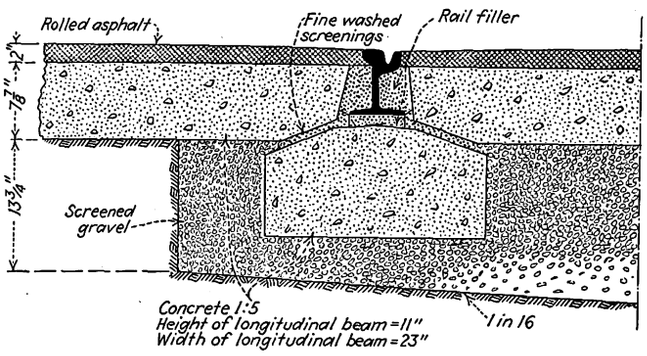


Fig. 6—In standard tangent track construction, the rail is supported by an elastic filler on a longitudinal concrete base

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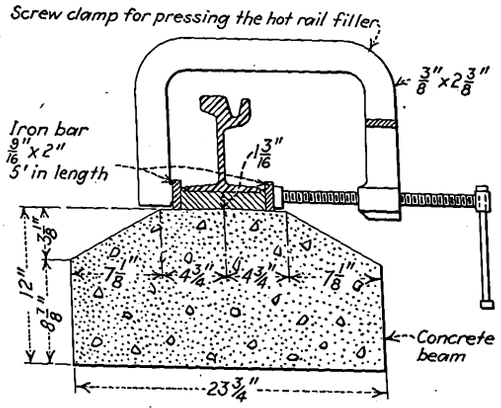


Fig. 7—The elastic filler is tamped under the rail, then molded on the side by long iron bars, pressed in by screw clamps

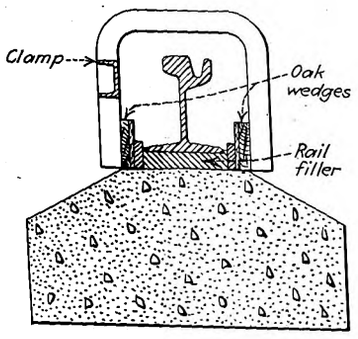


Fig. 9—As the screw clamps are removed, U-shaped clamps with oak wedges are substituted

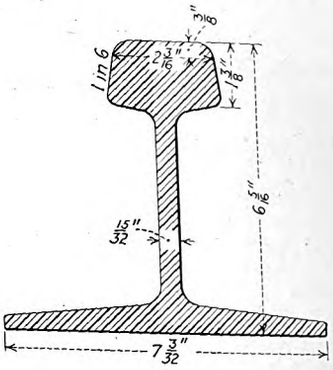


Fig. 13—On reservations, this T rail is used. As will be seen, it has a very wide base

Fig. 8—Appearance of the screw clamps shown in Fig. 7

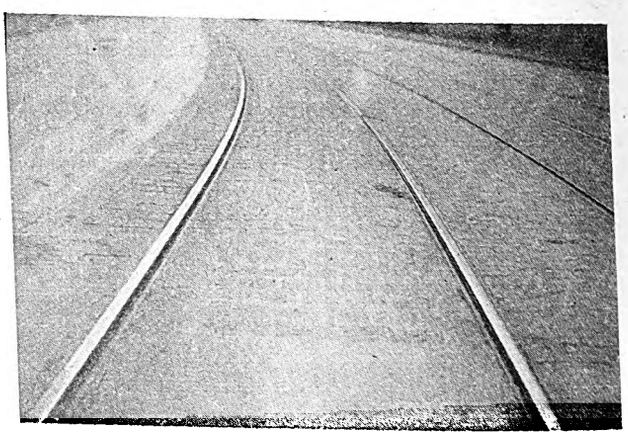


Fig. 12—Finished curve track construction

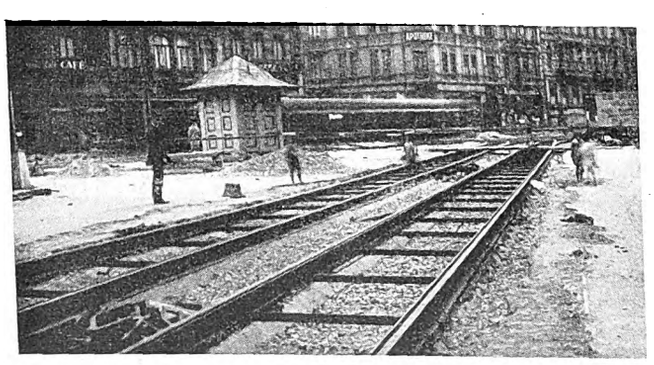


Fig. 10—Tangent track on concrete base with resilient filler and tie rods, before the installation of paving

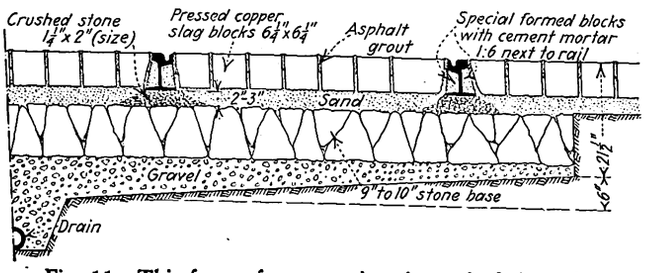
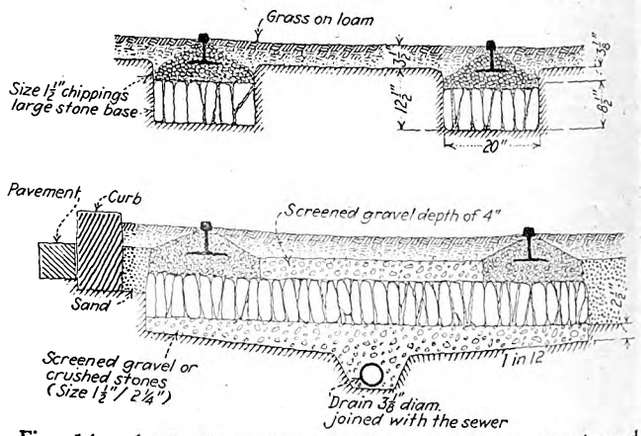


Fig. 11—This form of construction, instead of that with a concrete base, is used on curves

the rails are placed upon it, resting upon small wooden blocks, the same thickness as the future resilient filler. The rail joints are then thermit welded and a tie rod is inserted every 5 ft. 6 in. to keep the rails to gage. The ends of these tie rods are finished with angles to form a T, and these ends are welded to the rail webs. Then the resilient filler is inserted.

The filler is a mixture of asphalt, coke ashes and furnace slag. It is heated to a temperature of 300 deg. C. and when plastic is tamped into place by hand with iron tampers. It is then made smooth on each side by long flat iron bars 5 ft. in length which are pressed against the filler on each side by heavy screw clamps (Figs. 7 and 8). Later, U-shaped clamps with oak wedges are substituted



Figs. 14 and 15—On reservations the upper construction is used in porous soil, the lower section in non-porous soil

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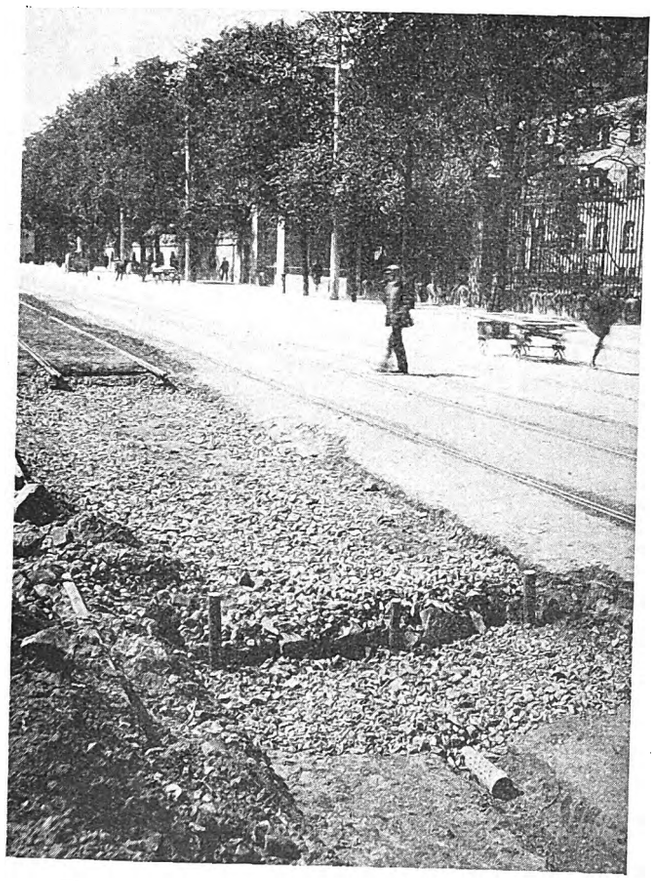

Fig. 16—Track under construction according to the design shown in Fig. 15

for the screw clamps, as shown in Fig. 9. After the bitumen has set the wedges are driven out and the clamps removed. Subsequently the filler is packed around the rail web on each side.

Fig. 10 illustrates a section of track with tie rods in place, ready for the side filler and paving. There is no connection other than the resilient material between the base of the rail and the concrete beam, but the tie rods and paving keep the rail in place.

Before this method of inserting the resilient filler was adopted hot asphalt was poured under the rails, but the present plan has proved more satisfactory.

This form of construction has proved not only very durable but very quiet. Of course, when the rail is renewed the tie rods which are buried in the concrete have to be cut off, and this means that later they have to be replaced. But the filler can be heated up and used over again.

The life of this construction is from 25 to 30 years under a service of about 1,100 single-truck cars a day.

In curves the construction is somewhat different. Here it is customary to use square paving blocks of copper slag, the blocks being brought right up to the side filler. The concrete beam is omitted, but the rails are mounted with tie rods, on a crushed-stone base, as shown in Fig. 11. Fig. 12 shows the finished construction.

In all cases the sub-base is drained. The rail grooves are also drained, being connected at intervals to the sewers.

The track on reservations and other right-of-way is of similar construction to that on curves. A T-rail with a very wide base is used (Fig. 13). It is laid on stone ballast or screened gravel, resting on a base of large stones. Tie rods are used, but no concrete beams. The joints of these rails, like those of the grooved rails, are thermit welded. Fig. 14 shows the usual arrangement on porous soil and Figs. 15 and 16 that on firm soil like clay. After the large vertical stones are set in place at the bottom and covered with a thin layer of gravel, the bed is compacted by a steam roller.

Fig. 17 shows a line laid in this way on a reservation between Nuremberg and Fürth, which are neighboring cities about 4 miles apart. In this 4-mile route there are three tracks and in some parts four tracks. The road thus is able to provide both express and local railway service between the two cities. The express service has only three intermediate stops.

After new track is laid and before it is used, it is customary to grind the rail heads smooth with a grinder car, because it has been found that new rails often show traces of corrugation acquired in the rolling mill. On track laid in the way described, corrugations almost never develop in service.

At one time suburban electric railway track was laid like that on steam railroads with cross ties. The service given by the methods just described, however, has been so satisfactory that it is being substituted for crossties in suburban track which has to be reconstructed.

Fig. 17—High-speed railway on a reservation between Nuremburg and Fürth, 4 miles apart. Part of this line has three tracks and part has four tracks. It gives an express and local service

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Oil-Sealed Housings for Railway Motors

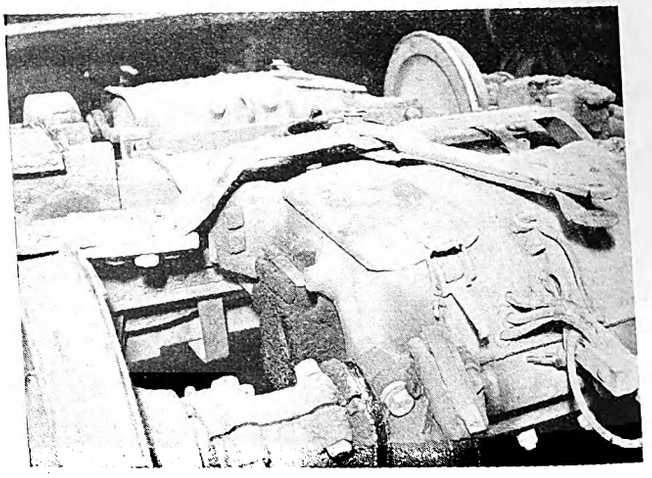
By W. H. Austry
Railway Motor Engineering
Westinghouse Electric & Manufacturing Company

MAINTENANCE of a reasonably constant oil feed for the armature and axle bearings of the railway motor is difficult. To obtain satisfactory bearing life, constant attention must be paid to the oil level, upon which the rate of oil feed depends. In actual service close supervision is lacking, and bearing life is reduced greatly. Oil-sealed housings and axle caps in actual service for four years have demonstrated that an automatically maintained constant oil feed increases bearing life two to three times. This increased life is obtained with a 60 to 90-day lubricating period. In addition this system of lubrication eliminates glazing of waste and provides protection against the entrance of dirt and water. All of these outstanding advantages are secured with a nominal increase in weight and cost.

An accompanying illustration shows an ordinary railway motor and truck as received at the shop for overhaul. The commutator end housing is covered with a deep coating of oil, sand, dirt, and other foreign abrasive material. The cap which should be over the end of the shaft to help exclude dirt from the bearing is missing. In addition, wheel wash enters between the shaft and the bearing, destroying the oil film. The axle cap cover is held partially open by the protruding waste, so that the necessary protection against the entrance of dirt is lacking. The hinged type cover, with its felt lining, must be opened once a week to oil the motors, and the utmost care is necessary to prevent dirt falling in at this time. But most of the dirt enters while the car is on the road, due to covers left partially open with loose or broken springs or missing felt liners. Some dirt is introduced with the oil, since the oiler usually carries his supply in an open pail, using a small can to pour it into the oil chambers.

To limit bearing wear, it is necessary to exclude all abrasive material, and supply an adequate quantity of oil at all times. The amount of oil the bearing receives depends on the kind and quantity of waste used, the grade of oil used and the height of the lift.

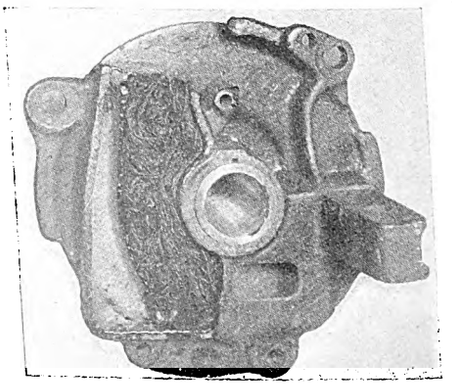
Many experiments and tests have been conducted to determine the most suitable packing material for a waste-packed bearing. Felt, cotton, wool, and many combinations of these materials have been used. Where the waste both lifts the oil and feeds it to the journal, felt and cotton have been found unsatisfactory, since they glaze excessively when the oil supply becomes lean. Wool waste glazes less readily, and is sufficiently springy to maintain excellent contact against the journal. The only really satisfactory packing material is long-strand pure wool waste. The quantity of waste carrying oil is determined by the size of the waste chamber in the housing or axle cap and the manner of packing. All waste packed bearings where the oil is fed to the journal by capillary action should be packed so that a continuous wick is formed from the oil chamber to the journal. The window in the bearing should be filled completely with the waste, which should be packed firmly.



A 40-hp. railway motor as it was received in the shop after one year's operation in city service

The oil used ordinarily is selected easily, since most of the reputable oil companies have special grades of electric car oil, and an adequate engineering staff to deal with customers' troubles which may arise. In the temperate zone, a comparatively light oil is needed in winter and a heavier grade in summer to compensate for the change in the mean temperature.

The relationship between the flow and the lift for medium car oil at 100 deg. C., using a good grade of wool waste, is shown by the accompanying curve. The rate of flow is seen to increase rapidly for lifts of less than ½ in. The feed with a 2½-in. to 3-in. lift is only 20 per cent of the feed with a ½-in. lift. A sectional view of the ordinary housing, packed for service, is shown in an accompanying illustration. With this type of housing it is common practice to fill the oil chamber within ½ in. of the bearing window. The level is ordinarily permitted to drop 1 in. to 1½ in. before the next oiling period. Due to the relatively



Correctly packed pinion end housing for oil and waste lubrication showing wool waste in place

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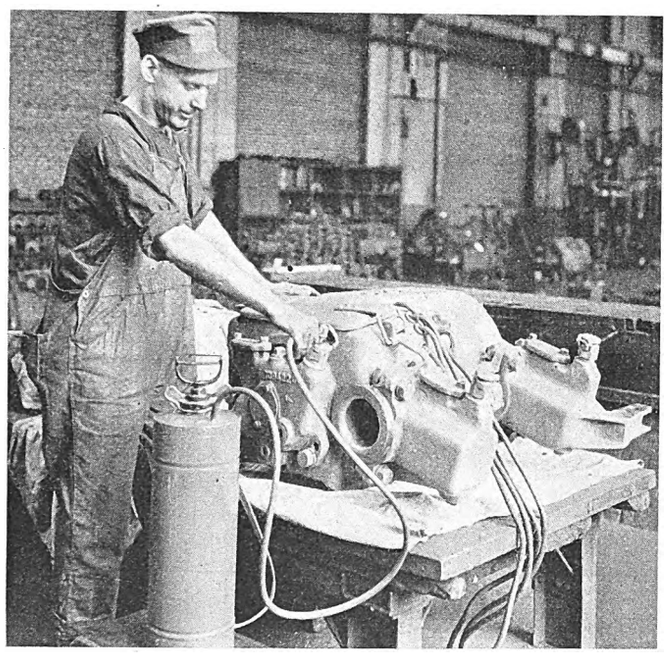
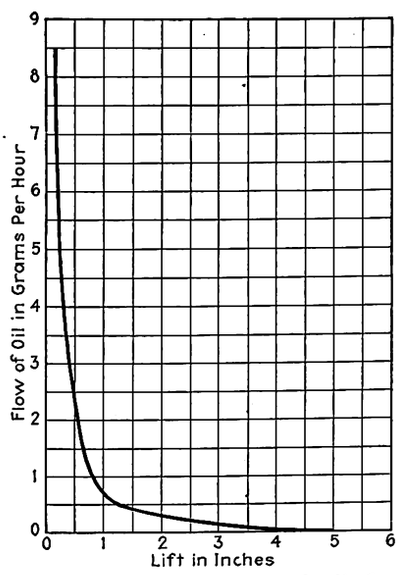


Filling the commutator end housing of a 35-hp. motor fitted with oil sealed housings and axle caps

small oil capacity of this type housing, the oil feed becomes too low for satisfactory operation after approximately 1,000 car-miles. Too long a time between lubricating periods permits the oil feed to decrease still further, increasing bearing wear and often producing hot bearings.

The principle of the oil-sealed lubrication system is best understood by reference to the illustration of the old-fashioned chicken trough and the cross section of an oil-sealed housing. The trough consisted of a Mason jar filled with water and inverted in a shallow pan. The water in the pan was maintained at the level of the lower edge of the jar.

In the chicken trough chamber *B* is the drinking portion, *A* represents the inverted jar, and the ledge *C* the lower edge of the jar, which determines the water level in the outer container. If some of the water is drained from the outer pan *B*, the level will be momentarily lowered below the ledge *C*, and a bubble of air will trickle through into the main reservoir *A*. The main body of the water in *A* drops slightly, which permits the water in the outer pan to rise until a seal is effected at the ledge *C*. If the water is drained continuously from the outer chamber, this bubbling process continues until the water is used completely from reservoir *A*. Referring to the cross-section of the motor housing the outer chamber *B* is the feeding portion, and maintenance of a constant oil level, *C*, keeps constant the waste saturation, and therefore the feed to the journal. Chamber *A* has an extremely large capacity as compared with the ordinary housing. The oil lift is the distance from level *C* to the lower edge of the bearing window. This dimension is fixed by the designer, being based on the actual oil requirements found necessary to secure satisfactory bearing life.



Graph showing decrease of oil flow with lift on 40 hp. motor having oil and waste lubrication

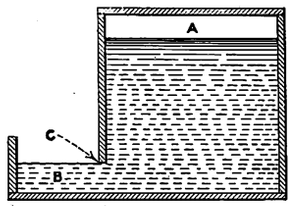
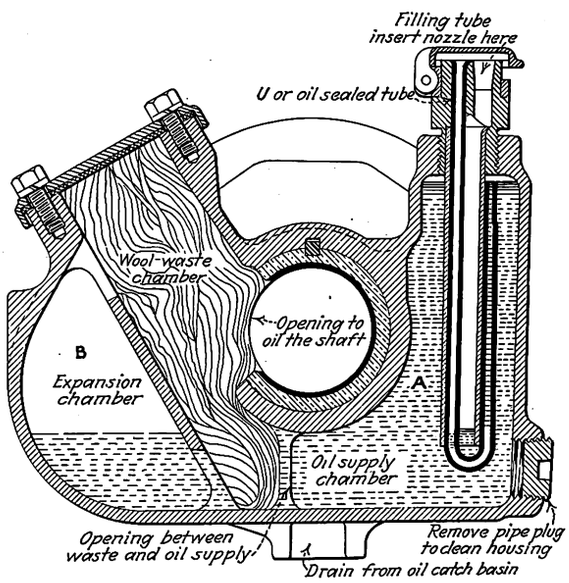


Diagram of principle of old fashioned chicken trough

After properly packing the housing or axle cap, it is filled as illustrated. The tapered nozzle of the pump is inserted in the large hole in the top of the filling tube. The openings in the top of the tube are protected by a hinged cover. The valve in the pump nozzle is opened, and oil is forced into the housing or axle cap. The pressure required is small, and is obtained by previous operation of the hand-operated air pump. One pumping builds up sufficient pressure to fill several housings and axle caps. The hose is sufficiently long to set the pump either on the pit floor or alongside the car. During the filling process, the entrapped air escapes through the U-tube, one end of which opens to the atmosphere in the small hole at the top of the filling tube. The other end of the U-tube opens near the top of the main oil reservoir. When the oil chamber is filled completely, the oil will be forced out through the U-tube, providing a seal by the difference in height of the oil in the two legs of the tube. When refilling, the entrapped air forces out of the U-tube the oil which previously formed the seal. The air then escapes until the reservoir is full and oil again flows out. A steady flow of oil is a positive indication that the reservoir is full. The "plugging" action of the waste is sufficient to prevent the oil rising on that side and escaping through the bearing window while filling. No airtight joint is disturbed in filling.



Cross-section of oil sealed housing

The cover over the waste chamber in nearly all motors is felt-lined and held on by two bolts. A few of the larger motors, due to space restrictions, use the "scissors"

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type cover. The bolted-on cover is removed only when packing the waste, thereby eliminating the entrance of foreign matter which occurs with the ordinary type of cover.

Oil-sealing eliminates the necessity of gaging oil levels. New motors should be lubricated and run for 6,000 miles as a trial period. The motors should then be oiled, keeping a record of the oil consumption of each bearing. Knowing the capacity of the reservoir, the safe oiling period may be ascertained. This period will be from 60 to 90 days, which corresponds with 6,000 to 10,000 car-miles. After this period has been determined, no gaging is required, each housing or axle cap being filled at the specified intervals.

Maintenance Costs Reduced by New Equipment

By W. H. McAloney
Superintendent of Equipment,
Georgia Power Company, Atlanta, Ga.

SINCE 1922 the Georgia Power Company, Atlanta, Ga., has purchased 200 new double-truck, low-floor, four-motor cars for city service, dismantling and scrapping an equal number of two-motor cars, the greater portion of which were single-truck. The new cars are larger and of greater seating capacity. Their use has resulted in an improvement in the service and a saving in platform labor and maintenance cost.

As to advantages gained in maintenance with the smaller motors, numerous parts of small dimensions naturally cost less and are easier to handle. This logically tends to hold down maintenance costs. The only way to show actual results, however, is to give our maintenance costs for the entire division of equipment maintenance accounts, not including depreciation, which are as follows: 1925, $21.53 per 1,000 car-miles; 1926, 19.99 per 1,000 car-miles; 1927, 18.45 per 1,000 car-miles.

Logically, we are getting some advantage from our new equipment, which reflects in our lower maintenance. On the other hand, these new cars and equipment began going into service in 1922, so that the earlier ones have already covered a period of five years.

A stack of 80 of the older type, heavy, split-frame motors which have been retired from service was illustrated in this paper for Dec. 31, 1927, page 1180. The total weight of the motors aggregated 111 tons. These motors were replaced by modern motors, an equal number weighing 56 tons, a reduction in weight of 55 tons, or approximately 50 per cent.

Since 1921 we have retired a total of 426 old motors. During this same period a total of 848 light-weight modern motors have been placed in service, making a net increase of 422 motors. This increase is the result of retiring 159 two-motor cars and 27 four-motor cars, and placing in service 212 four-motor cars.

The total weight of the 426 old motors retired aggregates 516.29 tons as compared to 605.68 tons total weight of 848 motors placed in service, an increase of 83.39 tons.

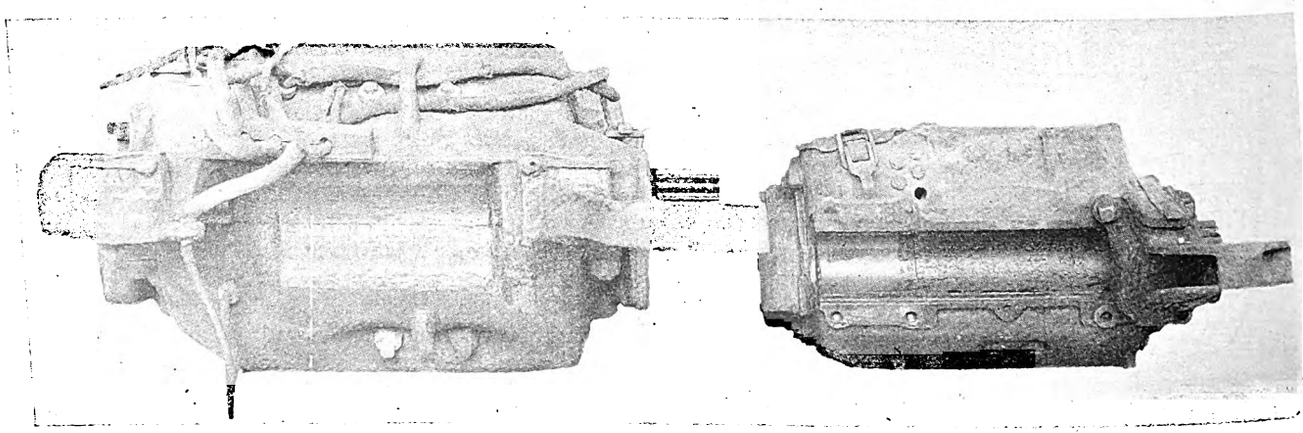
In 1921 we had a total of 1,038 motors, the total weight of which was 1,406 tons. In 1927, with a net increase of 426 motors, the total weight of 1,464 motors amounted to 1,495.35 tons, an increase of 6.36 per cent. Increasing the weight 6.36 per cent is the result of increase in four-motor equipment over two-motor equipment. Replacing an equal number of motors would result in a reduction in weight of 58.4 per cent, since the average weight of 422 motors retired is 2,445 lb. each, as compared to the average weight of 1,429 lb. each for the 848 new motors placed in service.

Some of the advantages from a maintenance standpoint are that replacement of journal boxes, brasses, axles, etc., for a $3\frac{3}{4}$x7-in. journal, costs less than for a $4\frac{1}{4}$x8-in. journal. Replacement of 4-in. axle bearings costs less than for a large axle. The same holds true of all motor parts. This is not taking into account the saving in energy and possibly track maintenance. Our maintenance cost for 1926 was $20, as compared to $18.45 for 1927.

The old motors were rated at 40 hp., 500 volts. They were of the non-ventilated, non-commutating pole, split-frame type. Armature speeds were 500 to 550 r.p.m., gear ratios 16:67 to 18:66, gears 5-in. face, three pitch, spur type, axle bearing finished bore $4\frac{5}{8}$ in. and 5 in. Weights of motors ranged from 2,280 lb. to 2,880 lb.

The new motors are 35 hp., 600-volt, commutating pole type with armature speed 1,100 r.p.m., gear ratio 14:69, gears 4 in. face, four pitch, long and short addendum type, axle bearing 4 in. finished diameter.

In the past five years we have rewound 110 per cent of our old armatures as compared to 0.019 per cent of the new motors. The miles per rewind for the old motors for the year 1927 averaged 307,163 as compared to 10,646,741 miles per rewind for the new motors. This is largely due to newness of the motors, but overhauling, dipping, and baking on a 60,000-mile basis has increased the mileage on the older lot of new motors which have been in service for five years.



The old type motor at the left weighs 2,880 lb., while the new one at the right, a light-weight motor adopted as standard by the Georgia Power Company, weighs 1,415 lb.

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Electric Railway Journal Maintenance Data Sheet

ROLLING STOCK—ELECTRICAL—50

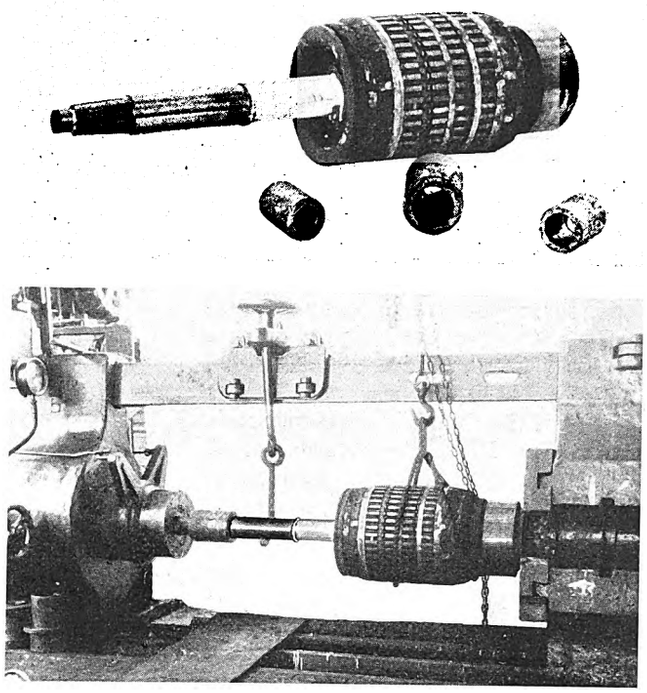
Sleeve Prevents Bending While Installing Shafts*

By C. B. Hall
Chief Clerk Mechanical Department
Virginia Electric & Power Company, Norfolk, Va.

DIFFICULTY was experienced by the Virginia Electric & Power Company, Norfolk, Va., from bending of armature shafts while they were being installed. The practice was to use a wheel press and apply 25 to 30 tons pressure to the pinion end of the shaft while the commutator end of the armature was held against the stationary head of the press. In several instances shafts were bent so as to be beyond repair.

To overcome this trouble a sleeve to fit over the tapered portion of the armature shaft and rest against the end of the bearing surface of the shaft was devised by George S. Cahoon, foreman of the electric shop. This sleeve provides a protection for the shaft end and threads. It transmits the pressure to a larger section of the shaft so that danger of bending is overcome.

One of the accompanying illustrations shows the type of sleeve used together with an armature shaft ready for installation. The other shows the armature in position ready for pressure to be applied.



At top—Sleeves for fitting over the pinion end of armature shafts, with a shaft ready for installation shown in rear
Lower View—Armature in position in wheel press ready for installation of shaft

Submitted in Electric Railway Journal Prize Contest

Electric Railway Journal Maintenance Data Sheet

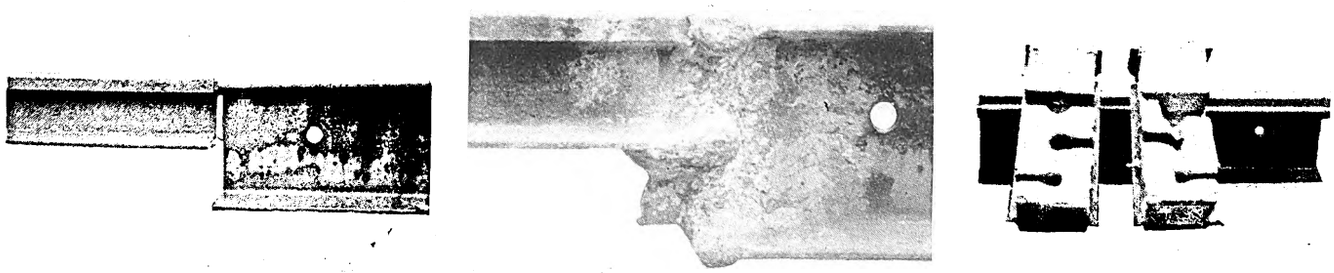
TRACK AND WAY DEPARTMENT—28

Compromise Thermit Joints Made Without Wax*

By J. A. McCartney
Superintendent of Construction Pittsburgh Railways, Pittsburgh, Pa.

RECONSTRUCTION of track on the lines of the Pittsburgh Railways involves a considerable number of compromise joints. With some experimenting it was found that the old method of using wax molds for the thermit joints could be eliminated. A standard pair of mold boxes are cut out to fit the particular joints and with a little additional dressing of the molds it is found that compromise joints can be thermit welded with no more difficulty than the ordinary standard joints. This results in a considerable saving in time and cost. Mold boxes are cut out to fit the most common compromise joints encountered and are now carried as a part of the railway's standard equipment.

In the three accompanying illustrations one shows a set-up for joining 80-lb. A.S.C.E. tee rail with 134-lb. girder groove rail. The view on the right shows a pair of mold boxes cut out and ready for making this joint, and the center view shows the finished weld.



At left—80-lb. A.S.C.E. tee rail set up with 134-lb. girder groove rail. In center—Finished thermit weld.
At right—A pair of mold boxes cut out and ready for applying to the joints

Submitted in Electric Railway Journal Prize Contest

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Electric Railway Journal Maintenance Data Sheet

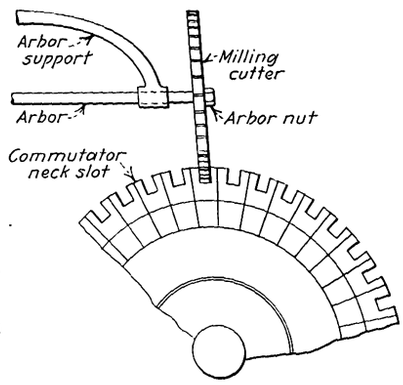
ROLLING STOCK—ELECTRICAL—51

Convenient Commutator Neck Slot Cleaner*

By Arthur E. Clegg
Foreman Electrical Department San Diego Electric Railway, San Diego, Cal.

CLEANING leads and solder from commutator necks of armatures after they are stripped is a long, tedious, tiresome and costly job. To eliminate the costly procedure a milling cutter was designed and is now used by the electrical department of the San Diego Electric Railway, San Diego, Cal. This speeds up the work and leaves the commutator neck slots perfectly clean.

The milling cutter is 1¾ in. in diameter and 0.099 in. thick, and is made of tool steel. The thickness of the milling cutter depends on the width of the slot in the commutator neck. The cutter is fastened to an arbor by a nut taken from a commutator bar slotting machine. It is set for each commutator neck slot and is moved across the slot slowly by means of a lever, which moves the arbor and thereby clips out the leads and solder.



Method of cleaning commutator neck slot by means of a milling cutter

*Submitted in Electric Railway Journal Prize Contest.

Electric Railway Journal Maintenance Data Sheet

TRACK AND WAY DEPARTMENT—29

Rails Used in Concrete Tie Construction*

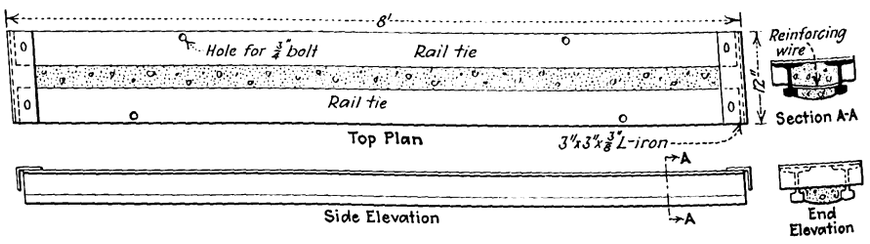
By Louis T. Botto
Superintendent Maintenance of Way, San Antonio Public Service Company, San Antonio, Tex.

IN REBUILDING some gravel ballast tracks a number of reinforced concrete ties made up with old rails were used to replace wood ties in twelve paved street intersections. For this purpose and for use under special work where tracks are not concreted this type of tie has been found desirable as it holds the tracks rigidly in line, gives a greater surface bearing on the subsoil and provides a durability equal to steel and reinforced concrete.

As shown in the accompanying illustration, the tie is made up of two pieces of scrap rail 6 ft. long, spaced 8 in. apart. Angles welded at the ends of the bases of the rails hold them in position. Holes are burned in the bases of the rails, forming the top of the tie, for fastening the rail section used. They are then placed in the track and reinforcing wire is placed so as to hold the concrete firmly in position and then the concrete is poured.

When 50-lb. or 60-lb. rail is used, the ties are made up complete and are placed in the track like ordinary ties. Where heavy rail is used or where long switch ties are necessary, it is easier to pour the concrete after the ties are in place.

On this work it was found that a welder and helper could make 32 frames in eight hours. A cubic yard of concrete, of 1:2:4 mix, fills twenty frames using 60-lb. rail.



Construction of reinforced tie using discarded T-rails

*Submitted in Electric Railway Journal Prize Contest.

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Electric Railway Journal Maintenance Data Sheet

ROLLING STOCK—TRUCKS—26

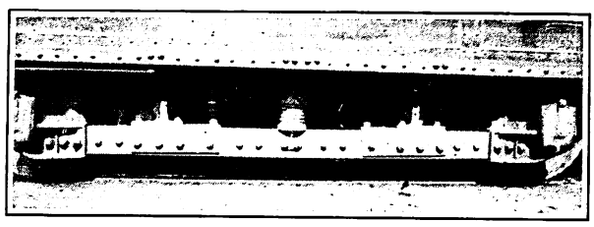
Reinforced Trucks Require Little Maintenance*

By R. T. Chiles

Master Mechanic Cumberland County Power & Light Company, Portland, Me.

THE Cumberland County Power & Light Company has Brill 78-M trucks in service which developed weaknesses. The trouble was overcome by strengthening several parts. The two cross bars of the truck are of 5-in. channels. These were reinforced with ¾-in. x 4-in. plate and the strength of the cross bar gusset plates was increased by making them of ½-in. stock and of increased length. Three-quarter-inch bolts were used instead of ⅝ in. To keep the cross bars tight and eliminate tilting toward the wheels four cross-bar brackets were added. These are of 4-in. x 4-in. x ½-in. angles 8 in. long.

With these improvements the truck has been operating for two years and the bolts stay tight and the trucks keep in alignment. The trucks are also now maintained much cheaper than previously.



Brill type 78 truck with reinforcements

*Submitted in Electric Railway Journal Prize Contest.

Electric Railway Journal Maintenance Data Sheet

ROLLING STOCK—MISCELLANEOUS—34

Compressed Air Vacuum Cleaner*

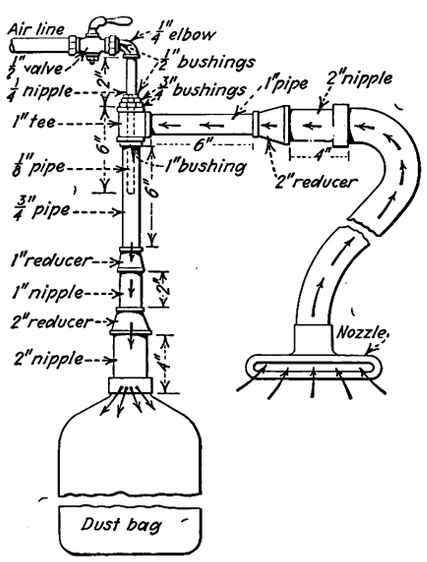
By O. R. McClain

Foreman Air Brake Department Gary Railways, Gary, Ind.

CLEANING of car interiors and seats, ordinarily a disagreeable task, has been made easier through the use of suction equipment developed in the shop of the Gary Railways, Gary, Ind. Before the use of this equipment seat bottoms were taken to some remote section, the car cleaner donned a dust mask, gloves and clothing fastened securely, and the dust was blown off by use of air with 100 lb. pressure. The job was very mussy and seat backs often were not cleaned due to the labor required for removing them. Experiments in cleaning were made with a household type of vacuum cleaner, but this was found insufficient to draw the dust and heavy particles from the upholstery. Four hours of time was also needed to clean the seats in a car with this equipment.

The new device works on the principle of the injector. It was constructed by using ordinary pipe nipples and fittings of appropriate sizes. A partial vacuum is produced through the expansion of 90-lb. compressed air as it leaves a ⅛-in. pipe and enters a ¾-in. pipe. The connection from the vacuum cleaning equipment is made to the ¾-in. pipe outside of the smaller one. The accompanying illustration shows the construction.

The shop air which is used produces a vacuum 60 per cent greater than that of the household vacuum cleaner which was tried. The air pressure supply is controlled by a ½-in. shut-off cock. The vacuum and exhaust openings are of 2-in. pipe nipples turned in a lathe to receive fittings necessary for attachment to a dust bag and to the intake hose of the household vacuum cleaner. Advantages are low cost, absence of wearing parts, light weight and easy operation. Seats do not have to be removed and but two hours are required per car for the cleaning.



Vacuum cleaning apparatus as used by the Gary Railways

*Submitted in Electric Railway Journal Prize Contest.

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Electric Railway Journal Maintenance Data Sheet

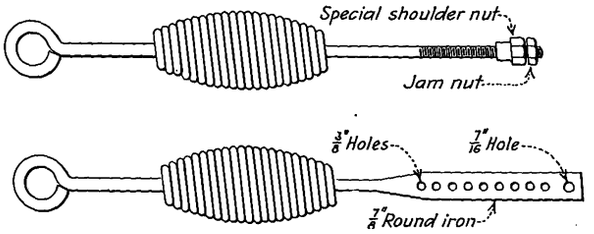
ROLLING STOCK—TRUCKS—27

Improved Adjustment for Brake Release Spring*

By I. F. Morris
Assistant Master Mechanic Southern Ohio Public Service Company, Zanesville, Ohio

CONSIDERABLE trouble was experienced in making adjustments of brake release springs on some Brill 79-E trucks used by the Southern Ohio Public Service Company. The special $\frac{5}{8}$-in. square nut with shoulder on the end of the spring rod would wear almost through the supporting casting on the truck frame, and the spring rods themselves became worn, due to vibration. For adjustment it was necessary to remove the spring from the trucks, cut off the rod and weld a new piece on. This had to be threaded and special nuts fitted to this end.

To overcome the difficulty, the practice now is to weld a piece of $\frac{7}{8}$-in. round steel 15 in. long to the spring rod as close as possible to the first coil of the spring. Beginning 8 in. from the first coil of the spring



Above—Original type of release spring.
Below—Improved construction now used

$\frac{3}{8}$-in. holes are drilled spaced 1 in. apart. At the end of the rod a $\frac{7}{16}$-in. hole is drilled for hooking in a small set of rope blocks to assist in the adjustment. To adjust the spring tension one end of the rope with blocks is hooked to the brake beam while the other is fastened through the $\frac{7}{16}$-in. hole in the end of the rod. When the desired tension is obtained a $\frac{3}{8}$-in. cotterpin is inserted through the nearest $\frac{3}{8}$-in. hole, and a $\frac{7}{8}$-in. washer is placed between the cotterpin and the supporting castings. The edges of the flat washers are cut off slightly to allow both washers to lie flat against the supporting casting. With this arrangement one man can install and adjust a spring, and supporting castings and rods wear very little. The springs also have less vibration and special nuts are unnecessary. A considerable saving in time for application and in ease of adjustment has resulted.

**Submitted in* Electric Railway Journal *Prize Contest.*

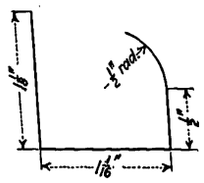
Electric Railway Journal Maintenance Data Sheet

ROLLING STOCK—MISCELLANEOUS—35

Gutters Reduce Window Cleaning*

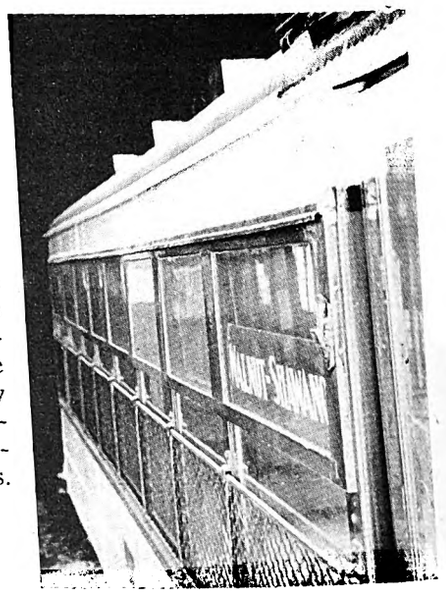
By J. E. Bodoh
Master Mechanic Wisconsin Public Service Corporation, Green Bay, Wis.

CAR WINDOWS streaked with dirt are annoying and repulsive to the street car rider. Rain carries dust and soot from the roof down the sides of the cars where it stays until the car can be returned to the shop for cleaning. To improve the appearance of cars and reduce the amount of cleaning, gutters have been placed over the letterboards of the cars of the Wisconsin Public Service Corporation.



Cross-section of gutter used

To make the gutter retain the water while a car might be swaying in service, a special shape was adopted for the top edge. This is bent over as shown in the accompanying sketch. Gutters were installed on the eave line a few inches above the windows on either side of the car. This construction has been effective, and the cost of $10 per car has undoubtedly been saved several times in car washing, besides increasing the immeasurable value that neatness of a car gives.



Gutter installed on car roof

**Submitted in* Electric Railway Journal *Prize Contest*

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"TOOL STEEL" Pinions pay Big Dividends on Safety Car Motors

A User tells his Experience

"Due to excessive breakage of the pinions we were using, we began, about two years ago, and eventually replaced all of our 108 motors, with 'Tool Steel' pinions which, of course, stopped the breakage. When we had so many pinions break last year, it was not uncommon to have a broken gear or a pair of wheels ruined due to the Operator or Inspector trying to clear up the line and sliding the wheels to a turnout or clear to the barn. You know how much a new gear costs and you probably know that it costs about $30.00 to change a pair of wheels, so I feel satisfied that I'd rather have a 'Tool Steel' pinion."

The above quotation from the letter of a user of "Tool Steel" Pinions further confirms our contention that "Tool Steel" Gears and Pinions reduce maintenance.

The Tool Steel Gear & Pinion Company
CINCINNATI OHIO

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The well-designed and properly constructed oven for baking car motor armatures and coils, effects important savings in maintenance costs, because:

1. Its general layout is fitted to the needs of the plant where it is located.
2. It reduces to a minimum the amount of handling and operating labor required.
3. It conserves fuel by means of properly disposed insulation, heat-proof construction and the recirculation of heated air.
4. It gives a high degree of product uniformity, due to a carefully balanced system of heating and ventilation, that subjects all units of the oven load to the same temperatures.
5. It is highly flexible and under complete control, so that baking conditions can be accurately varied to suit the needs of any type of coils or armatures being run.
6. It can be operated with complete safety, concentration of inflammable or explosive mixtures of gas in dangerous quantities being prevented.
7. It does not allow burning or embrittlement of the insulating varnish.
8. It produces a thoroughly dry film, tough enough to withstand the most severe treatment in service and developing the full dielectric strength of the varnish.
9. It bakes the coils or armatures in the shortest time consistent with characteristics of varnish used.
10. It delivers the baked coils or armatures all ready for assembly.

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lubricants, specially compounded for electric railway car maintenance, are compounded by specialists. TULC is recommended for securing better lubricating results.

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Electric Railway Journal Maintenance Data Sheet

BUSES AND TRUCKS—13

Bus Garage Spring Rack

By J. C. Baine
Engineer of Rolling Stock and Shops Department
New Orleans Public Service, Inc.,
New Orleans, La.

SPRING leaves and assembled bus springs are stored in a rack in the bus garage storeroom of the New Orleans Public Service, Inc. The rack is built of wood and steel strap, and requires but a small amount of floor space. The A shape makes it suitable for racking of spring leaves of different lengths and its lightness makes it easy to move. The two ends and cross braces are constructed of 2x6-in. timber. Openings for the springs are 5 in. square, and the supports are made of 1x¼-in. steel strap. The floor space occupied is 3 ft. 8 in. x 4 ft. 2 in. and the height is 8 ft.

The illustrations on the reverse page show the appearance and dimensions of the rack.

Electric Railway Journal Maintenance Data Sheet

BUSES AND TRUCKS—14

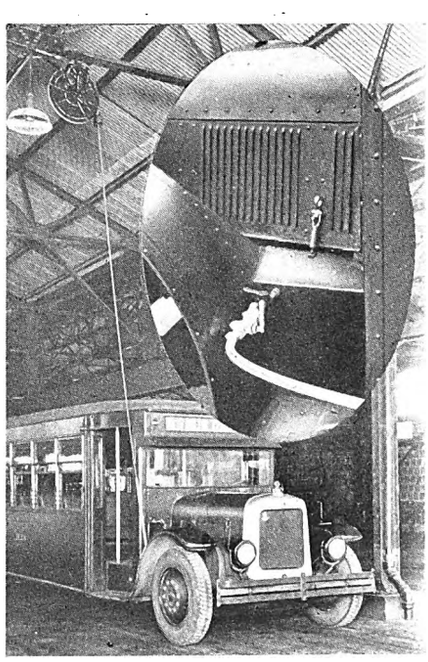
Bus Air Reservoirs Filled from Shop Air

By Gus C. Kraus
Assistant to Superintendent of Rolling Stock and Shops,
New Orleans Public Service, Inc.,
New Orleans, La.

FILLING air reservoirs on buses from the garage reservoirs instead of running the engine to drive the 6-cu.ft. air compressors with which buses are equipped, is the practice of the New Orleans Public Service, Inc. Connection is made from the garage air supply tank to air hose suspended on a spring return hose reel attached to the lower chord of one of the roof trusses. An additional 15-ft. length of hose was added to that supplied with the reel. A rubber ball attached to the hose acts as a stop to limit the return travel on the reel.

The free end of the hose is fitted with a standard Westinghouse Air Brake Company's air cock and a Chicago Pneumatic Tool Company's two-prong air hose connection mates with a similar one located on the bus. About 3 ft. of the free end of the hose is painted white to attract attention.

Four of these reels are installed in the garage building and each will serve approximately nine buses. A fifth reel is installed alongside the gasoline pump house. A considerable saving in gasoline has resulted from charging bus air reservoirs from the garage reservoir instead of running the gasoline engine on the bus. The greatest saving results when air brakes and air-operated doors are inspected, adjusted and tested. If a bus stands for any considerable time near the gasoline pump house, the reel method is used for building up the air supply, and this method is used just before buses leave.



Spring return hose reel attached to roof truss with length of hose sufficient to reach several buses. Insert shows hose connection at bus

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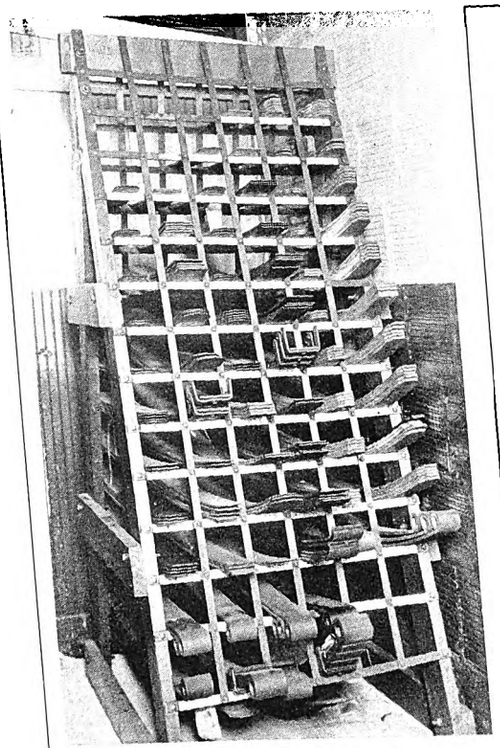
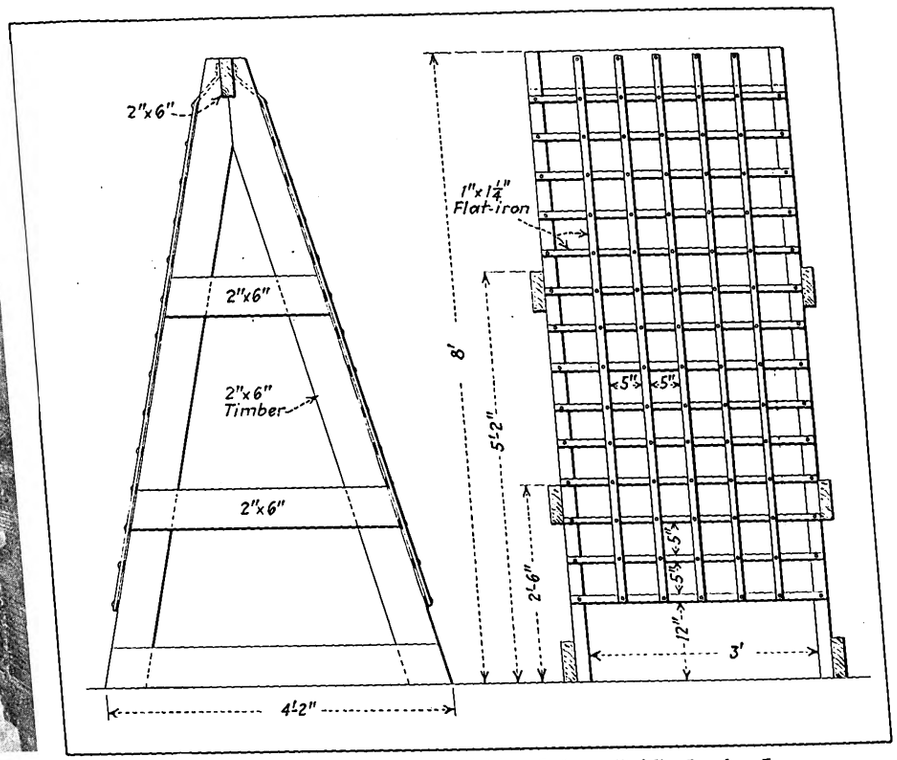
Electric Railway Journal Maintenance Data Sheet

BUSES AND TRUCKS—13A





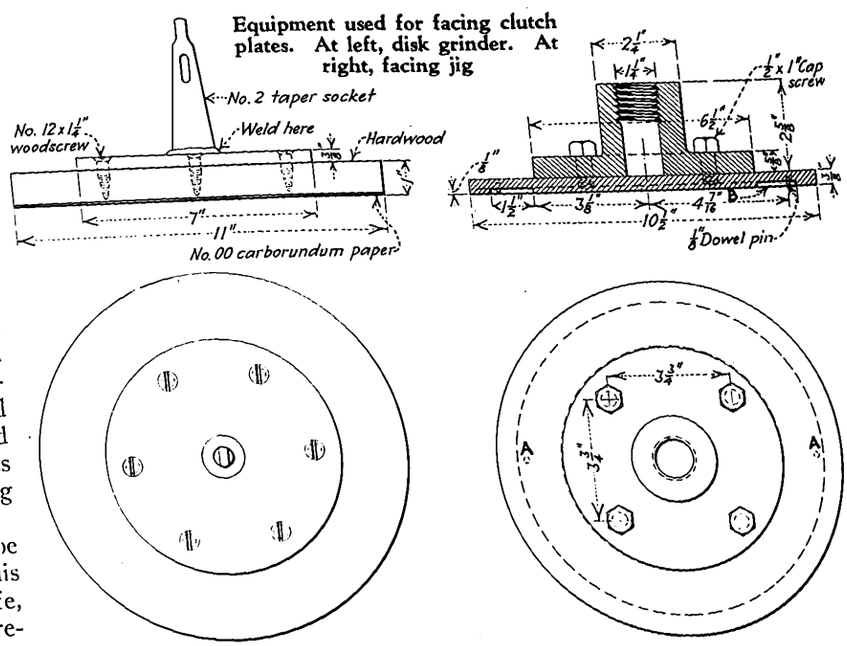
Convenient storage for bus springs is provided by this rack in the bus garage of New Orleans Public Service, Inc. At right—Detail of construction

Electric Railway Journal Maintenance Data Sheet

BUSES AND TRUCKS—15

Clutch Plate Facing Jig*

By Charles Herms
General Foreman San Diego Electric Railway, San Diego, Cal.



Equipment used for facing clutch plates. At left, disk grinder. At right, facing jig

CLUTCH PLATES of buses of the San Diego Electric Railway, San Diego, Cal., are trued up with the aid of a clutch plate truing jig. It was found that composition plates became badly worn when in service from 15,000 to 20,000 miles. The wear is only on parts in contact with the metal clutch plate and consequently abrupt shoulders are formed on the composition plate at the end of the steel plate. Starting becomes jerky due to the steel plates catching on these shoulders.

Ordinarily the plates would be scrapped when they reached this stage, but in order to increase the life, a disk grinder was designed for refacing a set of plates. The accompanying illustration shows the jig which holds the clutch plate which is pressed into slot *B*, and arranged so as to engage the two dowel pins of the lathe. marked *A*. The jig itself is mounted on the lathe chuck spindle. The disk grinder is mounted on the tailstock so grinder is mounted on the tailstock of the lathe. paper is used by gluing it to the face of the disk grinder. One piece of paper will face several hundred No. 00 carborundum plates absolutely true.

**Submitted in* Electric Railway Journal *Prize Contest.*

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May Maintenance Prize

Won by

R. J. Fennell

CROSS bonds are kept tight on the lines of the Toronto Transportation Commission where these are installed in concrete by making provision for movement. This is a very serious problem which electric railways have with this type of construction. A length of hose is slipped over the end of each bond before the terminal is welded to the rail. When this is imbedded in the concrete, the bond has a free movement for the length of the hose. With this method, if a rail becomes loose in the concrete bed any movement is taken up in the free length within the hose and the bond does not break at the terminal. The judges in ELECTRIC RAILWAY JOURNAL'S Maintenance Contest awarded the $25 monthly prize for May to R. J. Fennell of the Toronto Transportation Commission, who originated this method of installation and submitted a description of it.

Honorable mention was awarded to R. T. Chiles, master mechanic Cumberland County Power & Light Company, Portland, Me., for his description of the general utility line truck used by the company. By rigging up a derrick on a truck much of the maintenance and construction work has been done better, more quickly and with a saving in labor.

The Maintenance Data Sheet section published in this issue includes another group of articles submitted in ELECTRIC RAILWAY JOURNAL'S competition. These, together with others published in the May 26, June 2 and June 9 issues, will be judged for the monthly prize of $25 to be awarded for June.

The amount of material which has been received in the contest is of considerable volume and each mail is bringing in additional items, so that many interesting descriptions of methods and devices will be published in future issues. These should serve as a guide to contributors as to the kind of material that is being submitted in the contest and also assist maintenance men toward perfecting practices which will prove of great value. Contestants should read the rules carefully and, as the contest is scheduled to close on July 31, all are urged to submit their material at once.

Send in Your Maintenance Items at Once

MAINTENANCE men have six weeks more to submit items in ELECTRIC RAILWAY JOURNAL'S Maintenance Contest. There are many men in the industry with knowledge of improved methods and devices for making repairs that stand a good chance to win one of the prizes and at the same time assist other maintenance men in improving their work.

The following are the revised conditions for submitting material in the contest:

1. Any employee of an electric railway or bus subsidiary may compete.
2. The author does not need to be the originator of the idea.
3. Articles may be submitted by several persons or by a department.
4. Any maintenance practice or device for electric railway or bus repairs may be submitted.
5. Articles should be 100 to 200 words long, with one illustration, and in no event longer than 400 words with two illustrations.
6. Illustration material may be in the form of drawings, sketches, blueprints or photographs. All sheets should be marked "Maintenance Competition."
7. Manuscripts should be mailed to the Editor of ELECTRIC RAILWAY JOURNAL, Tenth Avenue at 36th Street, New York, N. Y.
8. A prize of $25 will be awarded each month for the best maintenance idea in the group published during that month. A minimum of $5 will be paid for each article accepted for publication. Manuscripts will be received until July 31, 1928.
9. Announcement of the winner each month will be made in the issue devoted to maintenance and construction (the third issue each month) following the month in which the article was published.
10. Additional details were given in ELECTRIC RAILWAY JOURNAL for April 16, 1927, pages 700-701.

R. J. Fennell

who was awarded the May prize in ELECTRIC RAILWAY JOURNAL'S Maintenance Contest, is assistant road master for the way department of the Toronto Transportation Commission, Toronto, Canada. His employment by the commission began in 1921, when he organized the welding and grinding section and continued as superintendent until 1927, when he was promoted to be assistant road master.

Mr. Fennell is keenly interested in electric welding and all its uses throughout the electric railway industry. His varied experience was gained during eight years with the Canadian Allis-Chalmers, Ltd., Montreal, where he started as a machinist and advanced through the position of shop foreman, to become superintendent in charge of field erection of hydraulic turbines. Moving to Toronto in 1916 he spent two years in munition manufacturing as superintendent of the Consolidated Steel Company. For two years prior to his joining the Toronto Transportation Commission he was mechanical superintendent with Baldwin's Canadian Steel Corporation, Ltd. Under Mr. Fennell's supervision and direction the electric welding practice of the Toronto Transportation Commission has become standardized on a very high plane and improvements in methods are being made.

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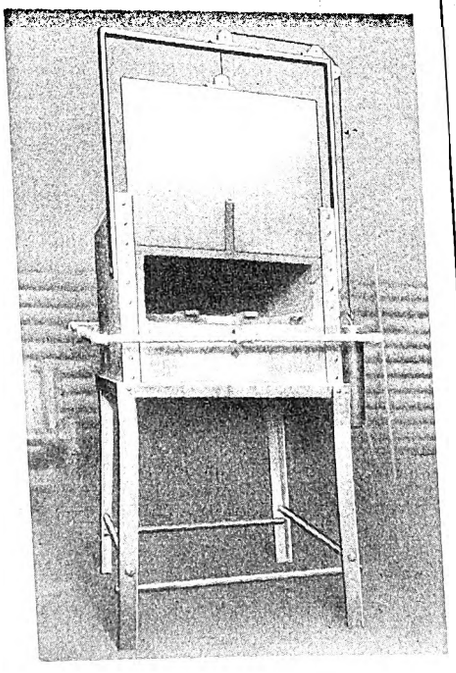
High-Temperature Gas Furnace

MUCH importance is attached by General Foreman George Johnson of the Binghamton Railway, Binghamton, N. Y., to a high-temperature furnace he has designed and built in his shop. It is considered as essential as the machine tools and other equipment. This furnace has been found very useful, and without it a great many jobs could not have been completed. The design is very simple, yet very effective. It is made in two parts, viz., a stand and the furnace. The stand is made of 2-in. angles bolted together and is 28 in. square. The legs are tied together by $\frac{3}{4}$-in. bolts. The furnace is 28 in. square and is made of 2-in. angles and $\frac{1}{8}$-in. sheet steel. The walls of the furnace are lined with fire brick. Front, side, back and bottom walls are 3 in. thick and the top 6 in. thick, thus making the furnace approximately 20 in. long by 11 in. high by 20 in. wide. The front of the furnace is closed with a sheet-steel door 19 in. high by 22 in. wide by $\frac{1}{8}$ in. thick. This door slides vertically and is held in the open position by a counterweight attached to a $\frac{1}{8}$-in. cable running over 1-in. pulleys. A $1\frac{1}{2}$-in. gas pipe encircles the furnace entirely and four taps are taken off at the center of each side which extend within it. Each of these taps is connected to a $\frac{1}{2}$-in. Bunsen burner. Gas is obtained from the city supply. A $3\frac{1}{2}$-in. pipe installed through the top of the furnace provides air.



Shop constructed gas furnace

Dick Prescott Inspects the Shop

And Plans a Trip

SEVERAL days after Dick Prescott, superintendent of equipment of the Consolidated Railway & Light Company, had appointed Steve White his assistant, he suggested that they take a turn through the shop together to look over the several departments. Dick had made this a regular practice ever since his appointment as engineer of equipment, long before he had even dared to think of being in full charge of the department. He had found the custom of taking a regular trip through the shop profitable from many angles. It helped him to get better acquainted with the foremen and with the men. Each department liked to feel that its work was of sufficient interest to attract his attention regularly. He found that many routine shop problems that the foremen would hesitate to bring to his office came to his attention in this way.

Shortages of material, minor friction between departments, questions of personnel or disclipine, the need for new machines or better facilities —in fact, innumerable things, each small in itself but looming large in their aggregate effect upon shop efficiency and costs, came to light in these regular trips through the shop.

As the two men entered the carpenter shop where they had first met, Dick as a new apprentice and Steve as foreman of the department, both were struck with the changes that had taken place within a few short years.

"This doesn't look much like the shop you came to work in a few years ago, Dick," ventured Steve.

"No, there have been a lot of changes," replied Dick.

"I was just checking up the other day and find that there are about half the number of men in the shop that there were three years ago, although we're putting cars through for overhaul about a third faster than we did then."

"We're doing a more thorough job at that, Steve."

"There's no question on that score, Dick. Our cost per car has dropped, but our pull-ins are lower than they have ever been."

"We still have three groups of cars, though, that are costing us a lot of money to operate and maintain. There has been some discussion whether we ought to undertake to rebuild them for one-man operation like those we put through last year, but I don't think it would be a wise expenditure."

"I don't either, Dick. There is little question but that these last three lines should be operated with one man; it would reduce costs and improve service to the public. But it would cost over $4,000 each to put those old battleships into proper condition, and after we got all through they would still be an eyesore on the streets, heavy and expensive to operate."

"Nevertheless, Steve, something should be done promptly about them. Its costing more money than we can afford to keep them going as they are."

"I've been watching with interest the articles on some of the new cars that are being developed, and hoping that our management would soon see the wisdom of buying some modern equipment."

"That's one of the improvements that I think we can look forward to in the near future. In addition, there are many other things that are being discussed in the industry, to which we could profitably give attention. I have been thinking for some time, that you and I ought to be getting out more than we are to see what other properties are doing."

"I believe you're right, Dick. I've been reading about a lot of practices that I would like to look over at first hand."

"Good. Suppose you make up a list of the properties you think we ought to cover, and I shall take it up with Mr. Milburn after the staff meeting tomorrow."

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Association Activities

Largest Canadian Convention Held

Meeting at Toronto exceeds in attendance and in number and size of exhibits any ever held by the Canadian Electric Railway Association

SOME 725 delegates and guests gathered at the Royal Coliseum in the National Exhibition at Toronto last week for the 24th annual meeting of the Canadian Electric Railway Association. This was far and away the largest convention of the association ever held. The exhibits were the most comprehensive, covering a wide range of products. Varied entertainment features gave the delegates time for relaxation from the serious business of the meetings.

The technical sessions were held on the mornings of June 6 to 8. Each day a luncheon was served immediately after the session, at which an address was made by some man prominent in the industry or in the life of the Canadian nation. The afternoons were reserved for inspection of the exhibits. For entertainment a supper dance was held on Wednesday evening, and on Thursday a cabaret dinner, followed by a dance, was given.

A special entertainment feature was a concert given each afternoon by the Toronto Concert Band, an organization consisting of some 50 pieces, all recruited from the Toronto Transportation Commission.

Inspection trips were conducted to the various operating units of the T.T.C., and special sightseeing parties were arranged for the ladies.

The registration up to and including Friday was 395 operating men, 207 manufacturer representatives and 123 guests, including ladies, a total of 725.

In his opening address at the Wednesday session President H. E. Weyman stressed the need for a modern viewpoint and for the throwing off of the shackles of precedent. An abstract of his address appears elsewhere.

Reports were presented by the committees on motor buses and trucks, safety and accident prevention, rail corrugation, and publicity and merchandising of transportation.

Progress of the Motor Bus

The report of the motor bus and truck committee was presented in abstract by the chairman, C. H. Dahl. The development of and progress made by the motor bus in the past ten years according to the committee, have been so marked that it can now safely be asserted that there no longer is any doubt as to the fact that the motor bus fills a distinct need in transportation. Losses in motor bus operation quite frequently are not the fault of buses, although buses are blamed for them. It is no doubt that a profit-and-loss statement of a good many of the motor bus routes operated today would show losses. An analysis of the circumstances under which bus routes were inaugurated would readily explain the reason for many such losses. One reason for losses being shown is that buses were put in service on routes where the number of people to be carried was so limited that the route could not possibly pay, and yet buses were installed to save a larger investment for car service. The loss was not the fault of the motor bus.

Closely allied with the foregoing, says the committee, are those cases in which the company has permitted itself to be prevailed upon to provide service where a simple analysis of the traffic to be served would have indicated that it was not sufficient to warrant the operation of a motor bus route. The matter of installing an extra bus route may not involve any relatively large outlay of money, so that an unprofitable line will be instituted. Subsequent statistical analyses of bus operations may blame the bus for operating at a loss, but the fact that a loss occurs under such circumstances is not legitimately the fault of the motor bus.

The committee states that the motor bus operations, as regards fares, should have distinct treatment from electric railway operations. At the present stage of motor bus development it costs approximately twice as much per space unit to operate a transportation mile by bus as it does by street car. Under these circumstances it is folly to hope that the motor bus can be operated at the same fare as the street car. In this connection the trend toward higher bus fares in the United States is cited.

As to the proper economic size of the bus, the committee states that this cannot be determined definitely. While the 29-passenger size seems to be most popular for de luxe and street car service, both the smaller and the larger types have attracted considerable attention. Where the traffic is not too heavy it is believed that 21-passenger buses with fair frequency will give better results than larger units with long waits between. On streets with heavy traffic in large cities the 40-seat bus of types recently developed would appear to have an economic place.

On the subject of taxation the committee states that while the industry should bear its proper share of the burden of maintaining highways, excessive taxation by various government bodies may discriminate against this method of transportation to such an extent as very seriously to curtail the scope of its operations. Timely action by interested associations may be a considerable factor in securing fair treatment in this regard.

In the discussion which followed, J. L. Smith, superintendent motor coach department Toronto Transportation Commission, stated that for the larger properties he favors 29-passenger buses to those of smaller seating capacity, even though the seats are not always filled. This is because of the greater flexibility in giving varied service. For instance, the regular city buses can be used in an emergency to assist on sightseeing routes, tours, and occasional trips. A use of buses which was not mentioned in the report, he said, is to bridge gaps in the street car service temporarily, as when a track is torn up for repairs.

D. E. Blair, general superintendent Montreal Tramways, stated that under the conditions prevailing in Montreal express service with street cars is not possible. He believes that it is possible to use for this purpose buses leaving the congested district during the rush hours, and that an important service of this kind can be built up.

W. J. Woolley, traffic superintendent auto bus division, Rio de Janeiro Tramway, Light & Power Company, Rio de Janeiro, Brazil, said that in Rio some 150 buses are in use in city service. On most of the routes the equivalent of a 10-cent fare is charged, with no transfers. The policy there is to make the tramways feed the buses rather than the reverse, as is customary in this country, because the business streets are so narrow and so congested that the buses make better time.

Eustace Smith, Jr., secretary of the association, stated that the association is trying to have legislation adopted eliminating the 10 per cent import duty on bus bodies. Removal of this tax should stimulate the use of the most recent types of buses in Canada.

Rail Corrugation

The report of the committee on rail corrugation was presented by C. R. Kinnear, chairman. It was a well-presented résumé of the work done on this subject by the Canadian association, as well as a review of the investigations of the A.E.R.E.A. and the International Association committees on the same subject. An abstract of this report will appear in a future issue of this paper.

R. M. Reade, superintendent Quebec Railway, Light & Power Company, presented the report of the committee on safety and accident prevention. Accord-

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ing to him it is necessary to develop a safety consciousness, if accidents are to be prevented automatically.

A spirited discussion ensued. W. R. Robertson, general superintendent Hydro-Electric Railways, Toronto, held that local conditions will govern to a considerable extent what shrould be done to promote safety. Most of the accidents are due to automobiles.

J. F. H. Wyse, general manager Ontario Safety League, spoke of the "Just Kids" Safety Club which has been organized in Toronto by one of the daily newspapers. This has been a very constructive force in teaching safety in the schools and protecting a class of persons particularly subject to street accidents.

Through streets on entering which vehicles must come to a full stop, have done much to promote safety on the highways, and particularly to prevent collisions with street cars, according to Leonard Tait, manager London Street Railway. In this statement he was corroborated by Mr. Wyse.

Mercury Rectifiers

A paper giving operating results after a year's experience in conversion of alternating current to direct with mercury and rectifiers was read by M. L. de Angelis, assistant electrical engineer Montreal Tramways. An abstract of Mr. de Angelis' paper will appear in a future issue of this paper. He told how the operation of the station has been perfected, and indicated that the results at present are highly satisfactory.

C. A. Butcher, substation engineer, Westinghouse Electric & Manufacturing Company, compared the rectifier with the synchronous converter. He does not think the margin of efficiency between the rectifier and the 60-cycle converter at 600 volts is sufficient to justify the extra cost entailed by the former. For higher direct-current potentials he believes there is a legitimate field for the rectifier.

The discussion on this subject was continued at the Friday session, W. R. Robertson offering figures comparing the Montreal substation with a recent synchronous converter substation at Windsor.

K. B. Thornton, assistant general manager Montreal Tramways, offered some figures in comparison of the two conversion systems. These indicate that the rectifier has considerable advantage from the standpoints of weight and performance.

J. S. Arbuckle, electrical engineer American Brown Boveri Electric Corporation, gave an extended discussion of the relative merits of rectifier and converter, and pointed out that while few installations of rectifiers have been made in this country it is in general use on European rail systems.

Traffic Improvements

"Making Street Railways Serve" was the title of a paper presented by E. J. McIlraith, staff engineer Chicago Surface Lines. There has been too much haphazard development of traffic control, he said. Street railway men must think in terms of general traffic control rather than in the movement of street cars. Helping to keep the automobiles moving will help public transportation as well as create a better public feeling. Parking should be curtailed where it will interfere with the free movement of vehicles. In Chicago, for instance, the elimination of parking has greatly facilitated movement and increased the street capacity, particularly during the rush hours.

The importance of a system of street signals was stressed by Mr. McIlraith. Most of the signals installed in the United States are improper, he said, but signals that are appropriate and are properly installed will speed up traffic.

While the majority of railways must continue to use some of their old cars, Mr. McIlraith holds that it is possible to improve them. In particular the old slow-acting brake, which requires two seconds to take hold fully, should be replaced by one with quick-acting devices where full action is obtained in not more than one-half second. The motors usually are powerful enough to permit a reasonable acceleration, although it is better to install motors that will permit of as high rates of acceleration as are practicable.

Fast schedules are necessary to meet competition, and rapid acceleration are essentials. It is possible to make a practical schedule as high as 12 m.p.h., which is approximately the same as the speed of private automobiles, which will not average higher than 15 m.p.h. including stops and slowdowns. Training of the personnel is necessary to obtain results such as these.

Mr. McIlraith's paper will appear in abstract in a later issue.

A. E. K. Bunnell, consulting engineer, Toronto, commented on the fact that Mr. McIlraith has approached his talk from the point of view of the car rider rather than that of the operator. He felt that this is the way to determine what improvements are needed. Not all the public desire to use the cars all the time, he believes. The car rider wants (1) clean equipment; (2) a smooth track, and (3) well-kept schedules. The riders more and more want speed and a preferred type of service. They want safe service and reliable service, but he questions if they all care whether the service is economical or not. Unless a preferred service is given at a higher rate he feels that the transportation system is not meeting its responsibilities.

H. B. Potter, general manager United Railways & Electric Company, Baltimore, believes that the street railways are the most important element in handling the traffic in cities. The railway men should work closely with the public officials, particularly the police. They should take a prominent part in the organization of safety councils.

A paper on general overhead line practice was prepared by M. C. O'Donnell, electrical engineer Ottawa Electric Railway. The organization of the line department in Ottawa was outlined. The system is divided into two districts, one in the city and the other including the suburban lines. A system of keeping records of trolley wire breaks was described. It was noted that approximately twice as many breaks occur in winter as in summer.

Trolley Wire Maintenance

Discussing the paper, J. F. Neild, electrical engineer Toronto Transportation Commission, pointed out that real maintenance required that the trolley wire be renewed before an interruption to service occurs. To do this it is necessary to keep a close record of the wearing parts. The life of material for each intersection is recorded and checked carefully. It has been found possible to get up to as high as 275,000 wheel passes for each trolley ear. To do this the trolley is carefully centered with a plumb line and a track gage, and 7½ to 8 per cent of trolley wire is renewed each year.

Many trolley breaks are beyond the control of the department, but by an analysis of the causes of breaks it has been found possible to reduce the total number materially. For instance, in Toronto there were 421 breaks, while in 1927 there were only 21 breaks, of which 10 were beyond the control of the department.

J. Metcalf, assistant traffic superintendent Toronto Transportation Commission, stated that there had been a notable improvement in car service due to the improved condition of the trolley wire.

Mr. Neild's department has adopted a standard wear of 45 per cent of the area before discarding wire. He believes that if grease can be placed on the top of the trolley wire there is an advantage in keeping preventing the formation of sleet. The trolley wire is strung in cold weather to get maximum tension and minimum sag.

Electric Track Switches

A paper on the maintenance of electric track switches was presented by L. H. McAdam, general inspector electric switches, Toronto Transportation Commission. An abstract of this will appear in a future issue. Discussing this paper E. S. Olmstead, vice-president Cheatham Electric Switching Device Company, stated that there is a saving of approximately twenty seconds per switch movement by the use of electric switches. For anything closer than a ten-minute headway or for one-man cars he believes that electric switches are absolutely necessary. If a sufficient number of cars are in service so that one or more can be eliminated due to the time saving, the monetary value is considerable. If it is not possible to save a car the headway may be reduced to improve the service.

The New Officers

Officers were elected for the ensuing year as follows:

Honorary president: Julian C. Smith, president Montreal Tramways.

Honorary vice-president: Acton Burrows, president Acton Burrows, Ltd.,

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and proprietor *Canadian Railway and Marine World.*

Honorary advisory council: Hon. Thomas Ahearn, president Ottawa Electric Railway; Lt. Col. J. E. Hutcheson, vice-president and general manager Montreal Tramways; George Kidd, president British Columbia Electric Railway; Charles A. Magrath, chairman Hydro-electric Power Commission of Ontario; W. E. Phin, president Dominion Power & Transmission Company; A. E. Warren, vice-president Canadian National Electric Railways.

President: D. W. Harvey, general manager Toronto Transportation Commission.

Vice-president: C. H. Dahl, assistant general manager Winnipeg Electric Company.

Treasurer: H. C. Patten, comptroller Toronto Transportation Commission.

Auditor: J. E. Richards, manager and treasurer London & Port Stanley Railway.

Executive committee: The president, the vice-president, the treasurer, the immediate past-president (H. E. Weyman, Levis), and D. E. Blair, Montreal; T. W. Brackenreid, Port Arthur; F. D. Burpee, Ottawa; A. H. Foster, Brantford; W. S. Hart, Three Rivers; D. W. Houston, Regina; W. R. Robertson, Toronto; Leonard Tait, London; K. B. Thornton, Montreal; G. E. Waller, Hamilton.

At a meeting of the new executive committee Eustace Smith, Jr., of the Toronto Transportation Commission, was reappointed secretary of the association.

Luncheon Talks on Vital Subjects

A feature of the convention was the series of talks at the luncheons held each noon immediately after the business session. At Tuesday's luncheon Mayor Samuel McBride of Toronto welcomed the delegates, pointing out the progress that has been made in transportation in the city. He was followed by Chairman P. W. Ellis of the Toronto Transportation Commission, who sketched the growth of the system. The city now has invested in this enterprise more than $50,000,000. It serves an area exceeding 35 square miles. At an average fare of 6.17 cents per passenger all costs have been met, including provision for depreciation, redemption of debenture debt and for contingencies. Besides these costs an annual surplus ranging from $60,000 to $110,000 has been accumulated.

The principal address was made by Lucius S. Storrs, managing director of the American Electric Railway Association, who stressed the point that the street railway is the front door of the city, and that it should be made as attractive as possible. He also pointed out the great safety of electric railway travel. Only one possenger in every 155,000,000 carried by street cars is fatally injured.

At Thursday's luncheon the speaker was W. H. Moore, chairman of the advisory board on tariff and taxation, Dominion of Canada. He showed the urbanization of the nation in the last 30 or 40 years. Both in that country and in the United States the proportion of people living in the cities has grown tremendously, until now approximately half the total population reside in them. This development, he holds, is due in large measure to the influence of short-haul transportation, principally the street railway. This urbanization has thrown new responsibilities on the street railways that have created it.

On Friday the luncheon speaker was Hon. George S. Henry, acting premier and minister of public works and highways, Province of Ontario. The civilization of a people, he holds, is measured by their transportation. The steam roads have not filled all the needs, so that the street railways and buses have been essential. As to the buses, out of some 500 in Canada about one-third are operated by the electric railways. There will always be a field for the railroad, the interurban electric railway and the city railway, he feels. He deplores destructive competition. Since the public will take any form of transportation it wants to use, the existing operators must be protected by governmental agencies as a matter of fairness and for the benefit of the public in the long run.

On the subject of taxation, Mr. Henry pointed out that the bus operator in Ontario now must pay the ordinary taxes, a gas tax of 3 cents per gallon and a tax of 0.1 cent per passenger seat-mile traveled on the provincial highways. Besides this it is compulsory to carry public liability insurance.

Large Exhibit a Feature

In connection with the convention the manufacturers' section of the association had the largest exhibit of the kind ever presented in Canada. Under the leadership of C. H. Clancy, chairman of the exhibit committee, 39 exhibitors displayed a wide range of electric railway and bus equipment.

At the close of the convention the manufacturers' section held a meeting, at which votes of thanks and suitable gifts were extended to Mr. Clancy, Eustace Smith, Jr., secretary of the association, and J. F. Neild, chairman of the entertainment committee, for the work they had done in making the convention a success.

A vote of thanks also was extended to the Toronto Transportation Commission for the fine service and attention given by that organization.

Don M. Campbell was elected honorary chairman of the manufacturers' section; O. C. Rehfuss, chairman; H. T. Gibbs secretary-treasurer, and W. G. Gordon and S. E. M. Henderson additional members of the executive committee of the section.

Better Transportation Can Be Sold*

By H. E. Weyman
Manager Levis Tramway, Levis, Quebec

WE ALL recognize that our industry has been and still is, perhaps, passing through a period of transition. A new transportation tool, the motor bus, made its appearance a few years ago and at first entered the transportation field as a competitor. The bus was placed in the hands of irresponsible persons, permitted to run wild without regulation, and provided with a roadbed and other facilities practically free of cost, while the electric railway is required to pay for the cost of not only its roadbed, but the pavement for its competitors to use free of cost. It is taxed right and left, and required to clear the streets of snow to allow circulation of all vehicles.

I think we all realized from the first that if the bus had to provide its own roadbed and other facilities on an equal basis with the electric car and submit to regulation as eventually it must, it could not exist and compete. Unfortunately this was not recognized by those in authority and the public at large. The natural result has been that the credit and financial status of the electric railways was somewhat undermined. In consequence we have been passing through a hard and critical period, but one which I think we have now passed successfully and with great credit.

Public and civic authorities have not yet realized that our industry is the most severely regulated one in the world. Competition is said to be the life of a nation, but to permit competition with a strictly regulated industry is hitting a man whose hands are tied. It is obvious that we must all endeavor to correct this weakness and take every means to inform the public and authorities of the facts and conditions under which we operate. I believe we will then obtain public co-operation instead of opposition.

Bus and Car Can Serve Together

Time and experience have made it evident that the bus is not going to replace the electric car except under certain conditions, such as where the railway should never have been built. The public is beginning to realize this and it remains for the public authorities to recognize that the established transportation organization is the logical party to use this new tool, and that it can be co-ordinated with the electric railways to the mutual advantage of themselves and the public. It is for us to recognize that this new vehicle will broaden out our facilities and provides us with an elastic accessory which readily lends itself to momentary adjustment and is of exceptional value when co-ordinated with the electric railway service. The fact that the railway utilities have now more than 300 buses in service in Canada supplementing the

**Presidential address before the Canadian Electric Railway Association at the annual meeting, Toronto, June 6-8, 1928.*

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electric car service is a proof of their desire to furnish the best possible transportation. It is for the public to recognize that the electric car is the most economical mass transportation vehicle, which is not going to be replaced, but that the two vehicles can be co-ordinated to render a "greater transportation service" for the public.

Automobile Teaches Public to Ride

We have, however, a greater problem to face in the private automobile. It has become not only our greatest competitor but the greatest obstacle to our giving rapid transportation service which is so desired by all. It is teaching the public to demand speed, frequency of service, comfort and luxury. Lastly, it is teaching the public to ride. This is something in our favor and we should take every advantage of it and cater to the public by every means in our power. The time is gone when the railway manager could place a number of cars in service and then sit back for the public to use them. Today it is necessary for the progressive operator to find new ways and means to induce the public to use the service. In other words, we of today must get out and sell transportation. If this is properly done the public will respond. It may even be necessary in a large transportation system to introduce a commercial department with a manager whose sole duty it is to interpret the public requirements and to sell the service.

It is, however, necessary to assist the sale of our service by having clean, bright, well-painted cars, courteous employees, smooth roadbed, quiet running rolling stock, and reliable service. If these are not provided you can't sell your transportation. Do not forget that this also applies to the bus. In addition, we have also to meet the new demands emanating from private cars, such as comfortable seating, speed and frequency of service.

May I say to our friends, the civic and other authorities, that the railways are able and prepared to meet these modern demands, but that they can do so only if and when permitted. We have franchises still in existence which limit the speed of the electric car while the motor vehicle is allowed to run at any speed up to 40 m.p.h. Streets originally designed and built for the circulation of vehicular traffic, trade and commerce, are now permitted to be used as public storage yards for a small favored number of automobile owners with the result that the legitimate traffic, trade and commerce are obstructed, causing serious delay to the transportation of 80 per cent of the public using the public transportation system.

De Luxe Rides at Cost

We can provide equipment having the same comfort and ease as the private car but the cost must be met by the car riders—just as the automobilist has to pay for his de luxe ride. It is not the railways' fault, if by fare restrictions imposed by regulatory authorities, they are unable to meet modern public requirements. It is in the hands of the same authorities if the speed of the electric cars is limited by street congestion.

The transportation system, whether publicly or privately owned, is on the same basis as any other industry. The rate of fare must fully cover the cost of production. To impose the cost of pavement on the transportation system or the cost of snow removal or a tax of 3 per cent on the gross revenue is, contrary to the general impression, not an assessment on the transportation utility but a tax on the car rider, for the rate of fare must of necessity meet the full cost of operation. It is of just as great importance to the transportation utility as it is to the public that the rate of fare be kept low, but it cannot be if civic authorities assess and load us down with taxes and other obligations which the car rider must pay.

Yet in spite of all handicaps the electric railway industry has not been standing still, for through economies effected we are giving more and better service today than was thought possible a few years ago. This can be more clearly seen by a comparison with the costs of 1913, which shows that labor is now approximately 200 per cent higher, material 200 per cent, while the average rate of fare of all railways has only increased about 80 per cent. I do not know of any industry which can show such a record.

Traffic Increasing in Canada

I think it is appropriate and it will be of interest to the manufacturers and workers of this country to state that the electric railways of Canada in 1927 paid out in wages approximately $26,000,000 and purchased material to the value of $15,000,000, which does not include capital expenditures covering new development and equipment. We employ more than 17,000 people while there are many more employed indirectly. We have some $229,500,000 invested in our industry, which places us in the front rank of the most important industries of Canada.

Passenger revenue of the Canadian electric railways for 1927 was $48,290,000, an increase of 3.2 per cent over the previous year. Revenue passengers carried were 776,615,193, an increase of 3.75 per cent, while we gave more service to the public by operating 49,800 passenger car-miles per mile of track, an increase of 6.5 per cent.

These figures show a healthy increase and are most encouraging, but I must remind you that the private automobile has not reached its peak and density in this country and that it will require our best efforts to maintain our present position and normal increase. I believe we can afford to be optimistic in regard to the future, and that the electric railways will regain their position in the financial world as a desirable investment.

Finally, I wish to emphasize that the franchise requirements, conditions of operation, rate of fare and municipal taxation are the foundation stone of the whole transportation systems structure. If onerous conditions are imposed by those in authority the channel through which money flows for the maintenance and development of the enterprise will be stifled and the collapse of the system is assured. All transportation systems require additional money every year, but such is attracted only when there is an assurance of a return on the investment.

Where the franchise or operation requirements are such as to assure a fair return on the investment, the transportation system will be up to date, a well-operated property becomes the most valuable asset and the finest advertisement for the community it serves, but there is no worse abomination than a run-down, dilapidated property. If our industry is to fulfill modern requirements of the traveling public a fair return on the investment must be assured by relief from unfair operating conditions and burdens which I have already mentioned.

COMING MEETINGS OF *Electric Railway and Allied Associations*

June 20-27 — **American Railway Association, Div. 5—Mechanical, annual convention and exhibit, Atlantic City, N. J.**

June 21-22 — **American Railway Association, Motor Transport Division, Atlantic City, N. J.**

June 21-22 — **Wisconsin Utilities Association, Accounting Section, Hotel Pfister, Milwaukee, Wis.**

June 25-29 — **American Institute of Electrical Engineers, summer convention, Cosmopolitan Hotel, Denver, Colo.**

June 28-29 — **Central Electric Railway Association, Cedar Point, Ohio.**

July 8-12 — **Public Utilities Advertising Association and International Advertising Exposition, Detroit, Mich.**

July 12 — **New York Railroad Club, annual outing, Indian Point, N. Y.**

July 13 — **A.E.R.A. Executive Committee on yacht "Florida," New York, N. Y.**

July 18-20 — **American Society of Civil Engineers, annual convention, Buffalo, N. Y.**

July 19-21 — **Pacific Claim Agents' Association, annual convention, San Diego, Cal.**

July 25-27 — **Electric Railway Association of Equipment Men, Southern Properties, Cincinnati, Ohio.**

July 27-28 — **Central Electric Railway Accountants' Association, Detroit, Mich.**

Aug. 16-17 — **Wisconsin Utilities Association, Transportation Section, Sheboygan, Wis.**

SEPT. 22-28, 1928

American Electric Railway Association, 47th annual convention and exhibit, Cleveland, Ohio.

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Outing Excursion of New York Railroad Club

ARRANGEMENTS have been completed for the annual outing of the New York Railroad Club on July 12. This will be an old-time excursion up the Hudson to Indian Point, on a specially chartered steamer of the Hudson River Day Line.

The boat leaves at noon and luncheon will be served en route. Upon arrival at Indian Point there will be a parade headed by a special band. In addition to baseball, tennis and swimming, there will be a series of athletic contests: a three-legged race, sack races, a push-ball game, greased pole and a greased pig, besides quoits and a short golf tournament. Prizes for the different events will be provided.

Southern Properties Plan Program

PROGRAM arrangements have all been made for the Cincinnati-Covington meeting of the Electric Railway Association of Equipment Men, Southern Properties, to be held at the Gibson Hotel, Cincinnati, Ohio, July 25-27, according to Robert M. O'Brien, president. Nine prominent men of the association have been requested to prepare papers, so there should be much of interest to all who attend.

The business session on July 25 will open at 9 a.m. The entire day Thursday will be given over to answering the questions in the question box and discussion. On July 27 an inspection trip has been arranged which will consist of a visit to the shops of the Cincinnati Street Railway, the Cincinnati Car Company and the Tool Steel Gear & Pinion Company.

Complete details of the program will be announced later.

Various Claims Subjects to Be Discussed in San Diego

PACIFIC CLAIM AGENTS' ASSOCIATION will hold its annual convention in San Diego, Cal., July 19-21, 1928. The following program will be presented:

"Organization and Value of Safety Committees," by J. H. Handlon, claim agent Market Street Railway, San Francisco, Cal.

"Disciplining Employees Responsible for Accidents," by J. P. Potter, vice-president Key System Transit Company, Oakland, Cal.

"San Diego the Safe City," by Police Sergeant Lyle, Police Department, San Diego, Cal.

"Preparing Cases for Trial; Court Experiences," by M. P. Poundstone, Pacific Electric Company, Los Angeles, Cal.

"Industrial Dentistry," by Dr. Sam Kaufman, Pacific Electric Company, Los Angeles, Cal.

"Recent Court Decisions in Negligence Cases," by A. L. Levinsky, attorney Stockton Electric Railway, Stockton, Cal.

Question box discussions:

"What Methods Should Be Adopted to Obtain the Best Results in Our Relations with Private and Public Hospitals," led by C. M. McRoberts, claim agent Los Angeles Electric Railway, Los Angeles, Cal.

"Obtaining the Good Will of Employees in Accident Prevention," led by B. F. Boynton, claim agent Portland Electric Power Company, Portland, Ore., and followed by S. E. Mason, general manager San Diego Electric Railway, San Diego, Cal.

Association members are also invited to prepare papers on any topic which they think will be of value.

New Car Designs Are Here*

By R. L. Hermann

Transportation Manager Southwestern District Westinghouse Electric & Manufacturing Company, St. Louis, Mo.

DEPARTURE from conventional designs of the past is required if the surface car is to meet operating conditions of today and keep pace with the developments of the future. Safety, speed, comfort and ease of passenger interchange are the primary considerations which influence design. Comfort, of course, includes such features as pleasing appearance and quiet operation.

The first departures from conventional designs were initiated by the Springfield Street Railway and the Chicago & Joliet Electric Railway. These two railway properties each designed and constructed a car equipped with Timken worm-drive axles and Westinghouse high-speed motors. The interesting mechanical features are: motor weight entirely spring supported, high-speed, light-weight motors operated two in series on 600 volts, high gear reductions, automotive-type brakes and quiet operation. Additional cars utilizing this type drive have recently been placed in service, or are about ready for operation, in Boston, Cleveland, Cincinnati, Montreal, Pittsburgh and St. Louis.

The second progressive step in modern car construction was the introduction of the Brill 1928 model which embodies the application of Westinghouse high-speed motors, connected two in series for 600-volt operation, and W-N drive. The mechanical features mentioned in connection with the Springfield and Joliet cars are also included. The car has a pleasing interior and exterior appearance and provides speed with comfort and safety. Cars with this type of motor and drive either are being operated or are about ready for service in Chicago, Cincinnati, Houston, Montreal, Oakland, Pittsburgh, Parkersburg and Richmond.

The need of quick and comfortable transportation is the principal factor that is leading to the introduction of a new type car. Competition of the private automobile has demonstrated the necessity of developing a rail vehicle which is attractive to patrons and fast schedule speed is an essential feature. There are, of course, many things which affect schedule speed, but a car must first be provided with motors and control that have the capacity and characteristics to perform the fast schedules desired.

Schedule speed in frequent-stop city service is primarily a matter of rapid accelerating and braking, and if car movement is speeded up more motor capacity is required. It is not desirable to apply heavier motors to secure more horsepower per car, since car weight is increased and larger wheels may be necessary. High-speed motors and drives which have been developed provide maximum horsepower, minimum weight and ample clearance.

The high-speed motor is available in two sizes, 35 and 50 hp. The weights complete with gears and gear case are 1,000 and 1,350 lb. respectively, and these figures compare with 1,475 and 2,300 lb. for standard motors of the same horsepower. The 35 and 50-hp. high-speed motors can be applied on cars of a size now equipped with 25 and 35 hp. equipments to provide the necessary additional capacity for securing high schedule speeds.

A feature of the two high-speed motors mentioned which has a direct bearing on schedule speed improvement is the adaptability for application on small wheels. The 35-hp. motor can be used on 22-in. wheels and the 50-hp. motors on 24-in. wheels with ample clearance, 4½ in. under both motor and gear case, a material increase over what is obtained with present standard equipment. The lower car floor level possible with the high-speed motors contributes to ease of passenger interchange and safety, while low steps insure rapid movement of riders into and out of cars.

An important accomplishment of the high-speed motor and drive is the reduced unsprung weight obtained with the assembly of truck, motors and gears. The complete motor and one-half of the weight of the gear unit are spring supported, reducing the force of the "hammer blows" at rail joints and special work.

Comparison of spring supported and unsprung weights of standard 25 and 35-hp. motors with the 35-hp. high speed motor including gears and gear case shows that the latter saves 345 lb. per axle or 1,380 lb. per car unsprung weight compared with the standard 25-hp. motor, and 575 lb. per axle or 2,300 lb. per car compared with the standard 35-hp. motor.

Where the changes in speed are uniform high accelerating and decelerating rates are not objectionable. Accelerating and braking rates of 3 m.p.h.p.s. appear feasible.

Light-weight pneumatic and magnetic remote control are recent developments. The inductive effect of the new edge-wound type resistor lowers the accelerating current peaks, permitting more rapid rates without discomfort to pas-

**Abstract of paper presented before the Midwest Electric Railway Association, Kansas City, Mo., June 4-6, 1928.*

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sengers. The weight saving is some 70 per cent in comparison with alloy grids.

Dynamic braking as a means of securing more rapid braking and utilizing the energy wasted in braking for car heating during the winter months with control equipment developed for such applications is being tried on cars in Joliet and Pittsburgh. Two sets of resistors are used, a special heater type mounted within the car, the other, the edge-wound type located beneath the car. The duty on the traction motors is increased considerably, necessitating the use of larger motors and more complicated control equipment. The value of the reclaimed energy for car heating depends on the temperature normally maintained within the cars and the cost of power, both local considerations.

The results obtained with a single car in Joliet, as outlined in an article recently published in ELECTRIC RAILWAY JOURNAL, indicate a very favorable performance. The equipment in service in Pittsburgh has not been operated a sufficient length of time to determine its economic value.

The new type cars which have been built indicate that the street railway industry is endeavoring to improve the character of service provided for car riders. It is evident that the electrical equipment and mechanical features are the subject of careful study and test in an effort to secure improved operating units. Further development may be expected, and the surface car of the future will differ in many respects from the present day conventional design.

Play the Game Square*

By J. N. SHANNAHAN

President Omaha & Council Bluffs Street Railway, Omaha, Neb.

NEVER has there been a time when the future of the electric railway as such was more shrouded with uncertainty than at the present moment. Never has there been a time when it was so necessary that the owners and those charged with the management of these great properties should take their courage in their two hands and go out to do battle for them.

In this day and age the manager of an electric railway not only must have experience to enable him accurately to judge of the problems that confront him, but sand in his crop and brains in his head.

The history of American business contains but few instances of an industry called upon to face so many apparently insuperable obstacles, one so menaced by enemies from without and divided councils within. I believe there are but few, if any, economists or students of the situation who believe that the electric railway can be wiped out except with disastrous results to the communities they serve. The cities of this country must be served by a system of local transport, and in my judgment the backbone of it will continue to be the car running on rails.

The cities that for any reason permit the transportation companies serving them to be destroyed or starved out of existence, will presently find themselves lagging behind their more far-visioned sister municipalities.

Except in certain outstanding instances it seems to me that we ourselves have not met the fast-changing situation with as much courage as we should have, and certainly not with far-sighted vision of our opportunities, to say nothing of our duty.

I believe in the essential fairness of the American people, and that they can be depended on to decide justly and fairly any question with which they are confronted. When they fail so to do I believe a study will show that it was because the question was not clearly undersood by them. And nine times out of ten this is due to the true situation not having been presented in a fair, adequate and understandable way. In my mind there is no doubt if our own houses are in order, if we are meeting our responsibilities squarely and fully, and we and our co-workers are courteous and considerate of the public and its demands, that we can get a fair deal and sympathetic consideration of our difficulties and problems. But to get such consideration, gentlemen, we must come clean. We must put the cards on the table face up. This may sound so trite as to make you smile, but I want to say to you that too many times have I observed a man negotiating with the municipal authorities holding out some vital fact or information that he thought, or imagined, would help to effect a settlement more favorable than would otherwise be obtainable. When this sort of thing is "pulled" we call it sharp practice, and it is exactly that, no matter who "pulls" it. There is no more sure and certain way to forfeit public confidence than to pretend to play the game with the cards face up on the table. And without public confidence any utility man is "sunk." He is "through," and so far as being of any service to the company he is there to administer, he might just as well leave town.

The American people are quick to detect pretense, and relentless when they have unmasked the man who is but pretending to play fair. One false move, one instance of corrupt use of money, and years of straight dealing go by the board, affecting not only ourselves and our own properties, but, indirectly, bringing discredit and suspicion on our innocent associates in the utility field. There are two respects that occur to me in which some of us may help ourselves, and help to put our properties on a sound and stable footing. There are companies struggling to keep afloat while operating under the onerous and exacting terms of an antiquated and hopeless franchise, and again there are companies with so complicated and fearsome a financial structure that any new financing for additions and betterments, however necessary, is made difficult on any reasonable basis or, not infrequently, impossible on any basis. In either of these situations, and there have been companies cursed with both, the owners and their managements should face it squarely and courageously. Nothing is to be gained by blinking at the facts. If your own house is in order, if your record for service and straightforward, honest dealing is clear, then you can go to the city authorities and get from them a new franchise under which you can live and operate successfully, because at all times, and never more acutely than to-day, their interest and your interest is absolutely common.

If your corporate financial structure is such a misfit and so badly conceived as to make difficult or impossible new financing, then you would better undertake voluntarily to put it right before you are forced to a drastic and involuntary reorganization. If we are to enjoy a clear field, and this is what we all must have, then we must expect to meet adequately all fair demands for service. We must take the bitter with the sweet, we must give honest and good service, and we must keep abreast of the times; in other words, our equipment must be modern and the character of our service such that no reasonable man may complain.

I think we all can learn a great deal about this business if we study what has happened in Cleveland during the past few years. In that city has been evolved, after years of bitter controversy and travail, what I believe to be the most workable and satisfactory franchise in effect anywhere in this country. This franchise is not only satisfactory to the company, but the people as well. Cost of the service is the basis or foundation on which has been reared the structure of the Cleveland Railway. The functioning of this franchise is largely automatic and the effect has been to eliminate the company as a football of politics. The result is a property second to none in its physical aspects, a service almost universally satisfactory to the car riders of Cleveland because they themselves, through their accredited representatives, are dictating what that service shall be, and a company on a sound and stable financial footing, one abundantly able to finance on a reasonable basis the cost of any betterments or extensions demanded by the people.

There seems to be no good reason why the rest of us cannot accomplish substantially the same result. Your lawyers may tell you it is difficult of accomplishment in your particular city, or under the laws of your state, but so long as the thing aimed at is clean, and decent, and constructive, I cannot be convinced that a way may not be found for its accomplishment.

*Paper presented before the Midwest Electric Railway Association, Kansas City, Mo., June 4-6, 1928.

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Conditions of Miller Welding Award Changed

NO PAPER submitted to the Samuel Wylie Miller Medal board of trustees of the American Welding Society during the calendar year 1927 was of sufficient value to merit the yearly award, established by Past-President Miller. The board has, therefore, revised the conditions under which the medal may be awarded, as follows:

1. The medal may be awarded annually for any meritorious achievement which, in the judgment of the board of trustees, has contributed conspicuously to the advancement of the art of gas fusion welding and cutting, or the art of electric arc fusion welding and cutting.
2. The award for any calendar year shall be announced and the medal, together with a suitable certificate, presented at an annual meeting or a fall meeting of the society, as the board of trustees may elect.

The conditions governing the award of this medal have been made very broad so that it can be granted for an achievement of any character which has contributed conspicuously to the advancement of either of the two branches of the welding art which are specifically mentioned. Thus, the award may be made for a meritorious paper or an invention, or a conspicuous application of welding in industry which has advanced the art either on account of unique technical features or important economic advantages. The award may even be made for conspicuous service of a non-technical character which distinctly advances the welding art.

California Association Meets

MANY interesting addresses and papers were presented at the California Electric Railway Association annual meeting held in the Cliff Hotel, San Francisco, May 7-8.

Samuel Kahn, president Market Street Railway, opened the meeting with an address outlining the Byllesby policies which have been put into effect during the two years the San Francisco property has been under Byllesby management. Other papers presented were: "Opportunities for Greater Co-operation," by R. B. Hill, Los Angeles Railway; "Problems and Possibilities for Increasing Patronage," by J. P. Potter, Key System Transit Company; "Re-examination of Employees," by Dr. W. L. Weber, Pacific Electric Railway; "The Motor Coach from an Engineering Standpoint," by P. B. Harris, Los Angeles Railway; "What and When to Buy, and Obsolete Material," by C. Thorburn, Pacific Electric Railway; "Economics in Shop Practice," by J. W. Delaney, Market Street Railway; and "Cost and Necessity of Detail Analysis," by R. O. Crowe, Los Angeles Railway.

A banquet was presided over by E. H. Maggard, president and general manager, Northwestern Pacific Railroad, at which E. C. Thomas, manager public relations department, Pacific Electric Railway, was the principal speaker. Mr. Thomas dealt with the public relations problem as it exists within an organization.

Election of officers was postponed until such time as a meeting of the executive committee can be held. The next annual meeting of the association is to be held in Los Angeles during May, 1929.

Wisconsin Accountants' Program

ANNOUNCEMENT has recently been made of the program for the Milwaukee, Wis., meeting of the Wisconsin Utilities Association, Accounting Section, to be held at the Hotel Pfister, June 21-22, as follows:

THURSDAY, JUNE 21

9 A.M.

Registration.

10 A.M.

Chairman's remarks—D. W. Faber, Wisconsin Public Service Corporation, Milwaukee.

"The Story of the Electric Utilities as Presented Before the Legislative Committee," by E. J. Steinberg, service engineer Milwaukee Electric Railway & Light Company.

Discussion.

"An Accountant's View of Municipal Ownership," by Karl F. McMurry, certified public accountant, Madison.

Discussion.

Report of the committee on statistics.

Announcements.

12:15 P.M.

Luncheon Talks

"Proper Basis of Value of Public Utility Securities," by Paul M. Binzel, buying department Morris F. Fox & Company, Milwaukee.

"Making the Office More Convenient for the Customer," by Frank A. Coffin, commercial manager Milwaukee Electric Railway & Light Company.

2:30 P.M.

Inspection trip through offices of the Milwaukee Electric Railway & Light Company.

6:30 P.M.

Annual Accounting Section Dinner.

Dancing.

FRIDAY, JUNE 22

9:30 A.M.

Report of the committee on classification of accounts; chairman, John Dockendorf, the Milwaukee Electric Railway & Light Company.

Discussion.

"Field Auditing," by L. G. Roemer, Wisconsin Public Service Corporation, Milwaukee.

Discussion.

"The Position of the Railroad and Utility Commissioners on State vs. National Control and Regulation," by Lewis E. Gettle, chairman Railroad Commission of Wisconsin.

Discussion.

Report of the nominating committee and election of accounting section officers for the coming year.

1:30 P.M.

"One-tenth of One Per Cent," by Stephen A. Bialecki, credit manager the Milwaukee Gas Light Company.

Discussion.

"Centralized Stores Accounting," by A. A. Meisenheimer, general storekeeper the Milwaukee Electric Railway & Light Company.

Discussion—Led by L. C. Christensen, Wisconsin Public Service Corporation, Green Bay.

"Cost Accounting of the Operation and Maintenance of Farm Line Extension," by J. E. Gray, auditor Wisconsin Power & Light Company, Madison.

Discussion.

Plans for C.E.R.A. Outing Completed

IN ADDITION to the addresses and committee reports, ample entertainment has been arranged for every one attending the Central Electric Railway Association annual outing at Cedar Point, Ohio, June 28-29, including games for children, indoor baseball, bridge for the ladies, a golf tournament at the Plum Brook Country Club, and dancing. The program, which has just been completed, is as follows:

THURSDAY, JUNE 28

9:30 A.M.

Address of welcome, by the Mayor of Lake Erie.

Address of the president, by W. S. Rodger, general traffic manager Detroit United Lines, Detroit, Mich.

"What Does the Future Hold for Interurban and City Lines in the Middle West?" by Charles W. Chase, president Gary Railways, Gary, Ind.

"Outside Observations of the Electric Railway Industry," by H. V. Bozell, Bonbright & Company, New York, N. Y.

2 P.M.

Meeting of executive committee.

6:30 P.M.

Association dinner and entertainment (informal).

FRIDAY, JUNE 29

9:30 A.M.

Reports of Committees

Constitution and by-laws, by F. D. Carpenter, chairman, president Western Ohio Railway Co., Lima, Ohio.

Supply men, by E. H. Arnott, chairman, manager Central Service Bureau, Indianapolis, Ind.

Power supply and distribution, by R. J. Custer, chairman, engineer way and structures Interstate Public Service Company, Columbus, Ind.

10:30 A.M.

"Employees Welfare and Publicity Work," by Clinton D. Smith, superintendent department of personnel Cleveland Railway, Cleveland, Ohio.

"Employees Education and Salesmanship," by R. N. Graham, manager of railways Pennsylvania-Ohio Electric Company, Youngstown, Ohio.

Report of committee on promotion of more profitable business, by L. G. Tighe, chairman, assistant general manager Northern Ohio Power & Light Company, Akron, Ohio.

Address, by J. B. Dugan, secretary Public Utilities Commission, Columbus, Ohio.

Adjournment.

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Need for Progress Stressed at New York State Meeting

MORE intelligent use of available street space, more scientific selection and training of employees, application of common sense and fair dealing in the improvement of public relations, and better facilities for equipment maintenance were urged at the annual meeting of the New York Electric Railway Association held at Coney Island, N. Y., on June 14-15, 1928.

The meeting, which completed the 46th year of the association, was replete with papers urging the need for a changed viewpoint and improved methods suited to meet present day transportation conditions. President W. G. Gove presided. Speakers included J. A. Miller, Jr., editor *Aera* and associate editor ELECTRIC RAILWAY JOURNAL; H. S. Simpson, traffic engineer Essex County, N. J.; L. S. Storrs, managing director American Electric Railway Association; C. P. Segard, assistant secretary Third Avenue Railway, New York; A. L. Hodges, assistant general manager Brooklyn City Railroad; R. R. Hadsell, general superintendent of transportation New York State Railways, Rochester; Dr. Philip Convoy, chief surgeon New York State Railways; B. J. Yungbluth, president International Railway, Buffalo; Hugh Savage, superintendent of equipment Brooklyn City Railroad; Niles Persons, superintendent surface lines shops, Brooklyn-Manhattan Transit Corporation; E. C. Brandt, assistant works manager Westinghouse Electric & Manufacturing Company.

TRAFFIC RELIEF WITHOUT EXCESSIVE COST

Substantial relief from existing street traffic congestion can be obtained without the enormous expenses involved in many proposed remedies. This was pointed out in Mr. Miller's paper. He argued that the capacity of present streets can be increased several hundred per cent by utilizing the entire roadway for moving traffic, and by utilizing signal lights effectively to speed up the movement. Despite all that can be done to increase the efficiency of traffic movement, however, the majority of riders must continue to use public transportation vehicles. Agencies which furnish public transportation will benefit by anything that improves general traffic conditions, according to Mr. Miller.

In discussing this paper, Mr. Simpson condemned as impractical the visionary schemes of multi-level cities of the future, which have become the vogue in Sunday newspaper supplements. He compared the costly construction of Wacker Drive in Chicago with the comparatively inexpensive installation of co-ordinated traffic lights, and the "no-parking" regulations which have afforded more relief than the half-mile of double-deck street. Traffic lights should be installed as the result of engineering study, he said, not as the result of manufacturer salesmanship.

Mr. Storrs pointed out that public transportation vehicles should be so operated as not to impede other traffic. More rapid acceleration and braking are needed. Public transportation officials must take the lead in the solution of the traffic problem.

Electric railways have given more attention to the selection of their equipment than to the selection of their men, according to Dr. Segard. Man power, however, determines production and quality of service. Greater attention should be given to the selection of men.

Mr. Hodges spoke of the necessity of finding the right job for every employee. His training should continue as long as he is employed by the company. Mr. Hadsell pointed out that it is desirable to have more than one examiner pass on each applicant for employment, as frequently a second or third interview will disclose things which escape the earlier examiners. Dr. Conway emphasized the need for stringent examinations of the eyesight of applicants for employment on electric railways.

Under the title of "How I.R.C. Is Building Good Will," Mr. Yungbluth characterized the International Railway's efforts to improve its relations with the public of Buffalo, as merely the application of common sense to the job of winning public confidence and good will. To illustrate the methods used for developing a spirit of teamwork among employees and for telling the railway company's story to the public, large photographs of typical employee activities and reproductions of publicity material were displayed in the meeting room.

Lack of progress in car cleaning methods was emphasized in the paper by Mr. Savage. He drew a striking comparison between the progress made in many phases of railway operation and maintenance, and the comparative inefficiency of available car cleaning methods. The attention paid to keeping cars clean, he held to be out of proportion to the importance of clean and sanitary equipment in affecting riding and public attitude toward a transportation company's service.

Niles Persons carried the discussion of equipment maintenance further in a paper outlining the need for adequate electric railway shop and machine facilities. He described briefly the new shops and equipment recently completed by the Brooklyn-Manhattan Transit Corporation in Brooklyn, both for the maintenance of surface and rapid transit equipment. The manufacturer's view of the electric railway maintenance problem was presented by E. C. Brandt. He argued for the use of high-grade replacement parts, supplied preferably by the original manufacturer of the equipment, and explained the organization and viewpoint of the Westinghouse renewal parts division. Mr. Brandt attributed the practice of home manufacture of parts by many railway properties to the failure by the manufacturer in the past adequately to understand the operators' replacement parts problem.

J. M. Fitzgerald, a member of the Eastern Conference of Railroad Executives, was the principal speaker at the dinner on Thursday evening. He outlined the development of transportation in the United States, citing the motor vehicle and the airplane as the most recent addition to the companies' permanent transportation facilities. He deprecated the expenditure of public money in visionary and economically unsound waterway transport schemes and pleaded for a spirit of fair play in dealing with transportation, strong enough to resist personal or community advantage at the expense of the general good.

Upon recommendation of the nominating committee, presented by its chairman, H. B. Weatherwax, the following officers and directors were unanimously elected for the ensuing year:

President, W. E. Thompson, vice-president Third Avenue Railway, New York;

Association Papers Coming!

SO MANY excellent papers and addresses have been presented at the recent meetings of the Midwest Association, the Canadian Association, the New York State Association and the Union Internationale de Tramways, de Chemins de fer d'Intérêt local et de Transports Publics Automobiles, that it has been entirely impossible to publish them all in this and the preceding issues. Many of them are referred to in the general reports of the meetings published in this and last week's issue. Watch for the articles!

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First vice-president, Ernest A. Murphy, general manager United Traction Company, Albany;

Second vice-president, Roy R. Hadsell, general superintendent of transportation of the New York State Railways, Rochester;

Third vice-president, A. L. Hodges, assistant general manager Brooklyn City Railroad;

Secretary-treasurer, W. F. Stanton, assistant to president New York State Railways, Rochester;

Executive committee: W. S. Menden, J. F. Hamilton, S. W. Huff, H. B. Weatherwax.

Friday was devoted to an inspection of the new Brooklyn-Manhattan Transit shops at Coney Island, which are considered the largest and best equipped electric railway maintenance shops in the world.

American Association News

Engineering Program

CHAIRMEN of the various standard committees of the Engineering Association outlined their programs for submission to the executive committee at a meeting held at the Association headquarters, New York City, June 12. Those present were: Howard H. George, chairman; John Y. Bayliss, W. E. Bryan, and A. T. Clark.

There will be three sessions, on the afternoons of Monday, Wednesday and Thursday. The sessions for Monday and Wednesday will be divided into the various divisions of power, rolling stock, track, and purchases and stores. A joint session will be held on Thursday. In the rolling stock division reports of special committees will be presented on Monday. On Wednesday it is proposed to have two papers presented. The subjects suggested were lubrication and trends in new rolling stock.

In the way and structures division reports of special committees will be presented on Monday and Wednesday. There will also be a number of short addresses on both of these days made on subjects which are of outstanding interest to track and way men.

In the purchases and stores division the Monday meeting will be devoted to presentation of papers dealing with the high spots which have been studied by various committees of the division during the past year. On Tuesday it is proposed to have a luncheon conference, and Wednesday will be taken up by a joint session with the accountants. At this session papers will be presented which are of joint interest to both divisions.

The general and business session of the engineering association will be held Thursday. In addition to the various routine reports, election of officers, etc., at that meeting, there will be a paper of general interest presented. The subject suggested is economics of labor-saving machinery.

Motor Brushes

DISCUSSION of methods for reducing side wear of motor brushes formed the principal topic at a meeting of rolling stock special committee No. 8, motor brushes, held at association headquarters, New York City, on June 6. Those present were R. A. Hutchins, chairman; H. E. Childs, J. Markel, F. W. McCloskey and R. D. Voshall.

Tests and investigations made by the committee showed that side wear is due largely to dust and dirt that gets into brush-holders. Side wear of brushes is much greater with the ventilated type motor, and manufacturers have been altering designs so that ample ventilation is obtained without drawing in air with dust so that dirt is deposited on brush-holders.

The committee has investigated numerous means that are being tried to reduce side wear and the report will include results accomplished. Limits of wear for brush-holders and brushes were agreed upon.

Current Collecting Devices

ROLLING stock committee No. 11, current collecting devices, held a meeting at association headquarters, New York City, on May 21. Those present were Hugh Savage, chairman, H. S. Murphy, W. Schaake, and R. E. Wade. The committee went over a tentative report of the work done during the past year, and made suggestions for additions and corrections.

This year's study has been devoted to three classes of current collecting devices: (1) Wheel collector with pole; (2) sliding shoe collector with pole and base; and (3) pantograph collector with sliding contact. Information was collected by means of questionnaires. These have been analyzed and the various types in use have been tabulated with a view toward standardization. An effective means of visualizing the answers to the questionnaire is used by the committee in the form of spot diagrams. This shows the results in such a manner that the reader can see at a glance just what the answers were. Tabulations on trolley wheels gave information on the shape of groove, depth of groove, width of wheel, diameter of axle pin, length of bearing and thickness of bushing. Proposed standard trolley wheels were discussed and will be incorporated in the report.

Information on standard length for trolley poles has been assembled and analyzed. Design of trolley base that meets most general conditions of railway service will be presented by the committee, together with standard recommendations for certain details that are considered essential.

New Bulletins

SEVERAL special reports are being prepared by the Bureau of Information and Service of the American Electric Railway Association and will be available upon request. These are:

Bulletin No. 202 — Operating Costs of Electric Railway Motor Bus Lines 1927.—Based on the reports of all companies that have reported their operations. There is also shown a comparison of operating costs in 1927 and 1926, based on those companies that were able to report data for two full years. The operations have been classified as city, interurban, or combination city and interurban service, and a separate statement and analysis of cost prepared for each class. Details of average operating expenses are given for each group.

Bulletin No. 203 — Comparison of Electric Railway Operating Conditions, Operating Expenses and Results of Operation on Various Unit Bases 1927 —Part I, City Lines.—This is a tabulation of comparative unit figures and ratios derived from the operating reports of electric railways for 1927. The cities are grouped according to their population and there is shown for each city riding habit, average speed, number of revenue passengers, car-miles per mile of track and per car operated, revenue per mile of track, operating ratio, number of passengers per car-mile, proportion of passengers using transfers, cost of maintenance of plant and equipment per car-mile, per unit of property maintained and in percentage of total operating expenses. The operating expenses as distinct from maintenance expenses are also given on comparative unit bases and in percentage of total expenses.

Bulletin No. 204—Relief from Paving Burdens.—An up-to-date review of developments in the movement to obtain relief from state and municipal requirements to pave, repave or maintain the pavement along the electric railways' tracks, with accounts of all cases in which relief has been obtained. It contains all of the cases included in Bulletin No. 125, issued Feb. 1, 1927, and, in addition, it covers all cases in which relief from paving has been obtained since that date.

Bulletin No. 205 — Excursion and Chartered Bus Rates.—A tabulation of the rates charged by electric railways for special bus excursion trips and also the rates fixed for chartered buses, based on answers of 166 electric railways to a questionnaire on this subject.

The following supplements also have been prepared, bringing the information they cover down to date.

Supplement No. 8 to Bulletins Nos. 163 and 164: "Electric Railways Fares."

Supplement No. 3 to Bulletin No. 188: "Wages of Trainmen."

Supplement No. 3 to Bulletin No. 189: "Wages of Bus Men."

Cost of Living Studies (Bulletin No. 206).

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News of the Industry

Nine Cents in East Cleveland

Arbitrators authorize Cleveland Railway to install sliding scale in suburb. Await probable change in Cleveland Heights

THE Cleveland Railway recently won its plea for a higher car fare in East Cleveland, Ohio. An award was made by Arbitrators E. W. Doty and Charles Higley fixing the rate for a through ride between Cleveland and East Cleveland at 9 cents, with six tickets for 50 cents. Charles M. Buss, the third arbitrator, refused to sign the award, charging the increase was not justified by the evidence. The award established a sliding scale of fares for East Cleveland, rising or falling with the Cleveland rate, with a variable differential. The differential will be in effect only for a ride between Cleveland and East Cleveland. For a local ride between any two points in East Cleveland the fare is to be the same as that charged in the city of Cleveland.

A complete schedule of fares was established for a through ride from Cleveland to East Cleveland, with a different rate for each possible Cleveland rate. If the maximum rate of 10 cents, six tickets for 50 cents, should go into effect in Cleveland, the East Cleveland rate would be 13 cents, four tickets for 50 cents. If the minimum rate of 2 cents should go into effect in Cleveland, the rate for East Cleveland would be 3 cents, eighteen tickets for 50 cents. Between these two extremes, seventeen intermediate steps are set up.

The new rate goes into effect on June 19 for a period of five years. In the last five years, East Cleveland has been paying the same rate of fare as Cleveland. Although the basic rate in the East Cleveland franchise is 5 cents, this is modified by provisions that the fare shall never be less than the Cleveland rate and that the rate may be the subject of arbitration every five years.

The award is a milestone in the history of Cleveland railway affairs. It is the first time in the eighteen years' history of the Tayler grant that the service-at-cost provisions will have been extended to a suburb. There is considerable expectation that the same differential will be acceptable to Cleveland Heights, which has been negotiating for three years for a new franchise and extensions, and that eventually Lakewood, the third large suburb of Cleveland, may be prevailed upon to accept the differential.

Since about half the traffic on lines entering suburbs originates in the suburbs, the losses in suburban operations have been one of the large factors in increasing the Cleveland rate of fare. Another factor responsible for a 7-cent fare in Cleveland is the obsolete and costly routing of some of the Cleveland Railway lines under the direction of the Cleveland City Council. Receipts of the Euclid Avenue line will be increased by $150,000 to $175,000 a year as a result of the East Cleveland award. This will postpone for a long time the prospect of any further increase in the Cleveland rate of fare even if there is no appreciable increase in the number of passengers carried.

In an *obiter dictum* attached to the end of their opinion, the arbitrators took occasion to urge the Cleveland Council to adopt a zone system of fares. The East Cleveland situation is complicated by the fact that the city of Cleveland extends east of the suburb. Both East Cleveland lines run from Cleveland, through East Cleveland and terminate in Cleveland. The Cleveland riders living beyond East Cleveland will get a longer ride than the East Clevelanders, and they will still pay the Cleveland rate of fare.

The problem is complicated for the Cleveland Railway by the need for devising some system that will offer the least inconvenience in distinguishing between Cleveland and East Cleveland riders.

Terminal Lease Approval

I.C.C. authorizes Illinois Terminal Company to lease lines of St. Louis, Troy & Eastern, St. Louis & Illinois Belt, St. Louis Electric Terminal and main division of Illinois Traction

FOLLOWING the decision of the Interstate Commerce Commission authorizing the Illinois Terminal Company to acquire control of four other steam and electric lines serving St. Louis and many points in Illinois—the St. Louis, Troy & Eastern, the St. Louis & Illinois Belt Railway, the St. Louis Electric Terminal Railway and the lines comprising the main division of the Illinois Traction, Inc.—the Illinois Power & Light Corporation purchased all the stock of the Illinois Terminal Company for $7,500,000.

Clement E. Studebaker, president of the Illinois Power & Light Corporation, was made chairman of the board of the new company, and George M. Levis, president of the Illinois Terminal Company, and William E. Levis, also a stockholder of the Illinois Terminal Company, were made members of the board of the new company. Officers of the new company are: L. E. Fischer, president; H. H. Ferguson, vice-president in charge of the steam division; D. W. Snyder, vice-president in charge of the electric division; Henry I. Green, general solicitor; George T. Buckingham, general counsel; P. L. Smith, treasurer, and D. H. Holmes, secretary. These officers are also members of the board of directors.

In concluding its decision authorizing the Illinois Terminal Company to acquire control by lease of the four railways mentioned the Interstate Commerce Commission summarized the advantages from the standpoint of public interest taking cognizance of the testimony of an executive of the Illinois Power & Light Corporation. That official said that it was a matter of great importance to the people of central Illinois that the service of the Traction Company be preserved and that this would not be possible without the kind of relief proposed; that the contemplated economies would be of benefit to the shippers because the savings would ultimately be reflected in tariff reductions; and that the unified and improved system would promote development of the territory served. Finally, it was urged, the applicant's proposals would conform to public policy in effecting a union of weak and strong lines. Witness insisted that the proposals were not in-

200 Industries on New Belt Line

THE joining of facilities of these several companies gives this unified transportation system the benefit of a vast amount of freight tonnage in the Alton industrial district, the industrial district to the east of the Mississippi River at St. Louis and the coal territories; as well as an outlet via the Illinois Traction System to the north and through interchange with other railways to any point in the United States and Canada.

In effect, these lines form an outer belt around a section which promises to be one of the country's greatest industrial regions. With Alton on the north and Belleville on the south they link it directly to St. Louis by way of the McKinley Bridge, and reach out by steam and electrified lines to central and northern Illinois, and connecting lines to other points. The system serves exclusively more than 200 industries and reaches 3,000 others through reciprocal switching arrangements.

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tended to work injury to any other carriers. It was hoped, through expedited service, to obtain a normal amount of business, but it was not intended to develop a switching road.

The commission held that the proposed acquisitions of control would be approved upon condition that, so far as lay within its power, and unless and until otherwise ordered, the applicant should preserve existing routes and channels of trade and commerce established by other carriers in connection with the applicant or by the applicant in connection with other carriers, maintain existing gateways for the interchange of traffic with such carriers, and continue the present neutrality of handling traffic by the applicant, so as to permit equal opportunity for service and routing or movement of traffic which may be competitive with traffic of the unified system to and from all lines connecting with the applicant's line, so long as the carriers operating those lines desire the maintenance of such existing routes, without discrimination in service against such competitive traffic.

Upon the facts presented, the commission was of the opinion that the proposed leases would be in the public interest; and that the considerations and terms and conditions of the proposed leases were just and reasonable.

In connection with the approval of the purchase of all the stock of the Illinois Terminal by the Illinois Power & Light Company certain provisions follow in part:

Except as to parties and rentals payable to the lessors, the terms of the proposed leases are to be substantially identical.

They are to be dated as of Jan. 2, 1928, and are to be for 99 years, beginning Jan. 1, 1928, but may be sooner terminated at the option of either party upon six months prior notice in writing or by default. The annual rentals payable to the respective lessor companies are as follows:

The Traction Company, $650,000; the Electric Terminal, $190,000; the Troy and the Belt, $160,000; total, $1,000,000.

In support of the applicant's proposals herein, it is urged that operation of the properties of the applicant and of the lessors under common control and management will result in large economies in the costs of operation, better service through more prompt and expeditious movement of traffic, preservation of the service performed by the traction company, and opportunities for the development of coal fields and for the location and expansion of industries along the routes traversed by the lines of the proposed unified system.

Each of the operating carriers serves territory not served by any of the others, so that none of the proposed lessors compete with the applicant or with each other.

The proposed rentals are just and reasonable, it is contended, because they bear an appropriate relation to investment, are sufficient to provide for fixed charges of the lessors, and are within the unified system's earning power as demonstrated by past experience.

The Terminal Company owned and operated 15 miles of railroads in Madison County, Ill., and several miles in St. Clair County. The Troy, also an Illinois Corporation, owned and operated lines in southern Illinois. About five miles owned by the Belt was under lease by the Troy. The Electric Terminal, a Missouri corporation, owned and operated an electric railway from Granite City, Ill., to St. Louis. The Illinois Traction, Inc., was formed in 1923 under the laws of Illinois by the consolidation of five constituent electric railways.

Originally conceived primarily for the transportation of passengers, the traffic of the lines comprising the Illinois Traction Company's system has been materially affected by extensive construction of improved highways in the territory served. Practically all the lines are paralleled by one or more hard roads and the Traction Company is facing motor-vehicle competition over practically every mile of its lines. The ratio of the passenger revenues to total earnings has declined steadily from 83 per cent in 1910 to 43 per cent in 1927. This change in the business of the system has been accompanied by substantial losses. Thus, although dividends aggregating $455,006 were paid in the period 1904-1907 and in 1917, losses sustained by the various proprietary interests from 1908 to 1916 and from 1918 to 1926 aggregate $7,092,934, after crediting dividends received. In view of these and other considerations the commission agreed with the summary of the advantages of the proposed leases, from the standpoint of public interest as outlined by an executive of the Power company that it was a matter of great importance to the people of central Illinois that the service of the Traction company be preserved and that this would not be possible without the kind of relief proposed.

Commuter Fares Raised on Key System

Local fares kept at 7 cents. Company not getting a fair return. Censure for railway in not trying out commission's 5-cent zone plan

FINDING that the Key System Transit Company is now in serious financial difficulty, due to inadequate return from its transbay and local traction operations, the California Railroad Commission on May 29 authorized monthly commutation fares of $6.50 between San Francisco and East Bay points, with the exception of Richmond, Point Richmond, Pullman and San Pablo, for which a monthly rate of $7 was set.

The commission also took similar action with respect to the application of the Southern Pacific Company for an increase of transbay and local railway fares.

The monthly commutation fare between San Francisco and points on the Southern Pacific interurban lines is fixed at $6.50, with the exception of Sequoia Avenue, where the rate is made $6:65, and Dutton Avenue and Stonehurst, where the rate is made $7.

The commission as indicated in the ELECTRIC RAILWAY JOURNAL for June 2, page 917, held open the proceedings with respect to local fares on the Key System Transit Company's lines until such further time as the company by resolution of its directors may petition the commission for authority to file fares which it believes will most nearly meet the exigencies of the local situation.

Commissioner Seavey, in his opinion, points out that urban transportation is in a serious period of transition. Competition of the private automobile and buses is making serious inroads into, or is transplanting, the old method of transportation. In many instances the change has entirely taken place, either by a total abandonment, or by transplanting street railway service with automobile service.

Commissioner Seavey observes that the record seems to indicate that the wolf has been kept from the door of the street railway longer in those cities where there has been a direct assumption of municipal responsibility for operation, or full and open public cooperative arrangements between local authorities, and the utility, and concessions made on both sides, and experimental rates tried with joint approval. He felt he could not recommend any of the forms of experimental fares discussed in the hearings. He says:

Any such action would be in the nature of questionable experimenting with a situation extremely hazardous both to the applicant and to the public. The company itself should, if possible with the aid of local authorities, prepare the way for some form of fare experimentation, and other means of lessening the stress on this system, that appears to have more reasonable chance of success.

The order results in the one-way transbay fare of 21 cents remaining as at present on both the Key and the Southern Pacific systems, the commission holding in effect that the present one-way fare is as high as it could reasonably be made in comparison with local and commutation fares after the adjustment of the latter. The present 7-cent local car fare is also unchanged. The companies asked for fares of 25 cents and 10 cents, respectively.

Company Accepts Key System Decision

PRESIDENT A. J. Lundberg of the Key System Transit Company has issued a statement in which he says the company will accept the commission's decision. He is quoted as follows:

While the company did not receive the fare structure for which it applied, it will accept the present order of the Railroad Commission and will exert itself to the utmost to achieve every possible economy along the lines pointed out by the commission.

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Commissioner William J. Carr filed an opinion concurring in part and dissenting in part from the majority opinion of the commission. He declared himself in general agreement with his associates that some substantial relief must be given the Key System, but that he is not in entire accord with the other commissioners as to the nature of the relief, or the kind of order which should be made. The rate of return on the cost of its properties is less than 3 per cent, he points out. Commissioner Carr says:

> Questions usually important in rate proceedings are here unimportant, for here the question insistently forces itself to the front —"can any system of fares having some semblance of fairness between classes of riders be devised, which will make it possible for this company to exist and to continue to serve the great populations tributary to its lines?"

He calls attention to the fact that previous attempts of the commission to relieve the company's situation through increases in fares failed to produce the expected results. Instead of producing an annual increase of revenue of $846,000 the increased fares produced an increase in 1926 of only $280,000, and only $135,000 increase in 1927.

Competition, both of the privately-owned automobile, and potential bus competition with the traction service, in the event that the fares are again increased, will most likely be the determining factor in fixing the rates that can be charged by the railway, he declares.

Commissioner Carr holds that any such increase of fares is futile if the public will not ride. Competitive and economic conditions have become far more potent than the order of any regulatory body such as the Railroad Commission, he states. To a very large extent the riding public fixes and determines the rate of fare.

Commissioner Carr agrees with his associates that increased transbay fares should be authorized, but there is a limit upon the fares which may reasonably be imposed upon this class. They should not have to carry the entire burden of the unprofitable traction system.

Casual Rider Should Pay Increase

Commissioner Carr favored leaving the commutation fares substantially unchanged and to seek increased revenue from the casual or occasional riders.

He agrees that the present fare structure is unreasonable in the sense that the fare does not yield any substantial return on the property. He does not believe that the commission would be warranted in ordering any other experimental plan of local fare than that proposed by the company, namely, a 10-cent fare with a $1 weekly pass. However, Commissioner Carr is in entire accord with his associates that competitive and economic conditions will largely determine the level and kind of fares. He feels that any experimental fare structure to which the company is opposed would never receive a fair trial and would be sure to fail. He believes the company should be given some reasonable latitude in establishing new fares which it believes will, under existing competitive conditions, yield something in the way of a return. He believes the company should be given an opportunity to try out its plan.

Commissioner Ezra W. Decoto also filed separate opinion concurring with the majority opinion, with one exception. He declares that from his study of the record in this case it is clear that there is no street car fare proposed. or that can be devised at this time, that will yield a grerater gross revenue than the fare now in force.

Better Position With 6-Cent Rate

In his opinion Key System Transit Company would be in a better position now from the point of gross earnings if it had left in force the 6-cent fare. He points out that following the increase of 1 cent in the local fare there were 4,000,000 fewer rides in the first seven months it was in effect. He says:

> These 4,000,000 rides did not vanish in the thin air. They represent people who took the automobile or to walking. This company cannot compete with the privately-owned automobile or with buses, or with the tendency of the people to leave the street cars, by raising the cost of street car travel.

Commissioner Decoto calls attention to the springing up of local business districts at short intervals throughout the transbay territory, ranging from a few stores to several blocks of stores, and including a moving picture house, seating upwards of 1,000 people. There are very few sections served by the company that are not within easy walking distance of these business centers. This has created a tendency to buy in the immediate vicinity of one's residence, thus lessening street car riding. A raise of fares would certainly tend to accentuate this tendency, he declares.

Commissioner Decoto calls attention to the fact that the commission has repeatedly emphasized that the solution of the Key System's difficulties lies in rigid economies, reduction in operating expenses, and the abandonment of duplication of services by it and the Southern Pacific Company. In his judgment complete operation of a one-man car system on the traction lines would save $350,000 a year.

Commissioner Decoto believes also that regulation of street car fares seems to have passed from the realm of regulation by the commission into that of regulation by competition, and that the competition now furnished by privately owned automobiles will be augmented by competition by buses as soon as street car fares approach 10 cents. For this reason, he believes, that for the next several years, or until the community served by the company becomes most densely populated, the company cannot hope to obtain the rate of return usually allowed to public utilities, through any combination of street car fares that can be devised.

Commissioner Decoto does not concur in leaving the street car fares open for further consideration. He believes that little additional can be learned by further study of the problems, and for this reason local fares should be fixed definitely at 7 cents and the case closed.

The Key System Transit Company has accepted the decision of the California Railroad Commission raising transbay commuter fares to $6.50 from $5.20 monthly but leaving all other rates unchanged. The rate decision adds only about $175,000 annually to Key's income on the present traffic basis, whereas the company holds its needs at least $1,000,000 additional annually. The company will attempt to meet the situation by severe economies.

Higher Rates on Cincinnati Interurban

Unless prevented by the Ohio Public Utilities Commission, increased fares will be charged by the Cincinnati, Hamilton & Dayton Railway beginning on July 1. Officials announced on June 9 that they had filed a new tariff with the commission. The new rate will average about 2⅓ cents a mile. This the company says is lower than that of any other transportation system between Cincinnati and Dayton, Ohio. Actual fare between the points, now $1.30, will be $1.40.

Officials said a year's operation following reorganization showed the fare was too low. The company just about "broke even" during the year. About $2,000,000 was spent in improvements.

Seven Railroads Aligned Against Electric

Seven railroads opposing the extension of the Piedmont & Northern Railway in the Carolinas have filed suit in federal court at Greenville, S. C., asking to be made "parties defendant" with the United States government in a suit by which the Piedmont & Northern seeks to set aside an adverse ruling of the Interstate Commerce Commission on the extension project. Judge H. H. Watkins set June 12 as the date for the Piedmont & Northern to show cause why the petition should not be granted.

Simplifies Transfer in Denver

With the adoption of the one-man car on its major line, and to expedite the loading of passengers and incidentally relieve the car attendant from three or four movements in issuing transfers, the Denver Tramway, Denver, Colo., has issued a new and improved form of transfer slip. As opposed to the old ones on which the conductor punched the time, place of transfer and direction all he punches on the new form is the time. The passenger is privileged to transfer to any car line, going any direction at any intersection of the line from which he or she alights. The only restriction is that the passenger cannot use a transfer in either direction on the line of issuance.

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Status of Cincinnati's Construction Explained

When, if ever, the underground "tube" of Cincinnati's Rapid Transit system will be utilized by trolley cars, the subway extended downtown and other changes made which were suggested in the Beeler report, seems to be still in doubt with the approach of the second half of the year. It was stated on June 4 by Frank Raschig, chief engineer of the city, that the construction work of the entire Central Parkway (the surface of the system) from Broadway to Ludlow Avenue, would be completed before Dec. 31. On that date, the life of the Rapid Transit Commission ends by mandate of the city charter.

The charter provides that the commission shall cease to exist "upon the completion of the rapid transit system and in any event not later than Jan. 1, 1929." It is regarded as improbable that even the submission to the electors of a negotiated lease and an additional bond issue will be made in years. The charter further provides that when the commission ends, "its powers shall be transferred to such officer or officers as the Council shall direct." Some of the powers, however, it is claimed, must legally rest in the City Council, since they are purely legislative. Executive and administrative powers are expected to be transferred to the city manager.

The Rapid Transit Commission, as now constituted, has been in existence about fifteen years. The present membership of five is headed by E. W. Edwards. At first the commissioners were unsalaried, but afterwards were paid $3,000 a year each. These salaries were met out of bond issues, and legal right to do this was questioned, the matter being now in the courts. At the time the commission was organized, a real need was felt in the city for a rapid transit system, but with the increasing use of automobiles and the improvement of other transportation factors, operation of a rapid transit system such as that originally projected was felt to be so uncertain of returns that the Cincinnati Street Railway offered to operate cars on it only with suitable guarantees —guarantees which the city has not thus far felt justified in making.

Arbitration at Toronto

The members of the Toronto Street Railway employees' union have decided to submit their case to arbitration. D. W. Harvey, general manager of the Transportation Commission, has stated his satisfaction with the proposal. The principal point at issue is the question of a vacation for the men with pay similar to that granted by the city to other employees. The *Post* said:

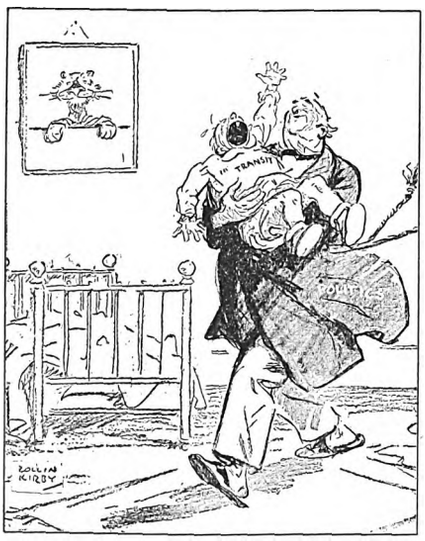
Toronto is generally well satisfied with its railway system. It has confidence in the Transportation Commission and in General Manager Harvey, and believes they are wrestling earnestly and effectively with the problem of giving the public the best service at reasonable cost. It does not desire, however, to see any injustice done to those upon whom the stress—and the success—of the service so largely rests. The decision to submit differences to a competent Board of Arbitration is highly satisfactory.

Another Move Toward Unification in New York

A plan of rapid transit unification which is substantially the proposal originally advanced by Samuel Untermyer, special counsel for the New York Transit Commission, will be submitted by Mr. Untermyer to the Transit Commission, the Interborough, Brooklyn-Manhattan Transit Corporation and Manhattan companies and the Board of Estimate soon after July 1. The plan is intended to be a basis for further negotiation between the city and the companies.

It is understood that the Brooklyn-Manhattan Transit Corporation representatives have indorsed the plan in principle, but the price which that company would be willing to accept for its subway and elevated lines is still far from agreed upon.

Transit Policy: A Change Needed



There is no more urgent problem before the city today than that of transit. It is now clear that its solution will have to be undertaken in a spirit wholly different from that which has characterized the proceedings of the past eighteen months. The task calls for the services of a group of competent, public-spirited and non-partisan citizens who harbor none of the old grudges. Such a group, working in the interest of a reasonable settlement and possessing the confidence of the community, should encounter no insuperable difficulties in bringing the city and the companies together on a program which will be fair alike to the city treasury, the strap-hangers and the companies. This suggestion is not a counsel of perfection; it is entirely practicable. It does call, however, for a change of policy and of personnel, and the recent barren record shows that such a change is in order.—*New York World.*

Biddeford Company Thrives on Low Fare

If riding does not increase on the branch line operated by the Biddeford & Saco Railroad between Sanford and Biddeford via Kennebunk it is expected the company will turn the property back to the York Utilities Company from which it has been renting the track on a day-to-day basis. This branch line operation in no way concerns the regular route of the Biddeford & Saco Railroad operating on a 5-cent fare since 1887, carrying approximately 1,500,000 passengers each year and paying dividends for the past 22 years.

In September, 1927, the York Utilities Company, which operated cars between Sanford and Biddeford, Me., about 2½ miles, decided to discontinue the line. It seemed to offer possibilities of continuation if linked up with the property of the Biddeford & Saco Railroad. That company took over the operation of one car on this line at a 5-cent fare which was just half of what the York Utilities charged on this zone. For a time the company made money, but as industrial conditions became worse and the newness of the service began to wear off, riding decreased rapidly. A cut in the schedule did not solve the problem. When, in January of this year the company signified its intention of quitting, a petition of 39 residents was forwarded requesting that the fare be doubled. The Public Utilities Commission approved the plan and operation was started on a 10-cent fare. This, too. started with a favorable showing, but now receipts have slackened.

The Biddeford & Saco Railroad is attracting attention in New England for its interesting and progressive advertising. A recent advertisement in the papers entitled "Our Challenge" invited someone to name any other company in America of like size serving a similar community on a 5-cent fare. In the Biddeford *Daily Journal* of May 5, under "People's Forum," J. B. Stride, general manager of the property, sent a letter to the editor on unfair competition typified by the popular pick-up of potential passengers. Congratulations came in so fast from the public for his views that the company ran a "thank you" ad the following Monday.

West Penn Prize Awarded

For the best paper submitted in the contest advanced by the American Water Works & Electric Company, Inc., controlling company of the Monongahela West Penn Public Service Company, H. F. Smiddy has won the first prize with his article "What Should My Company Mean to the Public?" Mr. Smiddy is assistant commercial manager of the West Penn Power Company. He receives five shares of the American Water Works & Electric Company's common stock. A second and third prize were also awarded. The Monongahela West Penn Public Service Company employees submitted 23 papers.

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Would Increase Rate on California Line

The San Francisco-Sacramento Railroad has applied to the California Railroad Commission for authority to increase its commutation rate $1.30 per month. Applicant has a contract with the Key System Transit Company whereby its passengers are carried between 40th and Shafter Streets, Oakland, and San Francisco by the Key System Transit Company and for which the applicant pays the Key System Transit Company the usual full commutation rate charged by that company. Due to the increase recently granted the Key System Transit Company the petitioner would be compelled to pay that company an additional $1.30 a month upon each joint commutation ticket sold, and as its deficit for the year 1927 was $122,793, it claims it cannot assume the additional burden.

Traction Referendum and Bus Lines Approved in Chicago

The voters of Chicago at a judicial election held on June 4 approved three public policy questions relating to the city's local transportation problems. Results of the vote are purely advisory and are not binding upon the administration. The questions were placed upon the ballot at the instance of the Amalgamated Improvement Association. Last month that body presented to the Board of Elections petitions for the referendum carrying more than 300,000 signatures.

The first question calling for a referendum on all transit legislation and ordinance was approved by a ratio of more than two to one. The question of whether the city should refuse to pass any ordinance other than one that would have for its purpose the use of the $50,000,000 traction fund in the building of downtown subways and another which would authorize the city to utilize the traction fund in providing municipal bus lines in outlying districts was approved by only a narrow margin.

New Plans for McKinley Bridge Approach

To meet objections of city aldermen and many residents of North St. Louis, the Illinois Traction System on June 4 agreed to modify its original plans for a subway, surface and elevated line connecting the McKinley Bridge with a new underground freight and passenger terminal at Twelfth Street and Lucas Avenue, St. Louis, so as to divert the surface lines to the river front north of North Market Street. This new proposal was made to the public utilities committee of the Board of Aldermen by H. I. Green, general attorney for the railway, and was later incorporated as a section of a proposed 50-year franchise for the company now pending before the aldermanic board.

The new plans will require the construction of a southern railroad approach to the McKinley Bridge at a cost of about $1,250,000. The new route would cost the company $1,500,000 more than the original plans, estimated to cost $5,000,000.

Governor Makes Requests of Massachusetts Legislature

Governor Fuller of Massachusetts sent a special message to the Legislature on June 12 requesting the appointment of a committee to draft legislation for the extension of transportation facilities in Boston and continued public control of the Boston Eleveated Railway. This is in line with the Governor's earlier assertion that he would keep the Legislature in session until it produced satisfactory legislation relative to the Elevated. He says he wants a subway in Governor Square to solve the traffic jams there and lower overhead, lower rental charges and lower dividend payments. The Governor claims it is meaningless to talk about private operation and futile to talk about public ownership at this time; but its the duty of this Legislature to solve the problem.

Riding Free in El Paso

Patrons of the El Paso Electric Company, El Paso, Tex., were invited to ride to town on the morning of May 28 between the hours of 8 and 10 a.m. as guests of the Popular Dry Goods Company. The invitation applied to any street car, any of the Pershing Line buses or any of the Lower Valley buses. The store did this to make it convenient for patrons to attend the opening of its 26th anniversary sale. Tickets were provided for the return trip.

The Keen Eye, the Discerning Instinct and the Convenient Waste Basket

PUBLICITY in modern business and industry is almost as vital as capital and labor, but along with the need for proper information in industry has come the greed or mania for unnecessary newspaper mention. This has made the handling of proper publicity difficult. The publicity man should send no story to the newspaper that does not render a service to the paper and that does not compete in interest with the material turned in by the newspapers' own reporters. Papers have only two sources of news—what they find and what is brought to them. From it all, they have to select the wheat from the chaff. And the modern editor has a keen eye, a discerning instinct and a most convenient waste basket. —*Hudson R. Biery of the Cincinnati Street Railway before the Cincinnati Electric Club on June 1.*

Detroit Municipal Said to Be Over Insured

Several millions of dollars' worth of insurance which it does not need is being carried by the Detroit Municipal Railway, Detroit, Mich., and thousands of dollars now expended annually in premiums could be used to make extensions and betterments to the system.

These are conclusions cited in a report submitted to G. Ogden Ellis, president of the street railway commission, by William M. Hauser. The system is carrying $15,600,000 in fire insurance alone, which amount could be reduced to $5,000,000 or less, according to the report. Of this sum $10,000,000 is carried in accordance with an agreement made with the Detroit United Railway at the time the city agreed to purchase the system. This was to protect the private company against loss in the event of fire destroying the property upon which the city was making semi-annual payments. The report states:

Two-thirds of the cost of Detroit Street Railway property acquired from the Detroit United Railways is equal to $13,233,332, so that the $10,000,000 of insurance placed as of May 15, 1922, would cover insurable property. But it should be borne in mind that payments have been made upon the Detroit United Railway property until Jan. 31, 1928, when there remained only $7,875,000 outstanding represented by bonds against the property; that is, all the interest the Detroit United Railway or the bondholders can have in the property so that the insurance could be materially reduced and at the same time meet the obligations of the contract. It might be reduced to approximately $5,000,000 or even lower.

Heavy insurance is carried upon such equipment as air compressors, engines, etc., upon which no insurance was carried when the property was privately owned. The report recommends that most of this insurance be eliminated.

All insurance of the municipally operated lines is handled by Rufus G. Lathrop, secretary to the commission. Some months ago the methods in vogue in handling insurance were questioned by agencies, and Mr. Ellis on Feb. 14 asked Mr. Hauser to report on the insurance carried. This report was presented to Mr. Ellis on March 9, but has not previously been made public. At that time Mr. Hauser was auditor of the municipal system.

"Skip Stop" in Columbus

Faster street car service, operated on the "skip stop" plan, was started for the first time on June 17 on the High Street and Cleveland Avenue lines of the Columbus Railway, Power & Light Company, Columbus, Ohio. Although the ordinance authorizing the company to increase its speed from 20 to 25 m.p.h. and requiring all traffic to come to a full stop before entering or crossing streets with car tracks became effective on June 13, officials of the company were not ready to place them in effect. It is understood that this service will be applied on other lines.

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Montreal Halfway Stops Abolished

Halfway tramway stops on both sides of St. Denis Street, Montreal, Canada, in certain double-length blocks were abolished on May 31 by the Montreal Tramways Commission to aid in speeding up the north end car service. The question of abolishing these stops has been before the tramways traffic experts for some time. No longer is it merely a question of speeding car traffic during the rush hours. The load practically all day on main thoroughfares is considered sufficient to require a service as fast as is possible.

Removal of Fifth Street Line, Kansas City, Opposed

A slight misunderstanding has arisen in connection with the new ordinance in Kansas City, under which the Kansas City Public Service Company is to operate buses for a six months' trial. According to a provision of the franchise, a new feeder line to be designated as No. 6 was to be started and a part of the Fifth Street car line was to be abandoned and the tracks removed. When the work of removing the tracks was begun residents protested and H. L. McElroy, city manager, ordered the work stopped.

Powell Groner, president of the Kansas City Public Service Company, said the plan to remove the tracks was explained to the Council when the company submitted the first suggestions for a revision of bus routes. At that time it was pointed out that rather than spend $77,000 to relay the tracks a bus line be installed to give service one-half mile beyond the end of the Fifth Street car line. No objection was raised then to the removal of the tracks. Mr. Groner said the district could not support both the bus line and the car line.

Service to America's Largest Airship Port

In the talk about air fields reached by electric railways Scott Field, at Belleville, Ill., served by the Illinois Power & Light Corporation must not be forgotten. It is America's largest airship port. It is owned and operated by Uncle Sam under the control of the chief of air corps of the United States Army, and plays a highly important part in the nation's aërial development program. The hangar at Scott Field is a huge, looming affair, built to house the largest present-day airships. The inside clear dimensions are 810 ft. in length, 150 ft. in width and 175 ft. in height. The outside dimensions are about 100 ft. greater. Translated into every-day terms, the hangar is three city blocks long and almost a city block in width and is as tall as a fifteen story office building. The ground floor covers an area of 5 acres. It would be possible to crowd the United States Army of 100,000 men into the building shoulder to shoulder and still have enough space left for a speaker's platform. The Illinois Power & Light Corporation furnishes electricity for all lighting equipment at Scott Field and for the operation of all machinery, including the hydrogen gas plant and the purifying plant for helium gas.

Useless Cars in Glens Falls Burned

More than 25 trolley cars, all from 30 to 37 years old, are being burned at the Queensbury carhouse of the Hudson Valley Railway, Glens Falls, N. Y., to make room for new buses which are to arrive on July 1. Wheels, motors, copper and brass are being salvaged. Some of the vehicles are those which replaced the old horse cars when the Glens Falls-Sandy Hill-Fort Edward street railway was electrified in 1890. Others are small belt-line cars which have been housed at Glens Falls since the Saratoga line was abandoned.

"The Martyrs" Sung in Cleveland

The first important public appearance of the male chorus of the Cleveland Railway, Cleveland, Ohio, dignified the Masonic auditorium on May 31 with "The Martyrs," an oratorio. Charles D. Dawe directed, and assisting artists were Helen Protheroe, William Simmons and Samuel Roberts. The company's male chorus was organized about a year ago and since that time has been heard over the radio and on the phonograph. Approximately 150 voices took part in an impressive rendition and the program was termed a very satisfactory one from the standpoint of performance and attendance.

In an introductory note in the printed program Col. Joseph H. Alexander, president of the company, explained that the creation of the male chorus was one example of the Cleveland Railway Company's policy to afford employees opportunity not only to carry on their duties with the company but to develop an avocation "which makes for better work and a happier environment."

Foreign News

Intercommunication System Improved in London

Eighteen tape recording machines are being installed by the London Underground Railways at its various offices, depots and the power station, in order to provide a method of giving details of failures and detentions quickly to those responsible for remedying them. The message transmitting system thus adopted is such as is used by newspaper offices, clubs, etc.

With the extensions to the London underground, heavier services, and increase in traffic density, the system of telephonic communication is said not to meet present-day requirements.

Six recording clocks were installed quite recently. The faces of these clocks are paper dials and are connected electrically with a contact lever on the track. Passage of a train makes an electrical contact which causes a small inked hammer to strike the fringe of the dial. The dial rotates at the equivalent speed of a clock and if the trains are running on schedule the markings on the dial will be spaced equally. The dial makes a complete revolution every 24 hours, thus giving a complete record for the day. However, it affords no explanation of what has occurred. The installation of the tape machines will overcome this difficulty.

Soudan Starts an Electric Railway

An electric railway has been built in Khartoum and Obdurman, adjoining communities at the junction of the Blue Nile and the White Nile Rivers in Soudan. The system comprises about 13 miles of narrow gage track (3 ft. 6 in.) with twelve single-truck motor cars and six trailers, besides a few cars for hauling freight. The property is owned by the Soudan Light & Power Company, Ltd., largely an English concern.

One-Man Locomotives Successful in Switzerland

During 1927 the Swiss Federal Railways equipped 30 electric locomotives with special devices to insure their safety with only one man in the cab, in this way saving wages of about 55 men. The results obtained have been so satisfactory that 30 additional locomotives of this type will be installed this year thus permitting additional economies in personnel.

Substitutions by British Tramways

Bills passed by a committee of the House of Lords, London, England, authorize the Greenock & Port Glasgow Tramways to substitute buses and the Nottinghamshire & Derbyshire Tramways buses and trackless trolleys. In both instances a certain amount of protection against competition was allowed.

Traffic in Berlin

The number of passengers carried on the street railways and rapid transit systems in Berlin, Germany, is constantly increasing. A comparison of passengers carried follows:

NUMBER OF PASSENGERS CARRED IN BERLIN (last 000 omitted)

	1927	1926	1925
Berlin surface lines.....	834,701	813,219	772,269
Underground and elevated	228,663	167,787	178,027

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Recent Bus Developments

Maine Commission Frowns on Substitution in Portland

The Maine Public Utilities Commission has ruled on the petition of the Cumberland Power Company, operating the railway system at Portland, Me., under lease, for permission to abandon parts of the system and to substitute bus service. In its finding the commission says in part:

While operating experience may show the expediency or the necessity of abandoning railway service previously rendered and the substitution of motor vehicles, reasons for such a course should be clear, decisive, unequivocal and reinforced by pertinent evidence.

When it is objected to by citizens accustomed to use the former method, a change such as that suggested in the present case requires the presentation to the commission of facts sufficiently reasonable to dispel any doubt of the commission's duty not to withhold such permission. The evidence in the present case falls short of meeting this standard of proof.

The need for the abandonment of the system these days when so many provide their own transportation by private automobiles may seem imperative, but the economic necessity for the change should be substantiated by evidence before the company resorts to substituted service in the heart of a populous and prosperous city as a means of meeting its public duties.

Sightseeing in El Paso

In a recent issue of the El Paso *Herald* readers took an imaginary trip to places of interest in El Paso and Juarez via a sightseeing bus operated by the El Paso Electric Company. The trip continued for 16 pages. The advertisement stated that it had probably never occurred to the residents of El Paso that they might enjoy a trip on the sightseeing bus quite as much as a visitor to El Paso would. The cost of the round trip is $1.50 for an adult and 75 cents for a child. Each day the sightseeing bus makes two trips. The operator explains in detail the interesting features at each stop and as he goes along.

P. R. T. Would Compete With Reading Company

Following the rejection by the Reading Company of its proposal for joint operation of buses to serve suburban riders, the Philadelphia Rapid Transit Company sought approval of the Public Service Commission on June 6 for a bus line from Broad Street and Olney Avenue north to Hatboro. Although operating officials of the Reading Company protested the application before Commissioner Benn on the ground that the competition would affect its own bus line between Jenkintown and New Hope, the Philadelphia Rapid Transit filed its proposed rate schedule showing a contemplated reduction of 14½ cents for the ride compared with the railroad's charge. The transit company plans to hook up the bus route with Broad Street subway for service into the central city.

F. D. Osterhout, passenger traffic manager of the Reading Company, told Commissioner Benn that approval of the Philadelphia Rapid Transit Company's petition might seriously affect the railroad's program for electrification of those suburban lines. He explained that the Reading issued 50 trip and 60 trip tickets which averaged 8 cents lower than the Philadelphia Rapid Transit Company fare charge. Mr. Osterhout added that the Reading Company made no profit from the tickets it sold providing for 50 or 60 trips as the buyer was disposed to choose. The commission withheld its decision.

Wisconsin Line to Use Buses

The Wisconsin Railroad Commission has granted the Wisconsin-Michigan Power Company, controlled by the North American Edison Company, permission to abandon the line through Appleton from Neenah to Kaukauna. Buses will supplant the cars. Permission was given because the company showed a loss of $174,563 in the last five years.

In 1911 the company was incorporated in Wisconsin as the Peninsular Power Company. The line was improved and extended in 1899 to Neenah and the line to Kaukauna was built in 1901. The present title was adopted in 1927.

The Waster

THE man who plans to park his car on a public street for most of the day may not be sensible to the consequent waste of valuable community space. In the enjoyment of what he considers a natural privilege he is apt to overlook the fact that it is a privilege. But he must see that he is wasting something of his own—he is wasting the time that he has to give to finding a convenient parking place, and he is exposing his valuable property to the weather all the time it might be safe in the garage.

"But I have a car," says he. "Why keep it at home?"

Yes, and he has a dress suit, perhaps. Why not wear that all day? Dress suits and top hats are desirable in one's wardrobe. So is an automobile in one's scheme of life. But a business suit and a derby give more all-round service. So does a street car. —*Ottawa Electric Railway News.*

New Service for New Jersey Shoppers in New York

A new de luxe bus line is being operated by the Public Service Railway between Erie Station, Rutherford, N. J., and the Capitol Theater Bus Terminal, Broadway and 50th Street, New York City. The line runs through the Holland Tunnel. It is known as the Rutherford-New York bus line route No. 152. *Whys and Other Whys,* the company pamphlet, says that theatergoers and shoppers will find this uptown service convenient for their trip into New York.

Connecticut-Rhode Island Line Approved

Authority has been given by the Connecticut Public Utilities Commission to the Groton & Stonington Traction Company to abandon railway service between Groton, Conn., and Westerly, R. I. The company is authorized to operate buses between the two points and has also been authorized to establish a new bus route between Groton and Groton Long Point during the summer months. The change is effective at once and service will start just as soon as schedules can be arranged and buses put into commission.

Effort to Advance Suit in New York City Frustrated

Supreme Court Justice Lydon has denied the application of counsel for the Manhattan Surface Coach Company, Inc., and the New York Railways to advance their suit against the city to change the minutes of the Board of Estimate meeting of July 28, 1927, for trial this month. This is one of the moves in the contest before the Transit Commission to stop issuance of certificates of convenience and necessity to the Equitable Coach Company which has already been awarded bus franchises for Manhattan, Brooklyn and Queens.

Operation in Santa Ana Defined

Permission has been granted by the California Railroad Commission to the Pacific Electric Railway to operate motor coach lines in the city of Santa Ana over prescribed routes. The company was also authorized to reduce the present 7-cent fare (four tickets for 25 cents) to a flat 5-cent fare, including transfer to and from applicant's rail lines within the local fare limits of Santa Ana.

New Service in Dallas

A permit has been granted to the Dallas Railway & Terminal Company to operate sightseeing buses in the city limits of Dallas. Each vehicle will have a capacity of sixteen persons. This is the first service of its kind to be operated in the city.

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Financial *and* Corporate

Amsterdam Line to Be Abandoned

A declaration of abandonment by the Fonda, Johnstown & Gloversville Railroad of the Vrooman Avenue line in Amsterdam, N. Y., covering a trackage of about 11,000 ft., was approved by the Public Service Commission on June 8. It was conditioned on the company's removing its rails and other structures from the various streets and putting the streets in serviceable condition. The city did not oppose the petition.

The Vrooman Avenue line abandonment was proposed in 1926 but was not made effective pending results of operation under an increase in fare which was allowed about that time. The evidence submitted on the recent abandonment hearing showed that there had been a continued falling off in revenue under the present fare charged in Amsterdam. The evidence also showed that 250,719 fewer passengers were carried on the Amsterdam city lines in 1927 than in 1926.

Rerouting Planned in St. Louis

The St. Louis Public Service Company, with the consent of the director of streets and sewers, has decided to reroute certain lines through the congested sections of St. Louis, Mo., in order to speed up traffic and eliminate bothersome curves. Proposed changes, according to estimates, will cost the company $200,000. The changed routing will become effective about Sept. 1. Ordinances providing for the new routes must be passed by the Board of Aldermen and signed by Mayor Miller. This will be done before the aldermanic board adjourns for its summer vacation.

Improvements Effected in Hamilton in 1927

In the 28th annual report of the Dominion Power & Transmission Company, for the year ended Dec. 31, 1927, W. E. Phin, president, states that most of the $1,109,064 expenditure under the classification of additions was made on account of the Hamilton Street Railway. In accordance with the terms of the agreement with the city, 90 per cent of this amount was contracted for and expended by the company in the city of Hamilton. The Dominion Power & Transmission Company controls and operates the Hamilton Street Railway, the Hamilton Radial Electric Railway, the Hamilton, Grimsby & Beamsville Electric Railway and the Brantford & Hamilton Electric Railway. The aggregate net profits of the company for the year were $649,629 against $654,220 for the year 1926.

New car shops and garage located in Hamilton were completed. During the year six new buses and 24 new cars were added to the railway service and twelve new cars were ordered. The construction of a new automatic substation in the West End was projected as an improvement to both the railway and lighting services.

In the report, mention is made of the service supplied by Hamilton Bus Company under a Provincial license between Hamilton and St. Catharine in competition with the Hamilton, Grimsby & Beamsville Electric Railway. Negotiations were conducted with that company and the purchase of its seven buses was effected.

According to the annual statement the company intends to seek an increase in fares on the Hamilton Street Railway and the Hamilton, Grimsby & Beamsville Electric Railway since both companies are operating at a loss.

$27,855 Available in Stockton for Charges and Dividends

The Stockton Electric Railroad operating in Stockton, Cal., reports to the Railroad Commission its 1927 operating revenue at $305,443, compared with $314,189 for 1926. Operating expenses, excluding taxes for 1927, are reported at $251,557, and at $262,232 for 1926, leaving net operating revenue of $53,886 for 1927, and $51,957 for 1926. During 1927 taxes charged to operation amounted to $21,101 and for 1926 to $21,867. Deducting the taxes leaves operating income of $32,785 for 1927, and $30,089 for 1926. Adding to the operating income, the non-operating income of the company and deducting non-collectible revenue and rents, results in a gross corporate income, which represents the amount available for interest, amortization of debt discount, other fixed charges, non-operating expenses, dividends and surplus, of $27,855 for 1927, and $24,959 for 1926.

New York State Railways Sold

New York Central Railroad disposes of holdings in New York State Railways and in Mohawk Valley Company. Railways will continue to be operated separately

ANNOUNCEMENTS were made in New York on June 13 by A. H. Harris, chairman of the executive committee of the New York Central Railroad, and by E. L. Phillips, president of the Empire Power Corporation and the Long Island Lighting Company, of the sale of New York Central's holdings in the Mohawk Valley Company and in the New York State Railways to Mr. Phillips and his associates, bringing under their control public utility properties with assets valued at nearly $227,500,000.

The statement of the New York Central chairman reported the sale of the railroad's holdings of 511,430 shares of Mohawk Valley Company stock to Mr. Phillips at $75 a share, conditioned on his making the same offer to other stockholders. The same arrangement also held for the sale of New York Central's holdings of 136,043 shares of New York State Railways common stock at $25 a share. These prices represent a total of $41,758,325 accruing to the railroad from this transaction, which is reported to have been made in cash.

Mr. Phillips announced that the minority stockholders of the acquired companies have the privilege of accepting the same terms as applied to the railroad, or of receiving securities in a new company to be formed in exchange for their present holdings. On the basis of the cash offer, the total deal would represent an outlay of $61,238,100 for the outstanding Mohawk Valley capital stock and New York State Railways common stock.

The new company to be organized by the Phillips interests will take over the Mohawk Valley properties and contiguous properties already owned by the Empire Power Company, bringing into a single organization electric and gas properties in New York State having an aggregate value in excess of $150,000,000.

Associated with Mr. Phillips in this transaction were the Jonas interests, represented by the Manufacturers Trust Company, and W. C. Langley & Company, New York, long interested in the financing of light and power companies. The terms of the offering made to the minority stockholders of the acquired companies will be mailed on or before July 1.

The New York State Railways will continue to be operated separately. The company owns 465 miles and leases 131 miles of trolley lines, supplemented by bus services at numerous points. The system comprises the city lines in Rochester, Syracuse, Oneida and Utica, and suburban lines to numerous resorts. It owns 88.3 per cent of the Rochester Electric Railway capital stock.

Assets of New York State Railways totaled nearly $59,800,000 at the close of 1926. There is $19,997,700 authorized and $19,952,400 outstanding $100 par common stock, of which New York Central owned $13,604,300, and $3,862,500 authorized and outstanding 5 per cent cumulative $100 par preferred stock. The funded debt is about $26,500,000.

The Mohawk Valley Company had assets of about $12,500,000 at the end of 1926 and had 750,000 authorized and outstanding shares of no par capital stock, of which New York Central owned 511,430 shores. There is no funded debt. The company owns all the common stock of the Rochester Gas

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& Electric Corporation, which had assets of $60,600,000 at the end of 1926, with a funded debt of $23,499,500. The latter corporation has 756,070 outstanding no par common shares of an authorized issue of 825,000 shares and $18,530,300 preferred stock of three series, out of $30,000,000 authorized.

Some Other Affiliated Companies

The Empire Power Corporation controls the New York Central Electric Corporation with assets of $12,250,000, which in turn controls the Empire Gas & Electric Company, with assets of $12,500,000, the Seneca Power Corporation, a $1,700,000 property, and the United Gas & Electric Corporation, valued at $24,750,000 on the books at the close of 1926.

The Long Island Lighting Company, with assets of $35,500,000, controls six other Long Island properties valued at $40,700,000. This was the first organization developed by Mr. Phillips in his quarter century of experience as a public utility operator. The Long Island properties are expected to continue as a separate organization. Elsewhere in this issue the career of Mr. Phillips in the utility field is reviewed.

Receiver Named for Buffalo & Erie Railway

Supreme Court Justice Thomas H. Noonan on June 8 ordered the Buffalo & Erie Railway into a receivership after a judgment for $382,126 was filed against it.

Application for the receivership was made by the Internation Utilities Corporation, New York. George MacLeod, Dunkirk, general manager of the railway, was named receiver.

Charles M. Blair, attorney for the railway, said the action was a friendly one designed to protect and conserve assets of the corporation.

The company operates from Buffalo, N. Y., to Erie, Pa. It was in the hands of a receiver from 1915 to 1925, when the International Corporation refinanced it.

Reorganization Plan of Detroit United Operative

Reorganization plans of the Detroit United Railway, Detroit, Mich., dated April 1, have been declared operative, as a result of the depositing of more than 80 per cent of certain securities. The deposits include outstanding mortgage and collateral trust sinking fund five-year 6 per cent bonds of Detroit United Railway and first mortgage bonds of the Detroit, Monroe & Toledo Short Line Railway. The time limit within which holders of certificates of deposit for bonds of the Detroit United Railway may exercise the right of subscription to the syndicate has been advanced to June 29. The terms of the reorganization were reviewed at length in the issue of the Electric Railway Journal for May 5, page 754.

Corporate Simplification in Philadelphia

Another attempt being made to arrange for the elimination of subsidiaries. Last year's survey resulted in recommendation that city pay $36,000,000 to surrender rights

HEARINGS are about to begin before the Public Service Commission of Pennsylvania at which the effort will be made to bring together all sides in an amicable agreement on the question of the disposition of the underlying companies of the Philadelphia Rapid Transit Company. While the matter has been agitated before, the present is the first really definite attempt to condemn the franchises of nearly forty so-called underlying companies and give the City Administration power to dictate future transit policy without encountering obstacles inherited from politicians of pre-Civil War days. In substance the question is:

What is a fair price for the city to pay in return for the property now held under 999-year franchise by the underlying companies?

An Inheritance from Horse-Car Days

These companies originated in the days when local transit matters were in the hands of the State Legislature. Whenever a group of Philadelphians decided to operate a string of horse cars, it obtained from the Legislature a charter permitting it to lay tracks on certain streets, establish a fare and start business.

Finally conditions reached the point where a gradual consolidation became desirable to gain riders and save fares, with most of the franchises of these original companies being leased to three larger concerns. Finally in 1895 the Union Traction Company was organized to gain control of all of the lines, and it in turn later leased its holdings to the Philadelphia Rapid Transit Company, the present operating concern.

Some of the tracks have disappeared altogether, leaving nothing except a franchise to show that lines ever were operated on the deserted streets. Yet through contracts that apparently are iron-clad, holders of securities in the underlying companies have continued to split a sum of $8,500,000 paid annually by the Philadelphia Rapid Transit Company as rental charges for operating privileges. Most of the underliers are leased on a rental of 6 per cent on their capital stock.

Now, when in the process of city planning a move is made to eliminate further car lines, as was the case last year when the Pennsylvania Railroad wanted to begin work on its $62,000,000 beautification program, it is necessary to gain the consent of from two to seven distinct boards of directors, owing to ramifications in the transit structure. In this particular case, tracks were removed from five blocks of Filbert Street. The process was this:

Permission had to be obtained from the Philadelphia Rapid Transit Company's directorate. It, however, had leased the lines from the Union Traction Company, whose directors then had to be consulted. This company had leased the line from the Philadelphia Traction Company, which in turn was guaranteeing rental charges to the Union Passenger Railway, which in its turn was making a similar guarantee to the Continental Passenger Railway, holder of the surface rights on Filbert Street under a charter obtained in 1873.

Opponents of the condemnation scheme habitually refer to the old franchises as "dead horse" and ask what the city will have to show for the money it spends in buying them. Proponents of the plan offer the always attractive argument of a prospective lower fare, a net saving to the city over a term of years and ultimate freedom from the bothersome tangle of perpetual charters and bewildering series of leases.

"Protection committees" have been appointed by the principal underlying companies to prepare the financial demands of some 18,000 stockholders. Lawyers for the underliers declare that the "innocent investors" in the stocks and bonds of these companies must be protected.

In many instances, trust funds totaling millions of dollars are made up largely of underliers' securities, and the biggest trust companies in the city are interested in the fight. Three or four years ago, these companies themselves took the initiative in what was to have been a reorganization of the whole transit financial structure. A plan prepared by Joseph Gilfillan, counsel for the Union Traction Company, was shelved at that time, however, when certain influential persons appeared adamant to the project.

Based on the McChord Survey

The present movement is based largely upon a survey made last year for the Public Service Commission by Charles C. McChord, former chairman of the Interstate Commerce Commission. He recommended that the city pay the underliers $36,000,000 to surrender their rights.

In Mayor Mackey's opinion, a solution of this kind would mean that "carrying charges on the city bonds used for the purchase would, with the savings in taxes thus brought about, be $4,500,000 less than the rentals now paid by P.R.T. to the underliers."

Opponents are equally firm in their belief that money spent for the old franchises would be squandered.

St. Louis Official Made Director

Sam W. Greenland, vice-president and general manager of the St. Louis Public Service Company, St. Louis, Mo., was elected to the board of directors of the company on June 5.

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Net Income $707,454

Capital Traction reports falling off in net and traffic. Bus lines show improvements. Statistics of operation interesting

THE number of passengers carried in 1927 by the Capital Traction Company, Washington, D. C., showed a greater decrease than during either of the two preceding years, and the net earnings from operation were less than in either of those two years. While the net income for 1927 was not equal to the amount required for the 7 per cent dividend on stock, the directors considered it entirely proper to continue the dividend disbursement at that rate, making up the deficiency from undistributed profits of former years. These facts were contained in the annual report of the board of directors to the stockholders.

Net additions to capital account were $204,893. Of this amount, $63,963 was expended for bus line plant and equipment.

No change was made during the year in the basis for accruing depreciation. The total amount accrued through operating expenses in 1927 was $365,334, and on Dec. 31 the reserve for depreciation was $3,019,086.

On Feb. 7 the Court of Appeals of the District of Columbia rendered its decision on an appeal of the commission and fixed the value for rate-making purposes as of Jan. 1, 1925, at $25,765,880.

Tax accruals for the year were $370,289, a decrease of $29,361 from the preceding year. This decrease was due to the abolishment by Congress of the Capital stock tax, and to a decrease in gross receipts and federal income taxes on account of decreased gross and net earnings, offset by increases in real estate and special crossing police taxes.

The Employees Relief Association membership includes 982 out of a total of 1,261 employees. After paying sick and death benefits and all other expenses, the year's operation showed a profit of $2.69 per member. A Christmas Savings Club was again maintained and in December the amount disbursed to members, including deposits and interest, was $53,459.

All bus lines which were operated throughout the year showed material improvement. The net loss on bus operations for 1927 amounted to $29,790, or $33,081 less than the loss during the preceding year. Three new bus lines were opened during the year.

During the year 2.128 miles of track were replaced with modern construction. Of this, 0.632 mile was track jointly owned with the Washington Railway & Electric Company.

Seven street car type buses were purchased in 1927 to replace an equal number of the same type buses retired from service, and four additional parlor-car type buses were purchased and placed in service. Full provision for depreciation had been made on the buses retired.

In accordance with the authority granted to the directors at the annual meeting of the stockholders held in January, 1927, negotiations were concluded in July for the purchase for $98,000 of all outstanding securities of the Washington & Maryland Railway, the actual transfer being made as of July. Subsequent to the purchase of these securities an agreement was made covering the operation of the lines of the Washington & Maryland Railway, which still retains its corporate identity.

SUMMARY OF OPERATIONS OF THE CAPITAL TRACTION COMPANY FOR YEAR ENDING DEC. 31, 1927

			Change Over 1926
Passenger revenue, railway		$4,220,017	*$195,301*
Passenger revenue, bus		210,759	36,128
Special car revenue		21	*27*
Special bus revenue		10,838	7,015
Total revenue from transportation		$4,441,636	*$152,184*
Revenue from operations other than transportation		37,463	14,297
Gross operating revenue		$4,479,099	*$137,886*
Operating expenses (68.5 per cent of gross revenue)		3,099,573	*574*
Net operating revenue		$1,379,525	*$137,312*
Taxes assignable to transportation operations		370,289	*29,361*
Operating income		$1,009,235	*$107,935*
Non-operating income		43,032	11,947
Gross income		$1,052,268	*$96,002*
DEDUCTIONS FROM GROSS INCOME			
Interest on funded debt	$280,300		
Interest on unfunded debt	52,182		
Rent for leased road	8,074		
Income tax paid at source	4,257		
Total deductions		$344,814	*$594*
Net income		$707,454	*$95,408*
PROFIT AND LOSS STATEMENT			
Credits:			
Balance at beginning of year	$1,410,641		
Net income for the year	707,454		
Profit from sale of Federal Farm Loan Bonds	67		
		$2,118,163	
Debits:			
Dividends	$840,000		
Appropriation for injuries and damages reserve	50,000		
Additional Federal income taxes, 1918, 1919	809		
Cancellation of account receivable	50		
		890,859	
Credit balance at close of year		$1,227,303	*$183,338*

Italics denotes decrease.

REVENUE AND TRANSFER PASSENGERS OF CAPITAL TRACTION COMPANY

Railway passengers:	1927	1926
Number of passengers carried at 8 cents	17,543,570	17,719,054
Number of passengers carried at 6⅔ cents	40,376,123	43,128,140
Number of passengers carried at 5 cents	758,666	830,780
Number of passengers carried at 3 cents	369,397	383,007
Number of cash passengers carried on Kensington Line	104,221	110,896
Number of ticket passengers carried on Kensington Line	41,004	46,130
Total railway revenue passengers	59,192,981	62,218,007
Bus passengers:		
Number of passengers carried at 25 cents	428,111	343,899
Number of passengers carried at 10 cents	65,015	64,814
Number of passengers carried at 8 cents	342,866	310,085
Number of passengers carried at 6⅔ cents	562,025	528,022
Number of passengers carried at 5 cents	206,301	60,511
Total bus revenue passengers	1,604,318	1,307,331
Total revenue passengers railway and bus	60,797,299	63,525,338
Other passengers:		
1 cent inter-company transfer passengers	2,888,278	2,814,693
2 cent bus to car transfer passengers	675,693	556,225
2 cent car to bus transfer passengers	417,735	374,550
2 cent Eastern High School ticket passengers	459	8
Free transfer passengers	16,301,004	16,982,373
Other free passengers:		
Employees	696,508	709,610
Policemen and firemen	*46,374	52,295
Total passengers	81,823,350	85,015,092

* Exclusive of policemen and firemen riding free while in uniform.

COMPARATIVE STATEMENT—DEPRECIATION RESERVE OF CAPITAL TRACTION COMPANY

	1927	1926
Balance in reserve at close of preceding year	$2,716,657	$2,458,454
Accruals for the year	365,334	361,934
Interest received during the year	98,853	90,140
Total	$3,180,845	$2,910,530
Less—Expenditures during the year	161,759	193,872
Balance at close of year	$3,019,086	$2,716,657

CAR AND BUS MILES OF THE CAPITAL TRACTION COMPANY

	1927	1926	1925
Car-miles, city lines	7,409,753	7,630,890	7,723,259
Car-miles, Chevy Chase line	1,012,382	992,109	983,687
Car-miles, Washington and Maryland line	175,898	193,965	189,998
Car-miles, Kensington line	69,961	69,951	69,842
Total car-miles	8,667,994	8,886,915	8,966,786
Bus-miles	1,084,992	968,454	601,102
Total car and bus miles	9,752,986	9,855,369	9,567,888

EXPENDITURES ON ACCOUNT OF ROAD AND EQUIPMENT OF CAPITAL TRACTION COMPANY DURING 1927

Carhouse building additions	$30,331
Shop building additions	4,561
Track and line betterments	93,540
Car betterments	5,899
Buses and bus service equipment	59,301
Bus garage additions	4,661
Miscellaneous	7,705
	$206,002
Credit—Power Station equipment retired	1,108
	$204,893

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Sale of Geneva Road Planned

The way is believed to have been cleared for the sale of the property of the Geneva, Seneca Falls & Auburn Railroad, Geneva, N. Y., under foreclosure on June 20, particularly since a compromise settlement of paving assessments and taxes has been effected between the Common Council and the railroad. The city accepts $500, to be paid within thirty days, in full settlement of $25,466 owed for city paving and $27,861.81 of taxes. At the meeting at which the settlement was arranged Attorney Lansing G. Hoskins and Receivers James M. Ryon and Lansing S. Hoskins, representing the railway, explained that efforts to sell the property have failed because none would assume the burden of $72,345 that the line owed the municipalities of Geneva, Waterloo and Seneca Falls.

The failure of city buses to operate was explained in a letter from officers of the Geneva Railway Bus Lines, which set forth that companies carrying insurance cancelled policies for non-payment of premium, and that the road could not operate without insurance under its franchise.

Operation Discontinued in Lincoln

The Lincoln Municipal Street Railway discontinued operation of its line in Lincoln, Ill., on May 15 and the City Council now contemplates selling the line and equipment. For several years the line has been operated by the Illinois Public Utility Company under lease at $1 a year. Recently that company asked the Council for permission to stop operation. C. E. Steinfort, manager, told the Council that the line had been losing money constantly. The line was 5 miles long.

Decision on Indiana Merger Awaited

A compromise basis for exchange of securities, announced by Halsey, Stuart & Company, indicates that the proposed merger of the Terre Haute, Indianapolis & Eastern Traction Company and the Central Indiana Power Company, under the title of the Indiana Electric Corporation, either is to be declared operative or entirely abandoned soon after July 1. It is believed the exchange plan will be acceptable because it was proposed by committees of affected bondholders and stockholders and that the merger will be consummated. The compromise proposal states that holders of the first mortgage bonds of three companies—Indianapolis & Northwestern Traction Company, Indianapolis & Martinsville Rapid Transit Company and Indianapolis, Crawfordsville & Danville Electric Railway—are to receive one share of Indiana Electric Corporation preferred stock, series A, for each $100 principal amount of bonds; that holders of the 5 per cent cumulative preferred stock of two companies—Indianapolis & Northwestern Traction Company and Indianapolis, Crawfordsville & Danville Electric Railway—are to receive Indiana Electric Corporation preferred stock, series B, on a par for par basis.

In a letter submitting the compromise, the Chicago firm said that after the expiration of the twenty-day withdrawal period, the manager will check the securities then on deposit under the plan and agreement as amended or shall otherwise have assented thereto, to determine whether in each case they are sufficient to declare the plan operative.

Traffic Increase in Tennessee

Transportation earnings of the Tennessee Electric Power Company, Chattanooga, Tenn., covering the operations of the Nashville Railway & Light Company were $3,314,225 in 1927, compared with $3,284,487 in 1926. Approximately 26 per cent of the gross earnings was derived from the transportation business. The number of revenue passengers carried on the system during 1927 was 45,621,217, or approximately the same as in 1926. Figures showing the revenue passengers carried were contained in the annual report of the board of directors to the stockholders. For the past five years the figures are as follows:

Calendar Years	Revenue Passengers Carried
1923	45,929,865
1924	45,057,283
1925	45,489,991
1926	45,615,025
1927	45,621,217

About 13 per cent of the capital expenditures in 1927 was used in the transportation department. In that department considerable track and roadway construction was undertaken on various streets in Nashville and Chattanooga and improvements were made to rolling stock and equipment.

Report of New York Railways

The New York Railways, operating 75 miles of underground conduit surface lines in the Borough of Manhattan, reports earnings for the year ended Dec. 31, 1927, compared with the year 1926:

	1927	1926
5 cent cash fares	$6,252,640	$6,506,229
2 cent revenue transfers	138,514	157,916
Other transfer fares	1,086	1,269
Total	$6,392,240	$6,655,415
Other operating revenues	515,679	523,317
Total operating revenues	$6,907,920	$7,188,732
Total operating expenses	5,421,255	5,473,058
Taxes	478,191	515,065
Operating income	$1,008,475	$1,200,609
Non-operating income	102,923	69,096
Gross income	$1,111,398	$1,269,705
Interest on funded debt	268,010	231,354
Controlled companies, account operation	501,513	506,060
Other deductions	213,089	174,924
Net income available for other charges	*$128,785	*$357,368

*Excludes accumulated and unpaid interest on income bonds which interest has not been declared due and payable and claims of minority stockholdings in controlled companies, if any.

Discontinuance on One Long Beach Line

The Pacific Electric Railway has been authorized by the California Railroad Commission to discontinue passenger service on its Magnolia Avenue line in the City of Long Beach. Removal of the tracks is also authorized.

Loss on Salt Lake & Utah

The Salt Lake & Utah Railroad, Salt Lake City, Utah, finished the year 1927 with a deficit of $231,102. In the report filed by the company the great decrease in revenues and heavy interest and taxes were cited as the cause of this condition. Operating revenues in 1927 were $638,289, which was $92,841 less than the amount received in 1926. Expenses were $623,723, or $16,627 more than in 1926. The total corporate surplus of the company showed a deficit of $428,895 at the close of 1927.

Net Loss of $171,853 in Portland

In the report of the Cumberland County Power & Light Company for the fiscal year ended Dec. 31, 1927, it is stated that operation of the leased railroad, the Portland Railroad, Portland, Me., showed a continuing decrease in gross receipts and an increase in the net deficit. Reference is made to the intention of the company to petition the commission for authority to discontinue some portions of the railroad mileage which yielded revenue far below the cost of service. Where practicable, the company will, if approved by the commission, provide bus service to former railway territory.

The report of the Portland Railroad follows:

INCOME ACCOUNT FOR THE YEAR ENDED DEC. 31, 1927, FOR THE PROPERTY LEASED FROM PORTLAND RAILROAD

Gross earnings	$1,296,423
Operating expenses, maintenance and taxes (including retirement appropriation $120,600)	1,120,729
Net earnings	$175,694
Rent for leased properties	263,548
Gross income (deficit)	$87,853
Deduction from gross income: Bond and other interest charges	84,000
Net loss for the year	$171,853

San Jose Railroads Report

The San Jose Railroads, operating in San Jose, Cal., reports to the Railroad Commission its 1927 operating revenue at $366,881 compared with $385,545 for 1926. Operating expenses, excluding taxes for 1927, are reported at $306,613, and at $348,034 for 1926, leaving a net operating revenue of $60,267 for 1927 and $37,511 for 1926. During 1927 taxes charged to operation amounted to $29,943, and for 1926 to $25,265. Adding to the operating income the non-operating income of the company and deducting non-collectible revenue and rents, results in a gross corporate income of $36,785 for 1927, and $13,749 for 1926.

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Personal Items

E. L. Phillips

Engineer who has worked unobtrusively for years arranges to take over Rochester, Syracuse and Utica trolleys from New York Central Railroad

FINANCIAL engineer. That is the term which fits best E. L. Phillips, announced on June 13 as having arranged on behalf of himself and associates to take over the Mohawk Valley Company and the New York State Railways operating in Rochester, Syracuse, Utica and other cities from the New York Central Railroad at prices estimated to involve more than $40,000,000.

It is a territory not new to Mr. Phillips, this one in Central New York, since there as a young engineer he helped to construct some of the roads of which he now becomes the owner. More recently he has had a hand in the growth of Central New York communities through the Empire Power Corporation and the United Gas & Electric Corporation, both of which he serves as an officer.

About Mr. Phillips the usual books of biographical reference were mute. Corporation manuals listed his name in a string of companies, but other than these facts and that he was the head of the engineering firm of E. L. Phillips & Company, New York, there appeared at first not to be much to garner. But E. L. Phillips & Company is not a new concern. It was founded by Mr. Phillips about 25 years ago. That means the company was started shortly after the potentialities of the light and power business had first come to be realized. And few men had a keener realization of these potentialities than did Mr. Phillips.

Not so long before the founding of the firm he had been graduated from Cornell as an electrical and mechanical engineer. It was practical experience that the young engineer wanted, and this he obtained in turn with the Sprague Electric Company, the Otis, the de Laval and the telephone companies. But that wasn't enough. Westinghouse, Church, Kerr & Company were at that time installing plants in all parts of the country and so Mr. Phillips joined their forces as an engineer. The record of that company, if it were written, would be largely the record of the country in certain kinds of engineering and development work, and in that work Mr. Phillips participated actively.

As has been indicated before, there stands to his credit no small part of the engineering work done on certain roads in New York State and in the Central West. And among the roads best known at that time in the construction of which Mr. Phillips played a large part was the Detroit, Ypsilanti & Ann Arbor road, projected originally to be built through to Chicago, but later becoming a part of the Detroit United System.

Meanwhile came the formation of E. L. Phillips & Company, a desire Mr. Phillips had nurtured for some time. And following the founding of the new company gradually came the entrance of Mr. Phillips into the financial side of the light and power industry. At first construction and engineering was the aim of the company, but it was only a step from that into management and

E. L. Phillips

finance. And so becomes logical the list of offices which Mr. Phillips now fills, notable among them that of chairman of the board of the United Gas & Electric Corporation, controlling a score or more of utilities throughout the country, some of them in the very territory where operate the companies into which Mr. Phillips and associates have now arranged to buy.

If there is any company with which Mr. Phillips is identified in which he takes a special interest it is the Long Island Lighting Company. That company, with a few exceptions, now does the entire lighting and power business on Long Island east of the line which marks the boundary of Greater New York. Mr. Phillips was quick to see the future there. His start on Long Island was made in the acquisition of several small properties, but it was not long before he and his associates, by one acquisition after another, had evolved the present well-ordered and ably-managed Long Island Lighting Company. Other so-called Phillips interests on Long Island are the Kings County Lighting Company, operating in south Brooklyn and Coney Island, and the Queens Borough Gas & Electric Company, which should not be confused with the New York & Queens County Electric Company, a New York & Edison Company interest. In addition a Phillips interest is the New York Central Electric Company, operating in Auburn, Geneva, Hornell and about twenty other places in central New York. This in part is the record of the man who is the principal figure in this $40,000,000 deal announced on June 13.

C. F. McAuliff Honored by Purchasing Agents

C. F. McAuliff, purchasing agent and assistant to the vice-president in charge of operation of the Texas Electric Railway, Dallas, Tex., was elected vice-president of the National Association of Purchasing Agents at the thirteenth annual convention of the association, held in Kansas City May 28-31. He has been with the Texas Electric Railway for the past fifteen years.

Mr. McAuliff's first railroad experience was with the New York Central in the maintenance of way department. He went to Texas when the interurban line from Dallas to Waco and the line from Dallas to Corsicana were being constructed. He was born in Peekskill, N. Y., in 1892. He attended public school and Worrall Hall Military Academy.

Obituary

Frank J. Linforth, assistant to the general manager of the Market Street Railway, San Francisco, Cal., and editor since 1922 of *Inside Track*, the company's employee magazine, died recently. He entered the employ of the Market Street Railway as a conductor in September, 1908. Later he served as night clerk and was in succession day clerk, investigator and inspector of applicants in the employment department. In July, 1923, he was appointed superintendent of employment and training. It was said that much of the success of the company's personnel policies was attributed to Mr. Linforth's close application to the solution of employment problems.

Before going to the Market Street Railway Mr. Linforth had been a captain of constabulary in the Philippine Islands. He was educated at Notre Dame University. He was one of the original contributing editors to *Byllesby Management*.

JOSEPH GARFIELD ROBERTSON, formerly in charge of signal operations for the Connecticut Company, Hartford, Conn., died on May 14. Mr. Robertson left the Connecticut Company about two years ago to supervise installations on the Shore Line in Guilford, Conn. He was 47 years old.

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Manufactures *and the* Markets

Good Outlook for Second Half of Year

The outlook for the second half of 1928 is for a continuance of the generally good business which has obtained during the first period of the year, according to the Harvard Economic Bureau. A seasonal decline is in prospect, of course, though the recent strength in commodity markets suggests that the periodic curtailment of manufacturing output will be moderate. Later there may be political developments which will slow down the autumn expansion, although nothing definite can be known this early in the year. But this influence, like the seasonal influence, operates at the present time on the side of business conservatism, fundamentally a healthy condition. The spring expansion of manufacturing output has been moderate, and commercial credits appear to be liquid. Already commercial borrowings are below the spring peak.

Uniformity of trends in leading industries cannot be anticipated during the next several months. However, taking a broad view of the industrial situation, the Standard Statistics and Securities Service believe that the mere term prospect is generally more favorable than at this season in the past several years. Not only will the seasonal letdown this summer be comparatively moderate, but there is sound basis for the belief that an excellent seasonal recovery will occur during the fall.

The National City Bank reports that never before has business been so solidly intrenched in cash and so unencumbered with inventory. A few over-extended spots can be found, as always, but nothing which in the event of liquidation would cause more than a local disturbance.

Banking and Credit Conference Held

One hundred economists, bankers, manufacturers and representatives of farm and labor organizations met on June 4 in Washington, D. C., under the auspices of the Chamber of Commerce of the United States to consider questions in relation to the country's banking and credit machinery.

The discussion of the conference centered upon the tentative report of a special committee which for the past year has been making a study of banking and credit problems. The object of this committee is to make recommendations looking to possible improvements to meet changing conditions of all classes of business and industrial activity.

In addition to the main report of the committee, dealing principally with the federal reserve system, the conference had before it auxiliary reports on "Better Banking Under the Federal Reserve System," "Rediscount Operations of the Federal Banks," "Open Market Operations of the Reserve Banks," "Guides to Reserve Credit Policy," "Structure and Control of Federal Reserve System," "Reserve Requirements for Reserve and Member Banks," "Federal Reserve Notes and Other Currency," and "Membership of the Reserve System."

The purpose of the conference is to bring to a focus upon these questions the widest and most representative opinion, preliminary to the drafting of the final reports of the committee to be made later in the year.

South Shore Improvements to Continue

An addition of 3,300 ft. of double track in Gary, Ind., will be in operation on the South Shore Line with completion of the increased Virginia Street siding, east of Gary station, in the next two months.

Grading for this new improvement, which will extend the present siding eastward from Virginia Street, is already finished, and the installation of the materials including 100-lb. rail, creosoted ties, and plates will soon be started.

The Virginia Street track will be the third rail-laying work to be undertaken this season by the South Shore Line. Ten and one-half miles of new 100-lb. rail, and a 4,200-ft., high-speed siding signal-protected, are the other two jobs, both being nearly completed.

Far Sighted Purchasers Invite Proper Price

MANY are prepared to accept as a settled conviction the principle that the continued prosperity of one rests on the success of many; that whenever a business man serves well an industry of which his particular enterprise is a part, in the long run he will serve his enterprise most. Conversely, any action he takes contrary to the general welfare reacts upon him to his distinct and usually greater disadvantage. In an address by W. W. Nichols before the Purchasing Agents Association, he brought out that in accepting this principle, one that was laid down by him, the conclusion follows that the success of the vendor is distinctly the concern of the purchaser and the success of the vendor is of greatest consequence to the ultimate success of the purchaser. So little thought is given to this on the part of the purchaser that many times he applies unintentional, perhaps, though none the less active, opposition to the vendor's efforts to supply the requirements demanded of him; too many purchasing agents defeat their ends by giving too exclusive attention to a factor which, in the common estimate, crowns their transaction, viz., *Price;* "too exclusive" because it belittles their consideration and warps their judgment as to the merits of other factors, which are often of greater importance.

For several years the heavy machinery industry has given heed to a costly impropriety incurred in furnishing the working drawings required with the proposals which purchasing agents invite. Unquestionably this practice was originally prompted by an occasional and recognized necessity, but the purchasing agent and his engineer, the *real* instigator, have taken an unfair advantage of an opportunity, to create many abuses in this particular. Cribbing legally protected information, a ruthless disregard of patent and other rights became so offensive as to have invited the consideration of our national asssociations of engineers and others until there has risen a conscientious opinion, with a reference to certain ethical claims, formerly *never* in evidence.

Other instances of like character can be offered to prove how an action, originally harmless in intent, can easily lead to insincere, unfair and dishonorable practices, *prompted in the individual as opposed to the public interest,* with a marked tendency to a moral obliquity sadly demoralizing to good business practices.

None will deny that the manufacturer is entitled to a proper return on his investment of brains and money. Needless price cutting, which too frequently constitutes the purchasing agent's one aim, cannot but work to the positive disadvantage, sooner or later, of his own interests. When a purchasing agent conspires and, by questionable tactics,

Exhibitograph No. 12

IF
You Have Never
Exhibited Before
Don't
Miss Doing So This Year
at the
A.E.R.A. Show
IT
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Biggest and Best Ever
Cleveland, Ohio
Sept. 22 to 28 inclusive

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pits one bidder against another until the low price in the first instance has been cut even to less than cost, he unwittingly inflects on his own company the resulting effect, in more senses than one.

The vendor who accepts orders which sustain losses can only stay in business by carrying these losses to future orders. He does this, of course, by increasing his overhead charges, which will be unavoidably included in his future estimates. If he is not accorded the profits his enterprise requires, he cannot advance, for after paying the necessary returns on his investment, he will have too little left for that progress in engineering, improvement in design and effectiveness the purchaser's own particular success requires.

Within the year the General Motors Corporation, confronted with proof that a contemplated purchase of certain raw material, at the price bitter competition induced, threatened the existence of the industry supplying it, voluntarily allocated its orders at an advance over quoted prices, in order to preserve an industry in which it had a vital concern. In this way, and only in its own protection, did General Motors make it possible for another industry to manufacture profitably, and thus gave recognition to an economic principle: short-sighted purchasing policies, focused solely on the gains of the moment, never insure lasting benefits.

We need the firm and compelling conviction, particularly in business, that, as it has been truly said, "Whatever is economically sound is ethically sound, and whatever is ethically unsound is economically unsound." Much trouble can be chargeable to one's willingness to do that for his business connection he would not think of doing for himself.

The chief need of the executive in every department of business is a high moral understanding—an instinct, with the moral courage to follow its dictates. This exists to day to a greater degree than twenty years ago. It is not difficult to believe that our business stability and its success can be attributed largely to this marked improvement in business conduct with a more settled and sensible reference to the Golden Rule of business. Integrity in business means much more now than formerly. Very properly the buyer requires honest values. Why should he not strive to give correspondingly honest prices?

Substitution Suggested for Part of Pennsylvnia Line

The Southern Pennsylvania Traction Company, Chester, Pa., has applied to the Public Service Commission for permission to remove its tracks between Media and Glen Riddle and substitute buses for cars between those points. P. T. Reilly, manager of the company's railway department, has informed Commissioner Benn that it would cost $54,638 to keep the railway in operating condition during the next two or three years. The application was not opposed.

Changes in Harvard Advertising Awards Announced

Announcements of provisions of the Harvard Advertising Awards of 1928 are now being mailed. Campaign awards of $2,000 each will be made as follows:

1. For a national campaign of a specific product.
2. For a local campaign for a specific product or merchandise.
3. For a general or institutional campaign.
4. For a campaign of industrial products.

In submitting material a brief will not be required, nor should the advertisements be mounted. A statement of 600 words giving pertinent facts concerning the campaign is the only necessary material to accompany advertisements themselves.

Among the individual awards, a new prize of $1,000 will be offered this year for the advertisement most effective in its use of display line. In addition there will be the prizes for the most effective use of text, of pictorial illustration, and of typography. The award for the best combination use of text and illustration has been discontinued.

The award for the best advertising research has also been discontinued, because of the belief of the Harvard authorities that this award had not been a stimulus for more effective research work.

The gold medal for distinguished service to advertising is again included among the awards to be offered.

It is planned next year, according to Assistant Dean D. W. Malott of the Harvard Business School, through which the awards are administered, to publish the results of the awards, with appropriate comments by the jury, in an effort to make the awards of further service to the advertising profession.

The awards were founded by Edward W. Bok in 1923. This year marks the fifth for this series of prizes.

C. A. Terry Elected on Westinghouse Board

Election of directors and modification of the by-laws marked the annual meeting of stockholders of Westinghouse Electric & Manufacturing Company held in the compay's East Pittsburgh headquarters on June 13.

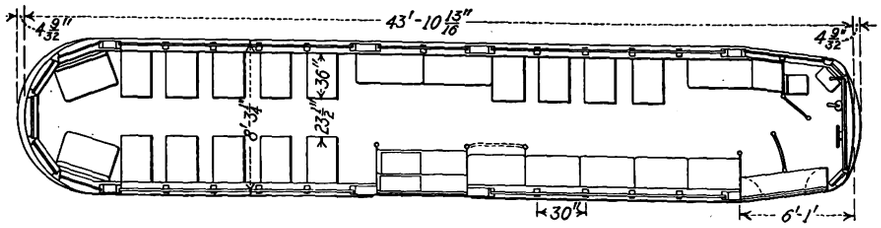
Of the four directors upon whom action was taken, three, whose terms had expired, were re-elected. These were Joseph W. Marsh, of General Cable Company, H. H. Westinghouse, of Westinghouse Air Brake Company, and Albert H. Wiggin, of Chase National Bank. The new director, Charles A. Terry, Westinghouse Electric vice-president, takes the directorship left vacant by the death of Gen. Guy E. Tripp.

Change in the by-laws under which

Specifications on 100 Cincinnati Cars

One hundred cars to cost $1,300,000 have been ordered by the Cincinnati Street Railway, Cincinnati, Ohio, from the Cincinnati Car Company, as mentioned in the May 19 issue of the JOURNAL. The cars are of the single-end, double-truck, quick loading type with front entrances and center exits.

Each car is 44 ft. 7⅜ in. long, 8 ft. 3¼ in. wide and weighs 31,000 lb. The bodies are of steel construction and special attention has been given to the elimination of noise. The car fronts will be fitted with non-shatterable glass. The center exit doors will be treadle operated. Cross seats will be used except on one side of the front section where longitudinal seats will be installed. Further specifications are given below.



Type of unit	One-man, two-man, motor, passenger city, single end, double truck
Number of seats	50
Date of order	May 17
Delivery	Beginning July 1, 1928
Weight, total	31,000 lb.
Bolster centers	25 ft. 8 in.
Length over all	44 ft. 7⅜ in.
Truck wheelbase	5 ft. 4 in.
Width over all	8 ft. 3¼ in.
Height, rail to trolley base	10 ft. 8 1/16 in.
Body	Semi-steel
Roof	Wood, arch
Doors	Center and end, folding
Air brakes	General Electric, with safety features
Axles	Annealed steel, A.E.R.E.A. standard
Car signal system	Faraday buzzers
Control	Type K
Curtain fixtures	50 cars National Lock Washer, 50 cars Railway Curtain Company
Curtain material	Pantasote
Destination signs	Hunter illuminated
Door mechanism	National Pneumatic
Energy saving device	Economy meters
Fare boxes	Cleveland
Gears and pinions	50 cars Westinghouse; 45 car Tool Steel; 5 General Electric
Hand brakes	Cincinnati
Heaters	Railway Utility panel type
Headlights	Ohio Brass WDF dash Type
Headlining	¼-in. Agasote
Interior trim	Cherry, oxidized bronze trimmings
Journal boxes	Cincinnati cast steel, spring mounted
Motors	95 cars, four Westinghouse 510; 5 cars, four G.E.-265, inside hung
Sash fixtures	90 cars Curtain Supply Company 10 cars O. M. Edwards
Seats	Hale-Kilburn deluxe No. 108
Seating material	Brown Spanish leather
Slack adjusters	Anderson automatic
Steps	Stationary
Step treads	Cast aluminum
Trolley catchers	OB-13141
Trolley base	US-22A
Trucks	Cincinnati Arch-bar type
Ventilators	Railway Utility Company
Wheels	Rolled steel, 26 in. diameter
Wheelguards or fenders	H-B life guard

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the fiscal year of the company now conforms with the calendar year was ratified. Due to the change in the fiscal year, the annual meeting of stockholders will be held in the future on the second Wednesday in April instead of the second Wednesday in June, as has been the custom.

New Seats for Pacific Electric Cars

Plans for improvement in a total of 198 passenger cars have been made by the Pacific Electric Railway, Los Angeles, Cal. Representing an expenditure in excess of $105,000, the work to be done consists largely of providing new comfort-giving features to existing interurban equipment, including the installation of 1,260 new heavily cushioned double seats.

Plans made consist of improving 45 of the railway's 950-class cars with an improved type of upholstered seat. Finished in brown Spanish leather, these seats are to be of deep cushion type, with divided back, and double spring.

In addition, the open sections of the 45 cars are to be closed in to avoid the strong winds, cold and dampness.

A total of 111 of the Pacific Electric's 800-class interurban cars used on various lines also are to undergo extensive improvements. Plans made call for the removal of wooden slat seats and substitution of upholstered seats, also the closing in of all open sections.

The company's 1,000-class cars, 42 in number, are to be improved by substitution of upholstered seats for wooden seats.

The improvements follow betterments recently made by installation of new relays which were designed to provide additional speed through faster getaway.

Tire Prices Cut

Reductions in tire prices of from 4 to 17 per cent have been made by the Firestone Tire & Rubber Company. The average reduction on all classes of tires is approximately 10 per cent. First grade low pressure tires were reduced 12½ to 15 per cent; third-grade tires 4 per cent, and solids 10 per cent. The extreme reduction applies only to products that now are almost obsolete.

The cuts were promptly followed by the Lee Tire & Rubber Company and the General Tire & Rubber Company, commensurate reductions being made in both instances. The Kelly-Springfield Tire Company announced that it would meet the reductions, and it is expected that Goodyear, Goodrich, United States Rubber, Fisk and other large tire manufacturers will follow suit.

Reductions have been considered inevitable in view of the 50 per cent decline in crude rubber prices that took place earlier in the year. Rubber quotations were just under 40 cents a pound at the beginning of the year, but drastic declines took place when announcement was made in the British House of Commons that a commission had been appointed to consider the advisability of discontinuing the Stevenson rubber export restriction plan. On April 4 Premier Baldwin announced that all restrictions would be abandoned on Nov. 1, and rubber dropped thereafter to 19 cents.

ELECTRIC RAILWAY MATERIAL PRICES—JUNE 12, 1928

Metals—New York

Copper, electrolytic, cents per lb	14.525
Lead, cents per lb	6.30
Nickel, cents per lb., ingot	35.00
Zinc, cents per lb	6.525
Tin, Straits, cents per lb	48.50
Aluminum, 98 or 99 per cent, cents per lb	23.90
Babbitt metal, warehouse, cents per lb.:	
Commercial grade	53.00
General service	31.50

Bituminous Coal

Smokeless Mine Run, f.o.b. vessel, Hampton Roads, gross tons	4.175
Somerset mine run, f.o.b. mines, net tons	1.825
Pittsburgh mine run, Pittsburgh, net tons	1.775
Franklin, Ill., screenings, Chicago	1.70
Central, Ill., screenings, Chicago	1.55
Kansas screenings, Kansas City	2.50

Track Materials—Pittsburgh

Standard steel rails, gross ton	$43.00
Railroad spikes, drive, ⅝ in. and larger, cents per lb	2.80
Tie plates (flat type), cents per lb	2.15
Angle bars, cents per lb	2.75
Rail bolts and nuts, cents per lb	3.90
Steel bars, cents per lb	1.875
Ties, white oak, Chicago, 6 in. x 8 in. x 8 ft.	$1.40

Hardware—Pittsburgh

Wire nails, base per keg	2.60
Sheet iron (24 gage), cents per lb	2.75
Sheet iron, galvanized (24 gage), cents per lb.	3.6
Galvanized barbed wire, cents per lb	3.35
Galvanized wire, ordinary, cents per lb	3.10

Waste—New York

Waste, wool, cents per lb	18.
Waste, cotton (100 lb. bale), cents per lb.:	
White	17.25
Colored	13.5

Paints, Putty and Glass—New York

Linseed oil (5 bbl. lots), cents per lb	11.1
White lead in oil (100 lb. keg), cents per lb.	13.75
Turpentine (bbl. lots), per gal	$0.635
Putty, 100 lb. tins, cents per lb	5.50

Wire—New York

Copper wire, cents per lb	16.625
Rubber-covered wire, No. 14, per 1,000 ft.	5.3
Weatherproof wire base, cents per lb	17.125

Paving Materials

Paving stone, granite, 5 in., f.o.b. New York—Grade 1, per thousand	$150
Wood block paving 3½, 16 lb. treatment, N. Y., per sq.yd., f.o.b.	$2.70
Paving brick 3½x8½x4, N. Y., per 1,000 in carload lots, f.o.b.	51.00
Paving brick 3x8½x4, N. Y., per 1,000 in carload lots, f.o.b.	45.00
Crushed stone, ¾-in., carload lots, N. Y., per cu.yd., delivered	3.375
Cement, Chicago consumers' net prices, without bags, f.o.b.	2.05
Gravel, ¾-in., cu.yd., delivered	3.375
Sand, cu.yd., delivered	2.125

Old Metals—New York and Chicago

Heavy copper, cents per lb	12.125
Light copper, cents per lb	10.675
Heavy yellow brass, cents per lb	7.25
Zinc, old scrap, cents per lb	3.25
Lead, cents per lb. (heavy)	4.875
Steel car axles, Chicago, net ton	$16.25
Cast iron car wheels, Chicago, gross ton	13.75
Rails (short), Chicago, gross ton	15.50
Rails (relaying), Chicago, gross ton (65 lb. and heavier)	28.50
Machine turnings, Chicago, gross ton	7.

ROLLING STOCK

PACIFIC ELECTRIC RAILWAY, Los Angeles, Cal., is calling for bids for four 62-passenger motor coaches, eight 60-passenger trail coaches and six 52-combination passenger and baggage coaches, bids receivable to noon June 25 at the Los Angeles office.

UNITED ELECTRIC RAILWAYS, Providence, R. I., is considering plans for the purchase of 50 cars.

PITTSBURGH RAILWAYS, Pittsburgh, Pa., has decided to equip fifteen interurban cars of the 3,700 series with individual bucket-type seats.

MONTREAL TRAMWAYS, Montreal, Quebec, Canada, is reported to be planning approximately 25 new cars.

HYDRO-ELECTRIC RAILWAYS, Toronto, Canada, is rumored to be making plans for eight interurban cars.

DELAWARE POWER COMPANY, Wilmington, Del., has been asking for bids on ten new cars.

TRACK AND LINE

BRITISH COLUMBIA ELECTRIC RAILWAY, Vancouver, B. C., Canada, will relay car tracks on Pender Street West. The portion between Granville and Nicola Streets will be relaid on existing foundations and from Nicola to Cardero Streets on new foundations. The company intends to rebuild about 2,000 ft. of double track with permanent standard construction.

OKLAHOMA RAILWAY, Oklahoma City, Okla., is making preliminary plans for a 1.3-mile track extension of the Las Vegas car line in Oklahoma City, at an approximate cost of $35,000.

SHOPS AND BUILDINGS

SOUTHERN INDIANA GAS & ELECTRIC COMPANY, Evansville, Ind., will make extensions on its power plant and system to cost about $350,000.

WISCONSIN POWER & LIGHT COMPANY, Madison, Wis., will soon take bids for power plant changes to cost $100,000. The company is also making plans for an equipment, storage and distributing plant to cost about $30,000.

TRADE NOTES

CANADIAN GENERAL ELECTRIC COMPANY, Peterboro, Ontario, Canada, will spend $1,500,000 on building and new equipment.

J. K. B. HARE, recently manager of the Columbus, Ohio, office of the Westinghouse Electric & Manufacturing Company, has been appointed assistant central station sales manager, with headquarters at 150 Broadway, New York, N. Y.

BOTFIELD REFRACTORIES COMPANY, Philadelphia, Pa., announces that the Builders & Industrial Supply Company, Toledo, Ohio, has been appointed distributor for the Toledo district.

HEYWOOD - WAKEFIELD COMPANY, Boston, Mass., has appointed George E. Cornwall supervisor of its railway sales division.

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Consider Brill Seat Construction

Brill Seat No. 105 for single end cars and buses is a typical example of Brill seat construction.

The frame of the cushion and back is selected ash. An approved type spring is used which retains its shape and imparts unusually comfortable riding qualities.

Underneath the leather upholstery of the cushion one finds the following materials in the order named: cotton batting, interlaced hair, hair felt, duck, corrugated steel spring tops, wide jute webbing, steel reinforcement strips and the hour glass type springs. These materials form part of the standard construction in Brill Seats.

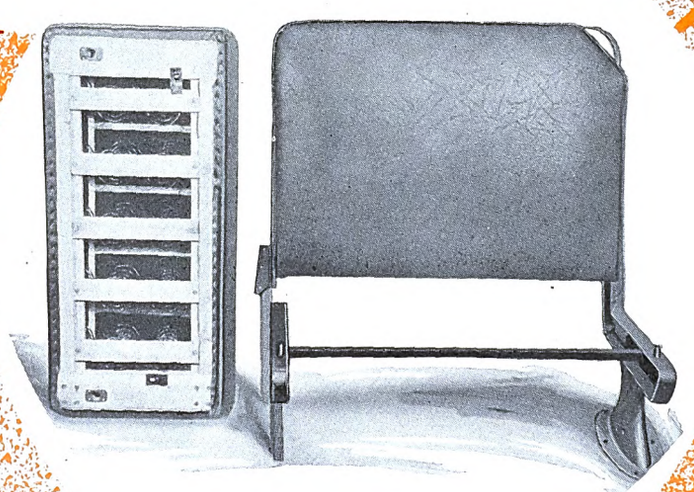
The pedestal is constructed of No. 14 gauge sheet steel.

Here, then, is a seat that is attractive, comfortable and certain to withstand many years of hard service. Among the transportation companies that have placed orders for this type of Brill Seat during the past year are the Youngstown Municipal Railway Co., Detroit United and the Cincinnati Street Railway Company.

Specify Brill Seats—it pays.

THE J. G. BRILL COMPANY
PHILADELPHIA, PA.

AMERICAN CAR CO. ST. LOUIS MO. — G.C. KUHLMAN CAR CO. CLEVELAND, OHIO. — WASON MANF'G CO. SPRINGFIELD, MASS.



Brill Seats Build Transportation Sales

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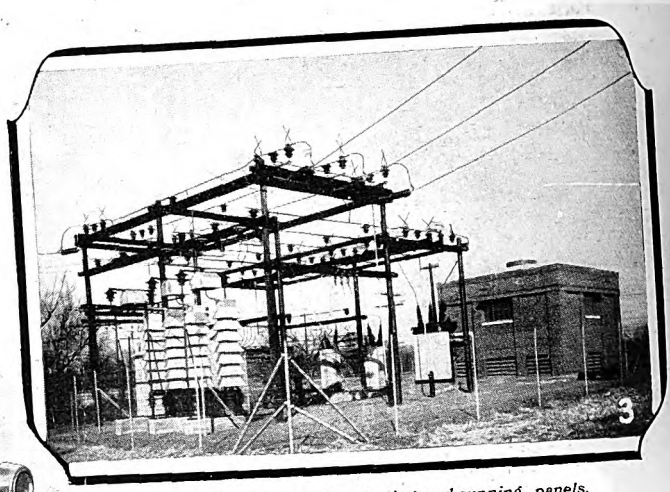
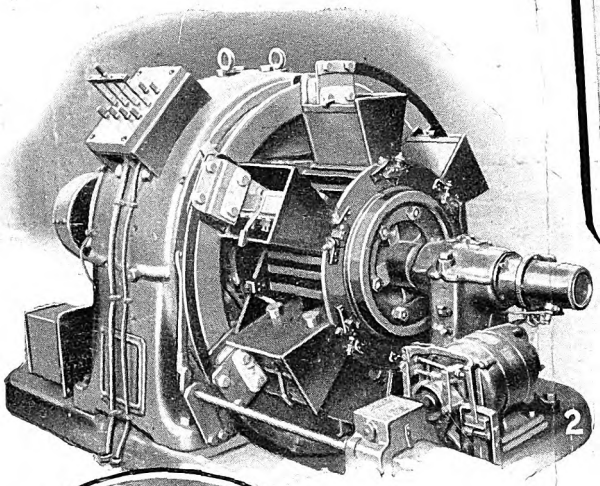
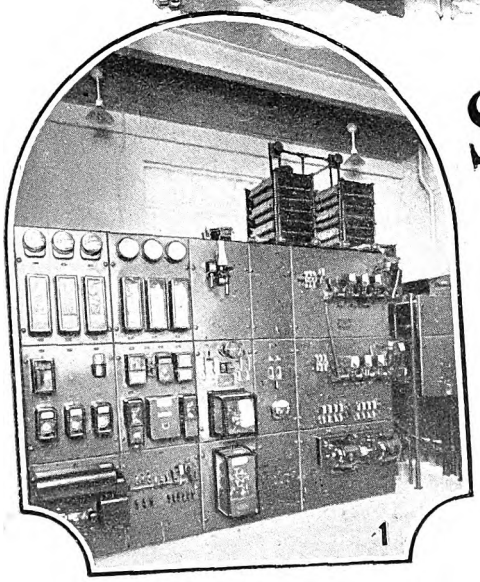




1.—*Control panels, starting and running panels, and load-limiting resistance*

2.—*300-kw. automatically controlled synchronous converter*

3.—*Automatic Railway Substation — Texas Interurban Railway*



Substation operation for only $970 a year

G-E automatic equipment enabled the Texas Interurban Railway to operate and maintain its five substations at an average cost of $969.57 in the year 1926. This includes repairs, inspection, oil, and all other incidentals except interest and depreciation, and amounts to only half a cent per car mile.

Substation operators can appreciate this unusually low operating and maintenance cost of automatic substations as compared with that of other types.

Through the use of G-E automatic equipment, you also can operate and maintain your substations with great economy and dependability.

General Electric experts are always ready to help you solve your substation problems. Communicate with the nearest G-E office.

130-4

GENERAL ELECTRIC

GENERAL ELECTRIC COMPANY, SCHENECTADY, N. Y., SALES OFFICES IN PRINCIPAL CITIES

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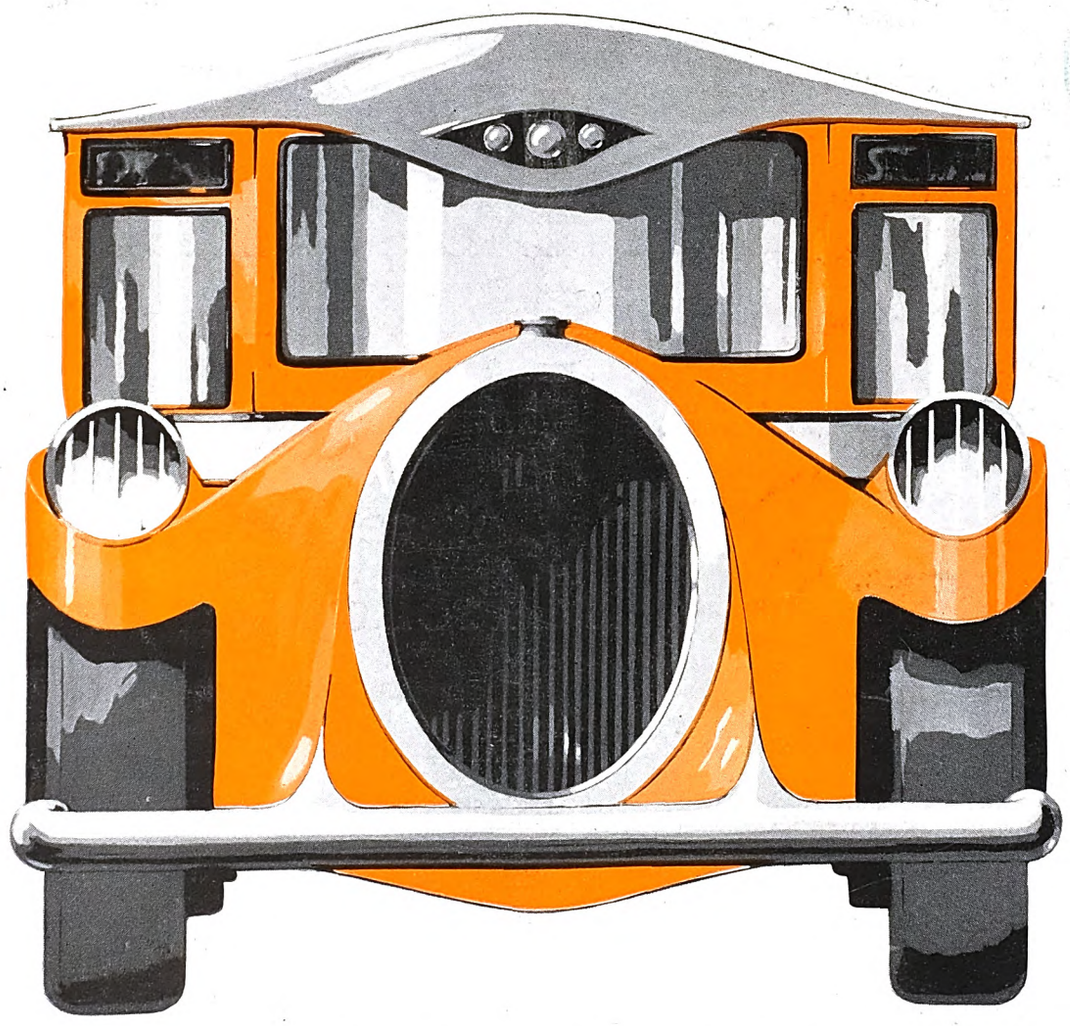
ELECTRIC RAILWAY JOURNAL

cGraw-Hill Publishing Company, Inc. JUNE 23, 1928 Twenty Cents Per Copy

JUN 25 1928



In all the swift evolution of the motor coach the whole effect on Timken Bearings has been that more and more makers keep using them in more and more places. Many makes are equipped *throughout* with Timken Bearings—the same bearings which combine the low rolling resistance and high wear resistance essential for modern railroad car journals.

THE TIMKEN ROLLER BEARING CO., CANTON, OHIO

TIMKEN *Tapered Roller* BEARINGS

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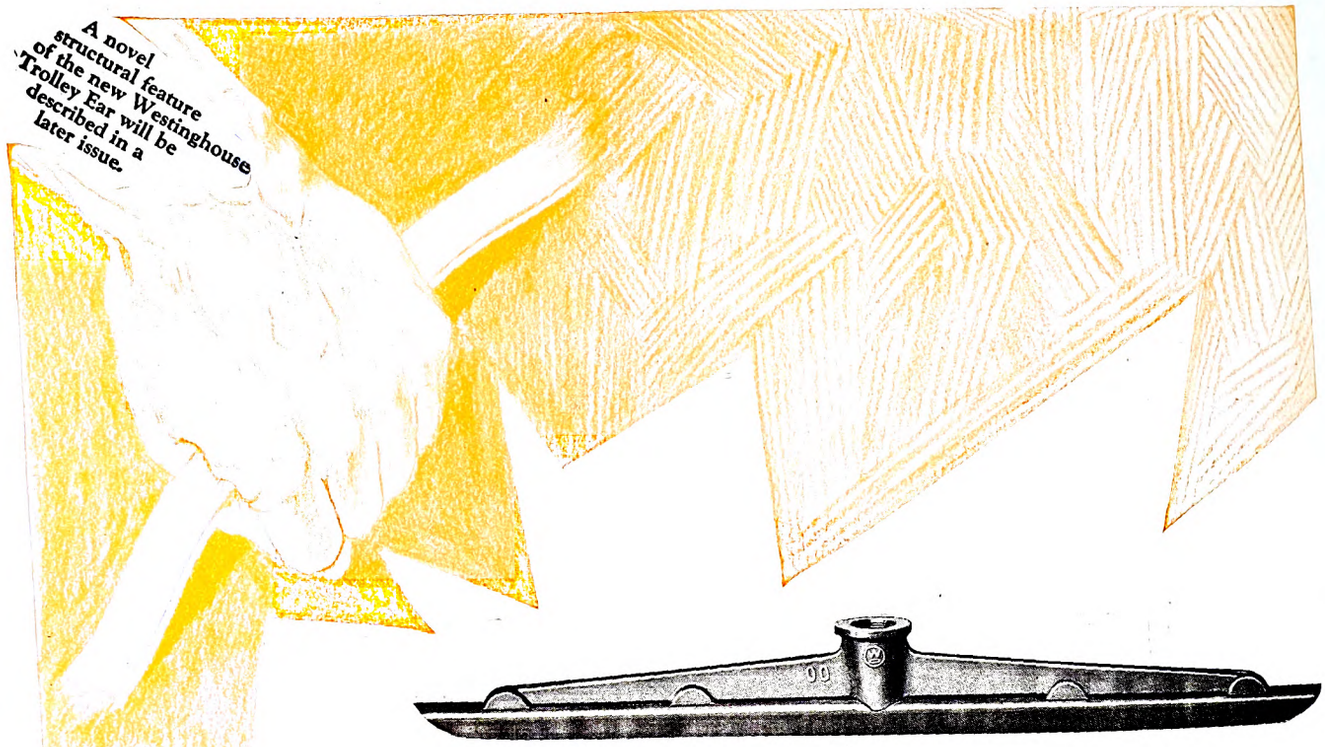

The "CHAMPION"

Plenty of reasons why this *new* Trolley Ear excels!

1 80 percent conductivity

2 Uniform thickness of lips

3 15 percent reduction in weight

4 Less burning—longer life

5 Lips made of pure bronze

6 Special alloy used in body of ear

7 Tensile strength of body—80,000 pounds per square inch

8 New process of permanent mould casting

Westinghouse Electric & Manufacturing Company
East Pittsburgh Pennsylvania
Sales Offices in All Principal Cities of the United States and Foreign Countries

MEMBER AMERICAN ELECTRIC RAILWAY ENGINEERING ASSOCIATION AERA 1928

WESTINGHOUSE ELECTRIC

Westinghouse

X98176

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Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

McGraw-Hill Publishing Co., Inc.
JAMES H. MCGRAW, *President*

LOUIS F. STOLL, *General Manager*
CHARLES GORDON, *Editor*

Volume 71 New York, Saturday, June 23, 1928 *Number 25*

An Indicator of Progress

JUST as straws show which way the wind blows, so the trend of thought at electric railway association meetings reflects conditions in the industry. In the past there have been periods of despair, of doubt, of hopelessness. These have followed each other during the past ten years, and have shown unfailingly the attitude of the leaders. It has been interesting to note the progressive change for the better as developed in this manner from meeting to meeting.

This spring there has been a series of association meetings at which there has been a new note. There has been a distinct atmosphere of cheerfulness and an exchange of ideas that show that managers and other executives have been thinking in terms of success. The tone of the papers presented has been of a different order from that of others in recent years. They have told of improvements in methods, improvements in physical property, improvements in human relations. Their dominant theme has been accomplishment. It has not been enough to say, for example, that street traffic ought to be regulated or that it must be regulated. Speakers have told how it can be regulated and how it has been regulated. So it has been with other phases of electric railway operation.

Discussions, too, have been unusually valuable. When a man has done something different from that mentioned by the principal speaker and has reached the same or a different conclusion, he has not been hesitant to give his opinion. Such discussions can come only from men who actually have been devoting their time to intensive study and who have been trying out in practice the theories they have developed.

Signs such as these are among the most definite indications seen in many months that the industry has taken hold of itself, and has thrown off the defeatist attitude that held it back for so long. May the forward movement continue—and with ever-increasing momentum.

The Code That Conquers

"PLAY the Game Square," the vigorous title which J. N. Shannahan chose for his Mid-West paper, expresses a code that has paid in practice. He said in explanation that except in certain outstanding instances it seems to him "we ourselves have not met fast-changing situations with as much courage as we should and certainly not with the far-sighted vision needed to grasp in full the opportunities which changing conditions bring along with difficulties."

In expressing his views, Mr. Shannahan recognized that the cynic is always just around the corner. For when he said "we must put the cards on the table face up," he was quick to add that he knew this would sound trite. Here, however, he probably had in mind the strong temptation which always exists to keep an ace up one's sleeve. This point may well be pondered in the light of what has happened in the past. True, there have been grave ills due to the play of economic forces over which the individual at best has only slight control. But that does not explain the spirit of distrust on many properties at a time when they sorely needed intelligent public understanding.

It is as true of a company and even of an industry as it is of an individual, that "As ye sow, so shall ye reap." Of course, there are those in public councils that are unfriendly to the industry. But it is likewise true that there are sometimes divided councils within the industry. Many instances readily come to mind of situations which illustrate the inestimable harm which has been done not only to individual properties but to the industry generally, by action which smacks of sharp practice.

But it was not to find fault that Mr. Shannahan said the things he did. Rather, it may be assumed, his object was to indicate the common pitfalls that lie in the pathway of the unwary in the effort to improve the condition of a property. Public co-operation may be expected to grow only out of public confidence. When a record of straightforward dealing has been established, the interests of the public and the railways are identical. But that is true only as the character of service is satisfactory, the equipment modern and the management disposed to transportation progress. And the first two of these almost necessarily embrace the last. No code to which the electric railways might subscribe could be better conceived than that reflected in the remarks made by Mr. Shannahan.

This Fine and Unselfish Example

THUS O. H. Caldwell, federal radio commissioner, characterizes the action of the Third Avenue Railway in voluntarily relinquishing its radio broadcasting license for station WEBJ, New York City. Since 1924, when radio broadcasting was expanding rapidly, this station has been operating. It has spread the gospel of safety, the proper relations between the public and a transportation company, and the mutuality of interests existing between employee and employer. It has always maintained a high degree of mechanical and electrical efficiency. Moreover, those in charge of the railway's broadcasting have taken an active part in the scientific development of radio.

Except for the unselfish and public spirited desire of its owners to assist the larger aims of radio there is no reason for its discontinuance. This is conclusively proved by the fact that it was not on the commission's blacklist

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of 162 stations throughout the country, 25 of which were operating in the metropolitan area.

In making the offer to suspend operations, President S. W. Huff subordinated private interest to the public weal. He wrote the commission that his company realized "the purpose for which your commission was created and the difficulty of your work." In word and deed here is an "unselfish example" of citizenship; something more than a gesture on the part of a transportation company. This kind of executive thinking must ultimately win real dividends in public friendship and good will.

Another New Car Makes Its Bow

ANOTHER new car is presented for the industry's consideration in an article printed elsewhere in this issue. In this fact alone there is nothing to elicit particular comment. New designs of rolling stock are now beginning to appear in steady procession, with increasing frequency, as the present industry-wide movement to develop equipment better suited to meet present-day transportation requirements gets into full swing. Nor do the technical features of the car itself or of its equipment represent such wide departures from conventional practice as to warrant particular attention. True, in the elimination of the customary foundation brake rigging and the use of automotive type brake diaphragms at each wheel with an otherwise conventional type of truck, another novel design idea is being tried. But beyond this and the use of double reduction gearing with high-speed motors, the construction of this latest sample car is quite conventional.

But there are, nevertheless, other factors connected with the building of this car that are of outstanding interest to the entire industry as indicators of trends that may have far-reaching effects. First of all it is worth noting that this sample car is entirely the enterprise of a car builder—not an operating company. It is a complete piece of equipment built to be sold and including the manufacturer's own ideas of design and construction; not a contract job built to a customer's specifications.

In American industry generally, this is the accepted practice. But a complete street car, built according to the manufacturer's own ideas and with the manufacturer's money, is a novelty. Two years ago at Cleveland there was shown for the first time a sample lightweight, high-speed interurban car which was entirely the design of a car builder. Last year at Cleveland there were two additional cars shown which could be put in this classification; one of them built by a bus manufacturer. Now comes another, and this year's convention will undoubtedly bring forth others. In this trend there is promise of increased initiative by the builders which should result in more consistent development than in the past and it is therefore worthy of the fullest co-operation and encouragement from operating executives.

Another feature of this latest sample car is the attention given to the matter of proportions and appearance. The merchandising appeal of sleek, graceful lines in a transportation vehicle is being recognized today as never before. Car designers are indeed beginning to take a leaf from the automotive industry's notebook. They are recognizing that ruggedness, economy, and efficiency, although of vital importance, are no longer the sole requirements for a satisfactory vehicle design. A car which attracts no passengers is unsuccessful, regardless of how efficient it may be. Just as the average automobile buyer knows little about what is under the hood, so also does the average car rider know little and care less about the structure and equipment of the street car upon which he rides. But the passenger and prospective passenger are quick to sense new features of architecture or comfort.

Even in appearance and lines, however, there is little that is particularly novel in this sample car. The sloping front window which gives a semi-automotive appearance, is used, but this arrangement has already been adopted on so many cars that it can no longer be considered an innovation. It is to the general proportions and to the details of construction that one must look for the features of greatest interest. The bottom line of the step is carried completely around the vestibule to give balance to the two sides of the car and to give the end a finished appearance. The doors are flush with the sides of the body when they are closed and the customary awkward offsets at the vestibule are eliminated. The relation between the height of the side sheets, windows, letterboard and roof was carefully considered from the standpoint of proportions. Although a side skirt was first tried, it was finally eliminated for this particular car.

It is probable that the builder would by no means consider this a final product. One hears of other plans on every side. Further radical changes from conventional practice are promised in projects that are even now under way. Faint rumors of the entrance of bus manufacturers into the field of car construction are persistent and are getting louder. From this growing activity, whetted by the stimulus of healthy competition, there may be expected rapid progress in meeting the demand for electric railway cars that will attract riders back to the use of public instead of private transportation.

A Mere Matter of $136,000,000

PHILADELPHIA lawyers are now engaged in the pleasant pastime of trying to unscramble the Philadelphia Rapid Transit Company's underliers. It is a friendly proceeding worthy of the supernatural powers that legend lends to the Philadelphia practitioners. If they achieve their object this time, it will be for the best, but they failed before in a similar task because of inanition or exhaustion. It all came about this way. A year ago Judge C. C. McChord, special investigator for the Pennsylvania Public Service Commission, suggested that the financial eggs be made into a real omelet. Some of the eggs never have had their shells completely broken and others were slightly addled when they went in. But the omelet, such as it is, apparently awaits only the wielding of the financial wizardry of $136,000,000 of the city's funds.

If money talks, that sum ought to make a loud noise, but the holders of the securities of the underlying companies of the P.R.T. appear to be particularly hard of hearing. For good reasons they are enamored of their possessions. Others see the underliers only as the Old Man of the Sea riding on the P.R.T.'s back. It is a situation not peculiar to Philadelphia, and one that the committee on finance of the American Electric Railway Association has suggested be corrected wherever possible.

Apparently nobody except their owners loves the companies underlying P.R.T. In one way or another they extract from the property nearly $9,000,000 a year. Their number seems almost legion. Certainly their family tree is intricate. If his suggestion be correctly

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understood Judge McChord proposes that the city purchase the underliers, lock, stock and barrel, for about $102,000,000 plus the face value of $33,500,000 of bonds, a total, in round figures, of $136,000,000. This estimate of the value of the underlying stocks is figured in two ways: by capitalization of their returns at 7 per cent, and by an average of their market prices over a period of eight years. The result is approximately the same, whichever method is followed.

It has been explained that on this $136,000,000 of landlord value, the P.R.T. as tenant pays each year besides $9,000,000 of rent $1,432,403 of taxes which it is said could be eliminated. The idea is that as the city could become the landlord by borrowing the $136,000,000 at 4½ per cent for the purchase of the underliers, there would be a saving for somebody of the difference between $10,303,138 of P.R.T. fixed charges and $5,780,000 of interest on the city's borrowed funds, or $4,523,138 a year in round figures.

Thus, as the Philadelphia *Record* put it some time ago, Mr. McChord has passed the magic wand over the silk hat into which have been scrambled the addled eggs of the underliers, and, rolling up his sleeve, has extracted therefrom the live rabbit. The secret, of course, seems to be the substitution of city credit for private credit. But between the apparition of the $4,523,138 a year saved and the actuality, there stand the protective committees of the underliers. It is their attitude which is being sought at the present hearing before the Public Service Commission, a proceeding probably without precedent. To that proceeding the P.R.T. is not a party. Succinctly stated the sole duty of the commission under the legislative act of 1927 is to determine the compensation or damages to be paid by the city as a partner of the P.R.T. to the owners of the property to be condemned by it. The end sought is desirable from the standpoint of economy and simplification of the financial structure of the P.R.T., but certainly if the plan is put through on the terms suggested, Judge McChord will have done more than propound a solution. He will have opened the way to a miracle.

Tangible Rewards to Careful Trainmen in Gary

VACATION time among trainmen of the Gary Railways is imminent. When the no-accident vacation report was compiled recently it became known that 96 trainmen out of 145 were entitled to five-day vacations with pay because they had gone through the year without having had a single accident charged to them. This number of no-accident vacations—just over 66 per cent—is the highest in the history of the company. Of equal significance, 27 of the 96 men have served four years without a chargeable accident, while one man who has been with the Gary Railways during the twenty years of its existence has enjoyed the benefits of the annual vacation award every year save one.

There are some who would argue that no particular consideration or reward should be attached to what, after all, constitutes simply a record of careful performance of duties. But if we are to believe modern safety doctrines, few accidents happen which could not have been prevented. Many properties have adopted various forms of awards—some use cash bonuses; others have safety dinners or outings. The vacation idea in Gary seems to offer a happy plan.

Expenditures in the settlement of accident damage claims constitute a very appreciable proportion of the gross revenue of a street railway. There is much evidence to show that the companies whose accident prevention campaigns have been most successful are those whose policy has been to share generously the benefits of accident reduction with their men.

The Added Responsibility of Their Separation

NO OTHER piece of recent news affecting the electric railways is in its way more significant than the reported sale by the New York Central Railroad of its holdings in the electric railway properties in Rochester, Syracuse, Utica and other cities. Pending the conclusion of the financial details, it is of course unlikely that any program for the future conduct of the railways will be laid down. That the roads will be operated separately from the power holdings, if the new owners retain them, does, however, appear to be certain. That is a good thing.

In the past these roads along with other properties of their kind have suffered from the distracting economic changes in the field of transportation. They have not, perhaps, been as militantly managed as might have been wished, but that no doubt is attributable to the owners rather than those charged with operation of the properties. It is easy to understand this. A steam railroad is a large and inflexible organization and the very magnitude of its operations tends toward the subversion of local impulses and reactions. Electric railways, on the other hand, are intimately associated with the affairs of a community, and must be sensitive to local conditions. It was not until the Connecticut Company had been separated from the New Haven Railroad that Mr. Storrs was able almost entirely to reverse the situation with respect to that property, and it was undoubtedly the example which he set that later caused the New Haven to confer on its local responsible operating officials in Worcester and Springfield the necessary detached authority which has enabled them to carry out the program which now promises so much for these properties.

All this is cited merely as pointing to the new owners the possible future of the roads in central New York. That future is theirs to make or mar. There is more in this suggestion than just a nicely turned phrase. The railways are, perhaps, doing as well as could be expected. Managerial talent of high order is in charge of the roads. On their part the new owners are in a position to make an adequate survey of the situation and to map out a program for the future that will permit the properties to be developed in the militant way that is needed. Already the bus and the trolley bus have come to play their part in these systems, but whether they are doing it to the extent that is possible and advisable only a survey of the kind suggested would show.

The Rochester road has an arrangement with the city in its modified service-at-cost plan that promises well for the future, and the situation in Syracuse, particularly in the matter of fares and public relations, appears to be satisfactory. With the inhibitions inherent in the former ownership removed, further improvement may be expected in the situation in upper New York. This holds true whether or not the so-called Phillips interests retain the roads. So far as they are concerned, their record with their other properties indicates they are thoroughly alive to the fact that the first step in successful public relations is performance.

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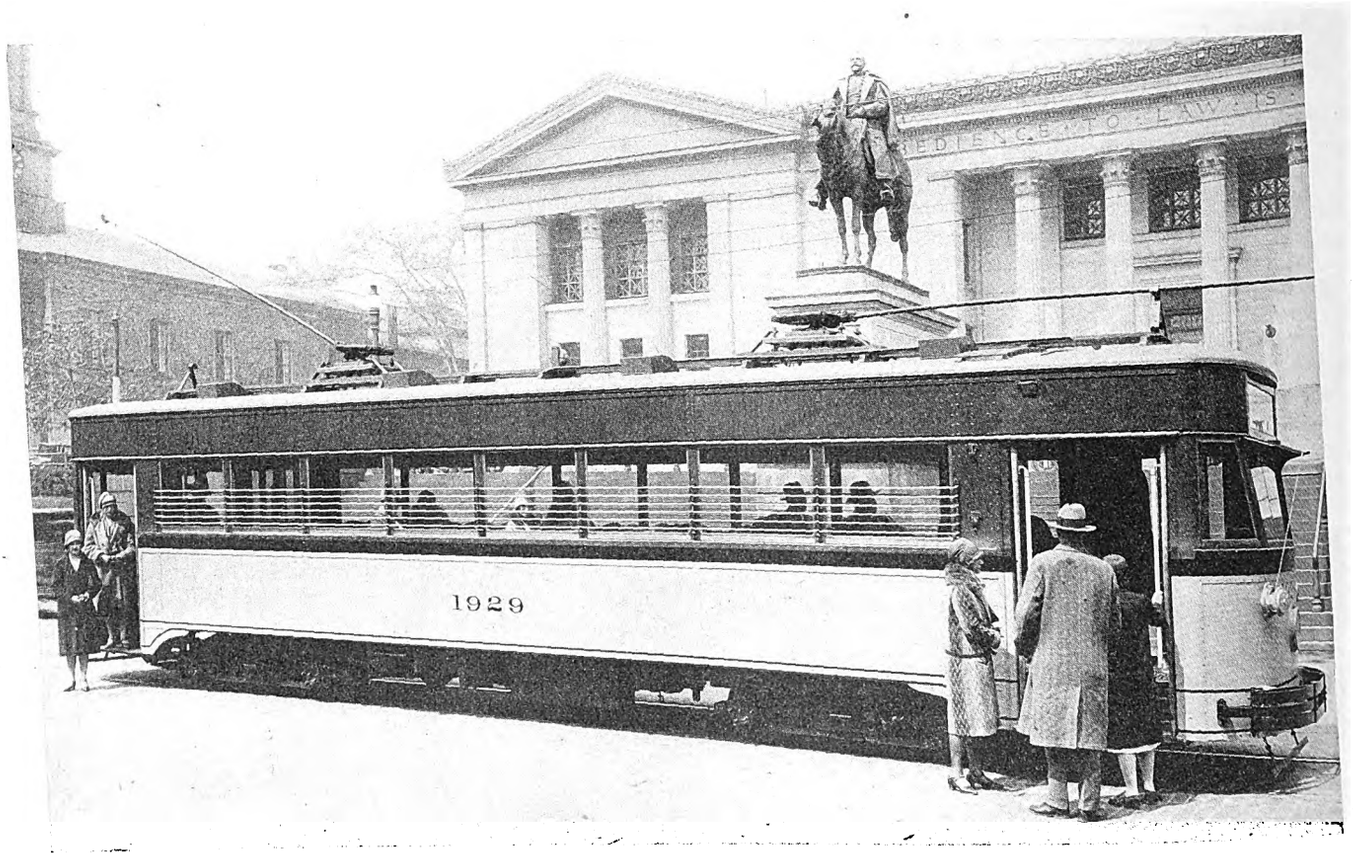
Osgood-Bradley Develops

New Model Sample Car

Car builder recognizes modern transportation requirements in sample unit intended for average size city conditions. Detailed attention given to improvements of appearance and performances



Sample car designed by Osgood-Bradley Car Company to meet 1929 transportation conditions. No attempt was made to achieve extreme light weight, but special attention was given to the proportions and appearance of the body

STUDY of recent trends in car design, and of the demand for an average-size city car with which to meet present-day automobile competition, has led the Osgood-Bradley Car Company to build a sample car representing the ideas of its own engineers. The objective in the design was to combine the pleasing appearance of balanced proportions and smooth body lines, with quiet operation, rugged construction and low maintenance cost. It is the intention of the builder, after tests of this sample car are completed, to adopt this model as a manufacturer's standard for average-size cities, and gradually to perfect the design as experience and customer demand dictate. The ultimate purpose is an attempt to develop a model which can be built on a production basis and which can be sold at an attractive price in small or large lots.

With these objectives in mind, the sample car is built for double-end operation and is of the straight side type with rounded ends, sloping end windows and low arch roof. Careful consideration and detailed study were given to the several factors which affect the appearance of a car. The sample unit was first built with a skirt below the side sills, extending entirely around the bottom in a straight horizontal line. Further study led to the conclusion that an upward sweep of the lower line of the body between the corner posts gives a more graceful appearance than does a straight horizontal line around the bottom. Consequently, the idea of a skirt below the body was abandoned.

Accompanying illustrations show the appearance of the completed sample car. Vestibule doors are double, folding inwardly on each side. Maximum flexibility of the car is provided by arranging the controls for either one-man or two-man operation. These doors are set flush with the body and vestibule corner posts and

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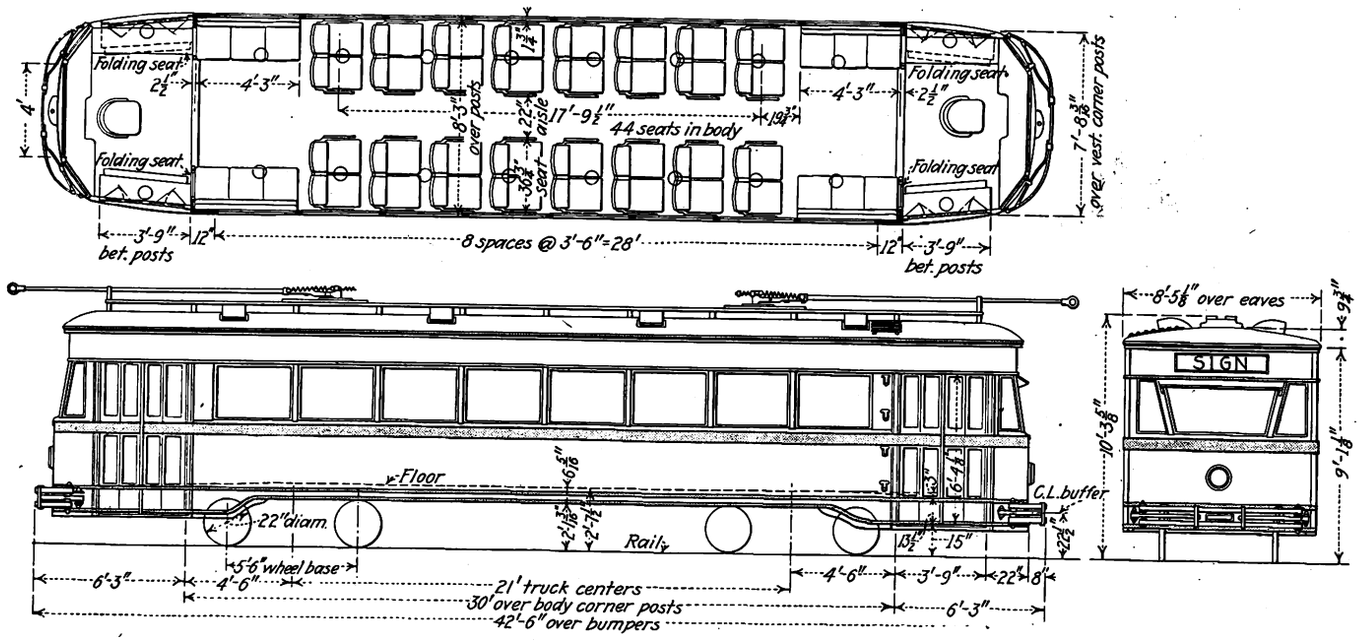
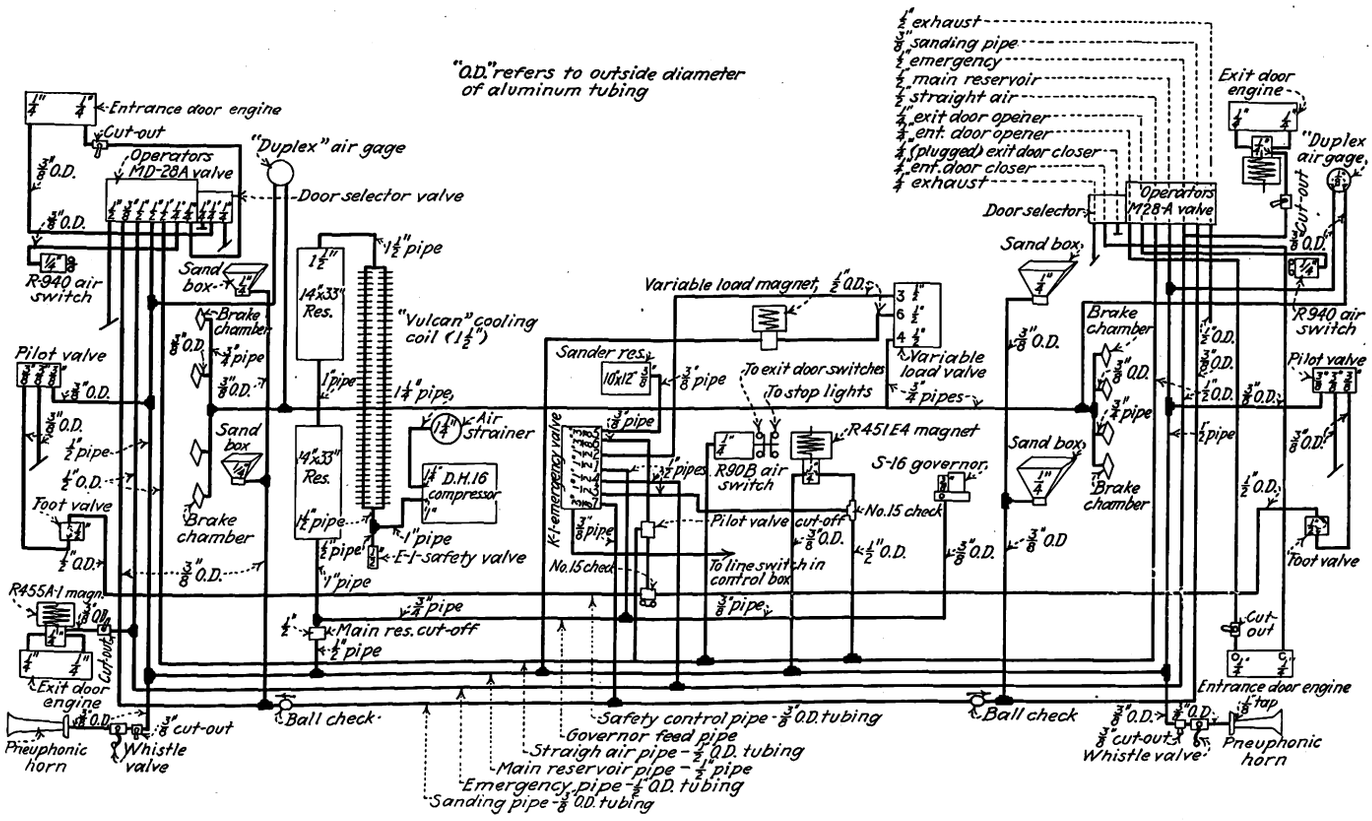


General dimensions of the Osgood-Bradley sample car are designed to meet average-size city conditions. Seating capacity in the body is 44. Folding vestibule seats increase this to 51 or 54, depending on the plan of operation

when they are closed present a smooth exterior without offsets. Horizontal lines are carried out unbroken around the body and vestibules. This is particularly noticeable around the bottom of the letterboard, at the belt rail and in the glass lines of body, doors and vestibules. Although the roof is comparatively low, there is no offset in the letterboard above the doors. Adequate headroom was obtained by careful attention to the installation of door engines and door headers, and to the arrangement of the inside step at the front and rear ends of the car.

Although no skirt is used below the sides of the body, the vestibule dash is carried down to the bottom line of the step, so that an unbroken bottom line is formed entirely around the vestibule and under the doors. This line sweeps up to meet the bottom line of the body side sheet at both ends and on both sides of the body. Thus the appearance is symmetrical on the operating side and on the blind side of the car in whichever direction it is running.

The exterior is finished in attractive, contrasting colors of Duco, above and below the belt rail, and a wide stripe



Complete piping diagram. Compressed air is conducted directly to brake chambers mounted on the trucks. The usual foundation brake rigging is eliminated

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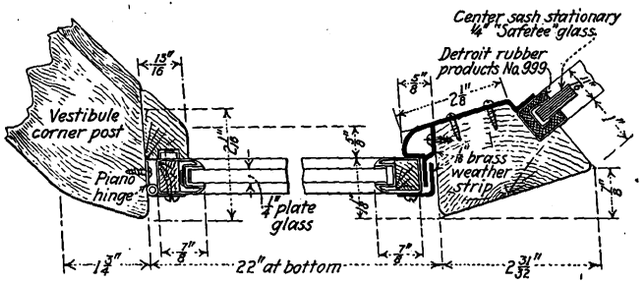


Horizontal section through hinged side sash in vestibule, showing weatherstrip arrangement

is carried entirely around the car just below the window line. Narrower stripes on the letterboard and along the bottom of the body help to accentuate the streamline effect. Although the sloping type of end vestibule window, which has been a characteristic of several recent experimental cars, is used, the vestibule belt rail and dash are curved instead of being made flat on the end as in several other recent cars.

The total length of the car is 42 ft. 6 in. over the bumpers. Extreme width over the eaves is 8 ft. 5⅛ in., and the height from rail over trolley boards is 10 ft. 3⅝ in. On 22-in. diameter wheels, the floor height is 31½ in. above the rail. The vestibule door openings are 3 ft. 9 in. between posts. The length of the body over corner posts is 30 ft. There are seats within the body proper for 44 passengers. When the car is run as a one-man unit, the right-hand front doors being used for entrance and the rear for exit, the folding platform seats on the left side may be utilized to increase the seating capacity to 51 passengers. If only the right-hand front doors are used for both entrance and exit, the seating capacity is increased to 54 through the use of both folding seats in the rear vestibule.

No effort was made to achieve ultra light weight. Standard structural shapes have been used in framing, the desire being to produce a car as light as possible consistent with adequate strength and ruggedness to withstand the stresses of regular service, with a liberal margin of safety. The car is reported to weigh approximately 30,000 lb. complete.

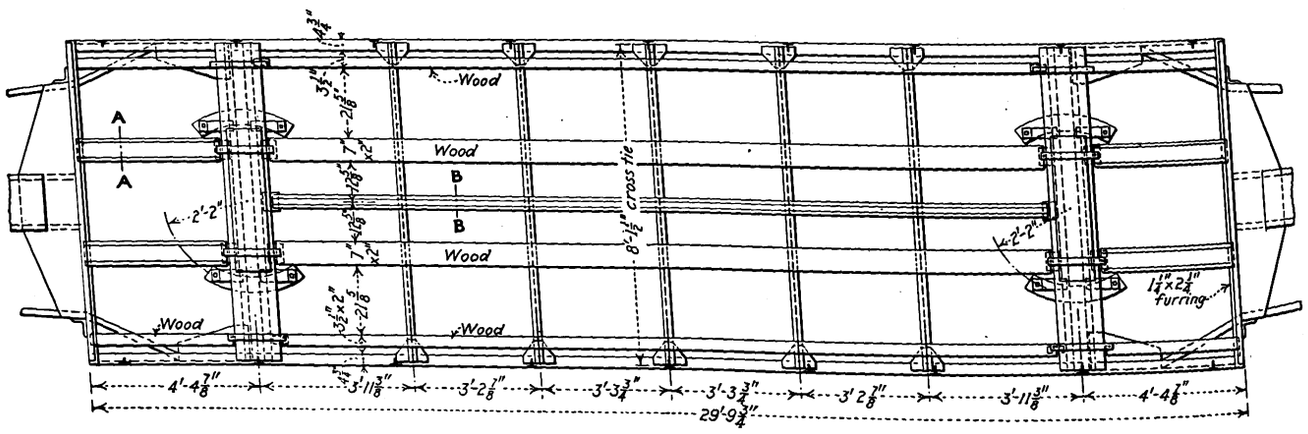
The platform framing is unusual, particularly in the design of attachments to the body end sills and body side sills. There are two platform center sills, extending from the buffer to the body end sills. To these center sills there is riveted a cover plate that forms a horizontal girder to provide lateral stiffness. At the bumper and the body end sill there are anti-telescoping plates designed to transmit buffing stresses through the platform side sills directly to the body side structure. The platforms are carried directly from the body side girder through the end sills and special steel corner post and gusset construction. The side sills are reinforced from the body corner posts across the second window panel at each corner of the car. The body bolsters are of an especially shallow built-up box girder design, and are of uniform depth throughout their length to keep the floor height at a minimum.

Rolled tee side posts and carlines of the body framing are not continuous. They are connected by double-riveted gussets, thus permitting the sides and roof to be built on jigs. This, it is claimed by the builder, will insure interchangeability of the various units and simplify repairs when the car has been damaged in an accident. The entire vestibule above the platform framing is of wood, the platform framing, vestibule end framing and hoods also being arranged for jig construction. In working out the details of the vestibule design, particular attention was given to ready replacement and repair in the event of collision damage.

Roof and Floor Details

The body roof is built of tongued and grooved poplar boards laid longitudinally and secured to the wood carlines and steel carline furrings with cement-coated nails. The whole roof is covered with a single piece of No. 8 cotton duck. The body and vestibule floors are continuous, with a ramp of 3 in. to reduce the step heights. In the car body the floor is finished with Flexolith composition laid on Chanarch corrugated steel. The floor in the vestibules is made of fir covered with wide maple slats laid transversely.

Ceilings in the body and vestibules are continuous, and are finished with Agasote headlining. Selected mahogany, stained walnut color and finished with rubbed varnish, is used for all interior wood trim and for the vestibule doors. These doors on each side of each vestibule are operated by Consolidated Car Heating Company air engine equipment. A one-man car operator, through use of the Westinghouse M-28 brake valve and selector valve, may at will control either the front right-hand doors or the rear right-hand doors, or may operate both front and rear right-hand doors simultaneously. Valves are also installed at each end of the car so that for two-man operation the conductor at the rear of the



Structural steel shapes are used to build up a rugged underframe

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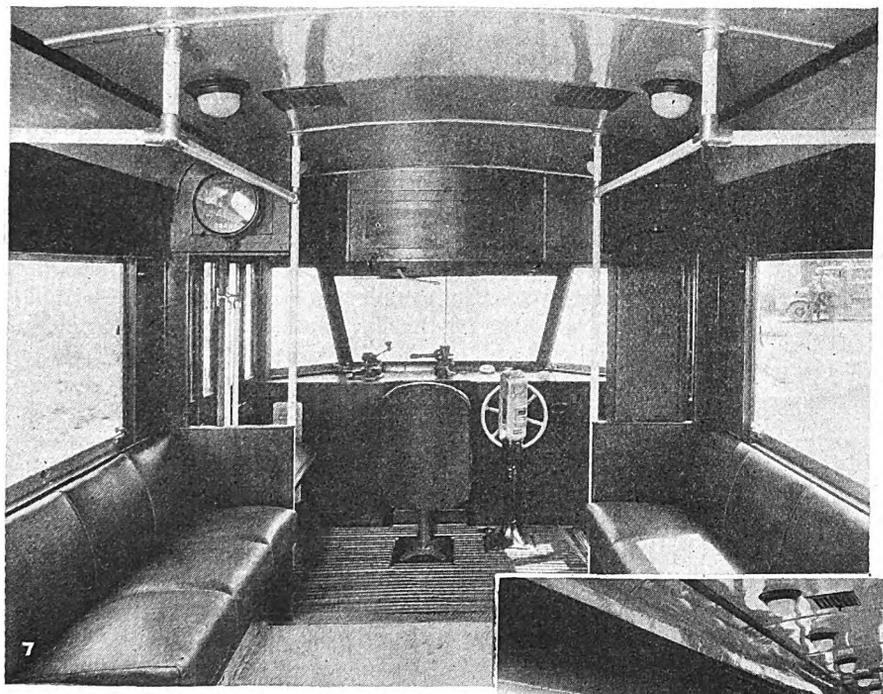
car may control the rear right-hand door. This arrangement makes it also possible, if desired, for a man in the front vestibule to control the front left-hand doors with the conductor's valve at that end. All steps are of the inside stationary type covered with Kass safety treads. The sample car is not equipped with treadle mechanism control for the rear right-hand doors, but arrangements are such that this device can be installed readily, if desired.

Signal lamps are arranged to indicate to the operator whether the doors are open or shut, and the door control is interlocked with the motor control so that the car cannot be started until all doors are closed. Attention was given to the design of the doors to eliminate the possibility of injury to passengers, not only from becoming caught between the two sections which meet at the center of the opening, but also to obviate the possibility of pinching a passenger's fingers between the hinged sections. This protection is afforded by composition rubber strips over the joints, similar in arrangement to the installation on the two experimental Pittsburgh cars which were described in the June 2 issue of this paper.



All control apparatus is within easy reach of the seated operator in this compactly arranged vestibule

Leather-upholstered, deep spring-cushioned seats insure passenger comfort. The car is arranged for double-end operation. Note the overhead rail handholds in the corners of the body

There are eight windows on each side of the car body, with 3 ft. 6 in. center to center window post spacing. The sash are the Curtain Supply Company Rex removable brass type, arranged to lift 16 in. There are no upper sash. The vestibule center end sash are stationary and are set at an angle to prevent the reflection of light from the car body into the eyes of the operator. The conventional curtain back of the operator is thus eliminated. These center vestibule windows are glazed with Safetee Glass Company shatterproof glass and are provided with Cinch Manufacturing Corporation hand-operated windshield wipers. A sun visor is also installed above the center window on the outside. An arrangement similar to that used on the Pittsburgh experimental cars prevents the formation of sleet on these center vestibule windows. This consists of a slot or duct extending through the top of the equipment cabinet so that the hot air from an electric heater in the operator's knee pocket, conducted upward against the inwardly sloping glass, maintains it at a temperature that prevents the formation of ice.

The vestibule side windows are framed in Curtain Supply Company brass sash, hinged at the vestibule corner posts by brass piano hinges, arranged to swing outwardly for ventilation, and controlled by a simple mechanism. These swing sash are also provided with weather-stripping to preclude the entrance of wind or water when the sash are closed. The body side windows are protected on the outside with window guards of aluminum rods. These are in sections which may be hinged downward to facilitate cleaning and washing windows. There are no body side window curtains.

Sixteen Heywood-Wakefield reversible cross seats are located eight on each side of a 21½-in. aisle in the body. A longitudinal seat for three passengers is built into each corner. The cross seats have grab handles and stationary foot rests. In each vestibule is an upholstered seat for the operator which is adjustable for height. It may be swung through 180 deg. to serve as a passenger's seat when at the rear of the car.

All seats are of the full-upholstered type with extra deep spring cushions and backs, the reversible seats having individual form-fitting backs. They are covered with Radel Leather Manufacturing Company chrome retanned, monkey-grain leather. Folding seats for three passengers each are provided on each side of each vestibule.

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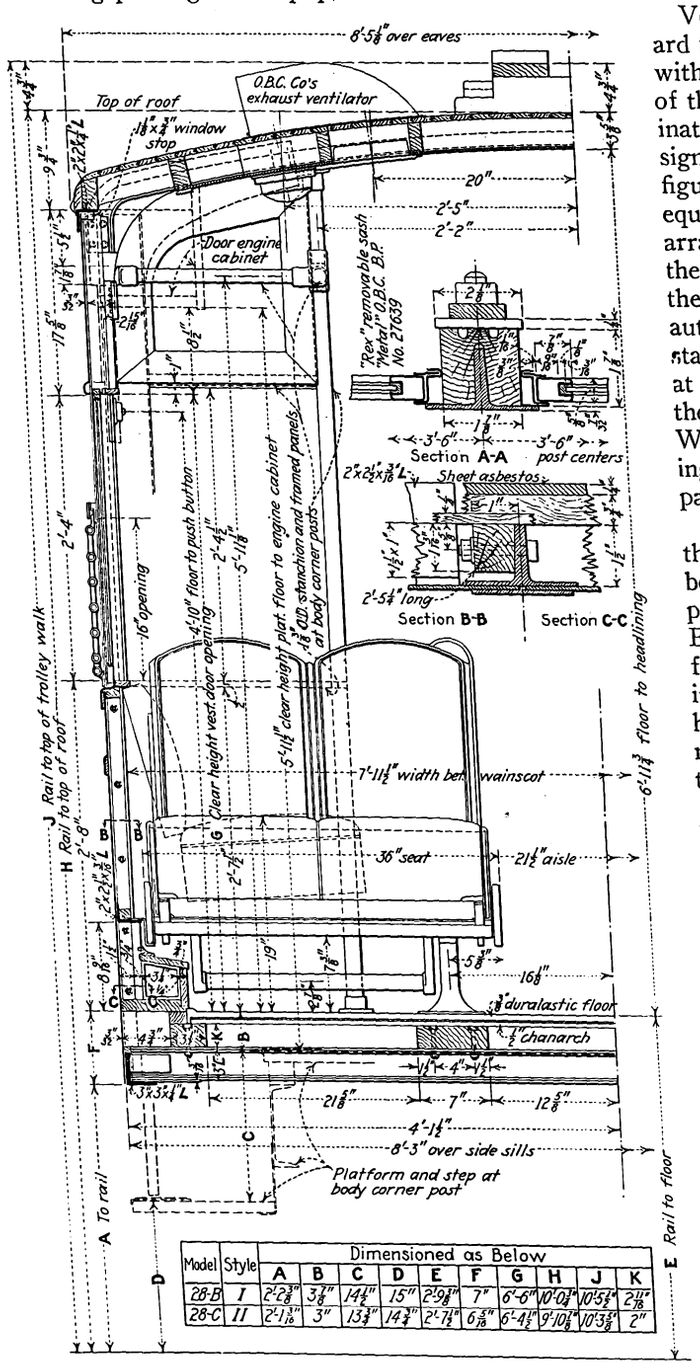
When in use these seats are folded down across the door opening. The hinges have springs so that when not in use the seats swing up out of the way into pocket spaces at the bulkhead.

At each corner of the car body a stanchion is installed. This forms a support for a stationary overhead railing handhold over each longitudinal seat for the convenience of standing passengers. Equipment cabinets and switch lockers are built into the vestibules so that all miscellaneous equipment, switches, etc., are concealed, although ready access to them is provided through suitable doors and removable panels. The covers of the controllers and switches are removed and the inside of the cabinets is lined, where necessary, with heavy asbestos. The only items of equipment which are exposed are the tops of the controllers and brake valves, and the handles of the Peacock staffless brakes at each end of the car. All operating apparatus, including the controller handle, brake valve handle, windshield wiper, sign box handle, reset switch handle and register cord are within easy reach of a seated operator. An Economy energy-saving meter is mounted inside the control cabinet near the entrance door. The dial is exposed so that it may be easily read either from the platform or through the door from the outside.



Model	Style	Dimensioned as Below									
		A	B	C	D	E	F	G	H	J	K
28-B	I	2'-2⅜"	3⅜"	14¼"	15"	2'-9⅜"	7"	6'-6"	10'-0⅛"	10'-5¼"	2 11/16"
28-C	II	2'-1 3/16"	3"	13¾"	14¼"	2'-7⅛"	6 5/16"	6'-4½"	9'-10⅛"	10'-3⅝"	2"

No effort was made to achieve extreme lightness in the design. This cross-section through the body shows the principal details of construction

Ventilation is obtained by eight Osgood-Bradley standard type of exhaust roof ventilators, each having a grille with a lever-operated adjustable shutter. At each end of the car is an Electric Service Supplies Company illuminated destination sign with 11½x46-in. opening. This sign is of unusual size so that route numbers with 10-in. figures may be used. Each end of the car is also equipped with a specially designed trip-gate lifeguard, arranged so that the single slat gate is carried out under the bumper while the lifeguard itself is well back under the vestibule. Heavy C.-G. Spring & Bumper Company automobile-type spring bumpers, similar to those installed on the Pittsburgh experimental cars, are mounted at each end of this sample car. Under each vestibule there is an Osgood-Bradley standard foot gong and a Westinghouse Air Brake Company "Pneuphonic" warning horn. The car is equipped with the Faraday buzzer passenger signal system.

Electric heaters are Gold inclosed element type, with thermostat control. There are sixteen heaters in the body of the car; twelve under the cross seats, and four panel type mounted in the risers of the longitudinal seats. Each vestibule also has two electric heaters, one in the face of the equipment cabinet and the other in the recess in the cabinet for the operator's knees. These vestibule heaters are not controlled by the thermostat but are connected to a two-point switch so that one or both may be turned on or off as desired.

Lamps in the car body are arranged in two rows of Electric Service Supplies Company No. 1022 dome fixtures, eight on each side. Two similar fixtures, one over each step, are located in each vestibule. These lamp fixtures are all wired in series, each taking one 30-volt, 1-amp., A-19 bulb. An automatic cut-out device is part of the fixture equipment so that if any one lamp in the circuit burns out the other lamps continue to burn at normal voltage and the defective lamp can thus be identified readily and replaced. Two lamps are located in each destination sign box. These are in one circuit with the headlights and there is a three-way switch arranged so that the headlight at either end of the car may be operated as desired. The headlights are of a special shallow Crouse-Hinds design equipped with special reflectors and automobile-type lenses.

At each end of the car a stop light is controlled by the air brakes so that whenever the brakes are applied the lights at both ends are illuminated to notify an approaching vehicle from either direction that the car is either about to stop or has already stopped and may discharge passengers. Provision is made for any type of fare or transfer register equipment. If the cord-operated type is used, a special duct is built into the body so that the cord is not visible except where it extends through the vestibule finish. On the sample car, this cord extends down through the sign box where it is within convenient reach of the seated operator. Spring-mounted trolley base supports of the type described in the article on the Pittsburgh experimental cars in the June 2 issue are part of the equipment of this car.

Westinghouse Electric & Manufacturing Company

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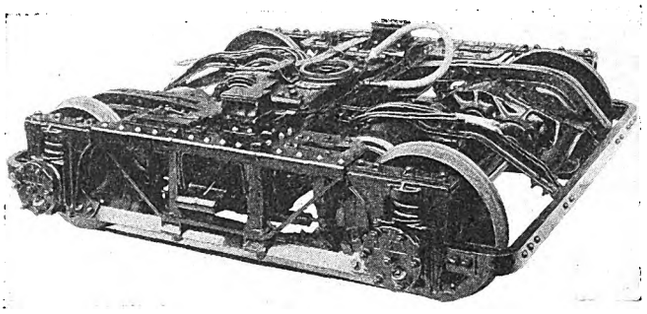
type HL electro-pneumatic, unit-switch control, with four 35-hp., 300-volt, light-weight, high-speed motors connected in series in groups of two for operation on 600 volts, comprises the electrical equipment. The electro-pneumatic switch units are mounted underneath the car body. Instead of the customary storage battery for operation of the control switches, this equipment utilizes trolley voltage through a resistance element. Wherever possible all control cables are carried in a wiring box inside the car body, and all wiring throughout the car has been installed to meet the requirements of the National Board of Fire Underwriters. The car carries their inspection plate.

Full safety car air brake equipment, with a Westinghouse variable load adjustment, is used. The usual foundation brake rigging and brake cylinder have, however, been eliminated. Air pressure is carried directly to each truck wheel through eight Westinghouse automotive type diaphragm brake chambers, the only brake connection between the car body and the trucks being through a flexible hose used to transmit the air pressure to the brake chambers. Better equalization, simplified brake rigging, and a considerable reduction in weight and maintenance are expected from this arrangement. The general scheme is similar to that used on one of the Pittsburgh experimental cars and described in detail in the June 2 issue of the JOURNAL. Air-brake pipe, wherever possible, is located inside the car body and consists of aluminum and copper tubing except for a small amount of standard iron pipe. The use of the tubing not only reduces weight but obviates the need for elbows and other pipe fittings and eliminates trouble from rust and scale.

Most of the valves and control devices in the brake system are grouped in a special equipment box under the car, which has an electric heater to prevent freezing. These several air devices are mounted on a removable tray in the box, below which are the heating units. Special electrical connectors are used for all wiring into the box, and air lines are all brought into unions on the outside, where they are within convenient reach. By disconnecting these unions and electrical connections, the entire valve group may be removed from the box for inspection, repair or cleaning.



An unusual feature of this special Osgood-Bradley truck is the use of automotive brake diaphragms at each wheel. High-speed Westinghouse motors are coupled with W-N drive to the 22-in. diameter wheels

A valuable sequel to the recent Detroit Survey and the Dayton Survey in this issue will be the presentation next week of the

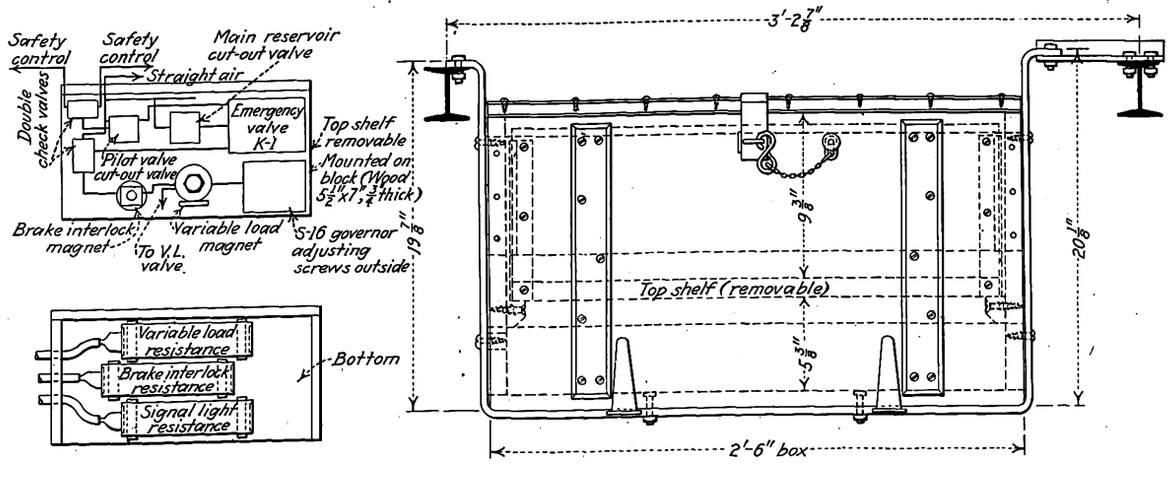
STREET TRAFFIC CONTROL PROBLEM OF SAN FRANCISCO

Every phase of the problem was covered under the directorship of

DR. MILLER MCCLINTOCK

Director Albert Russel Erskine Bureau
Harvard University

The trucks under this car are similar to the Osgood-Bradley 45-66-KDA-50 trucks with Westinghouse-Nuttall double-reduction drive, used under one of the Pittsburgh experimental cars, except that these have Westinghouse 35-hp. high-speed motors and 22-in. diameter wheels instead of the 50-hp. motors and 24-in. wheels used under the Pittsburgh car. The trucks are of the truss frame, spring pedestal type, with coiled springs over the Hyatt roller bearing journal boxes, and with conventional, double-elliptic, spring-supported, swing type bolsters with damper attachment. The brake arrangement, as previously mentioned, is similar to that on the Pittsburgh car, in which the diaphragm type brake chambers at each wheel actuate the individual truck levers. In this way all truck levers are live levers, the connection between each pair on each side of the truck consisting of a specially designed Anderson slack adjuster.



Air valves and other apparatus are mounted in a special equipment box under the car, on a tray which can be easily removed for inspection of the entire group

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Dayton Should Pay Higher Fares

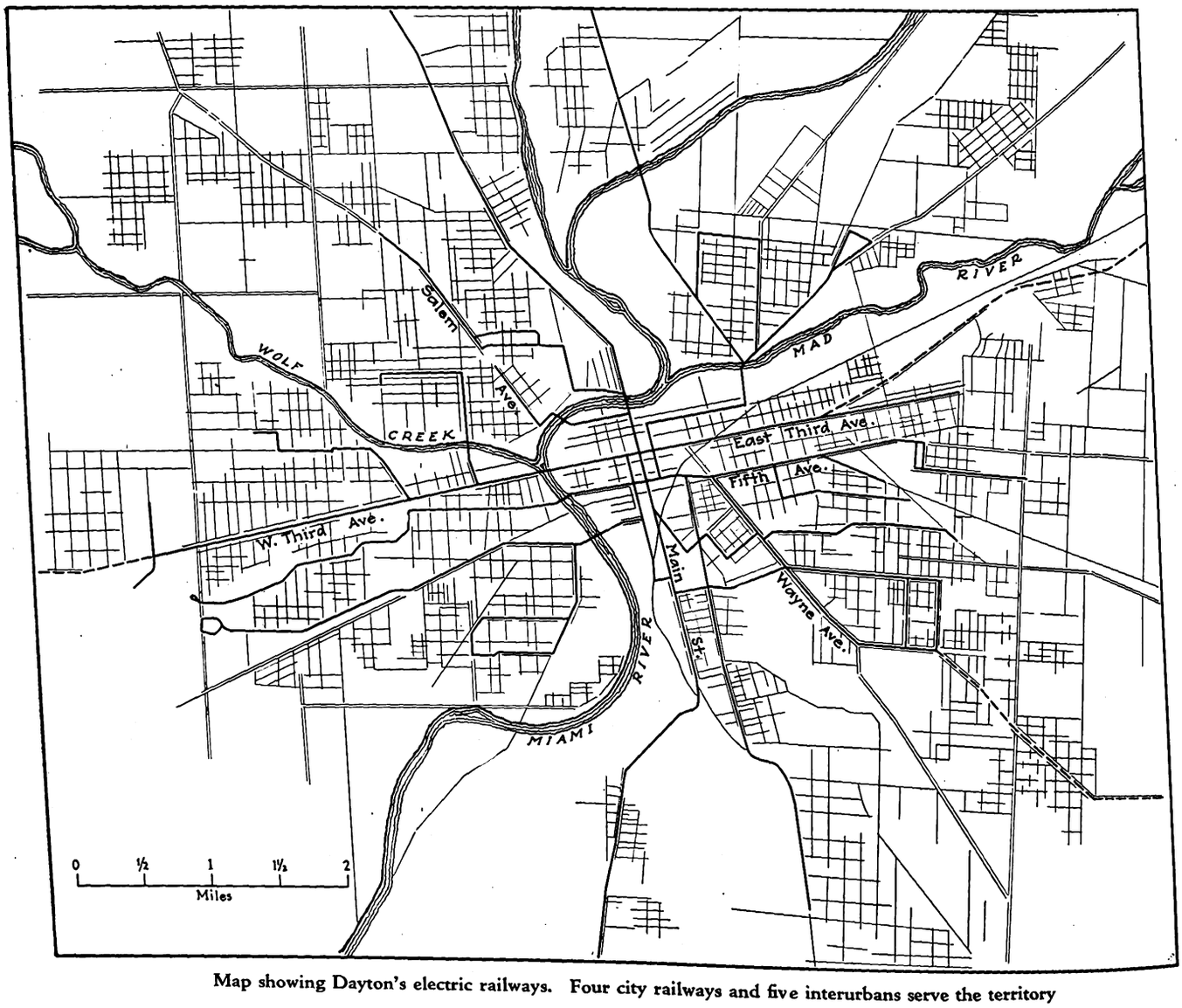
This conclusion was reached by Ross W. Harris after an extended survey. His report discusses means for relieving traffic congestion and for measuring street railway track capacity and service

DAYTON has grown from a population of 61,220 people in 1890 to 184,406 in 1927. With adjacent suburbs its population in 1927 was 194,161. It is located in the midst of a rich agricultural district and industrially is highly developed. The downtown district has spacious streets and is level. The city is an important railroad center and is intersected by the Great Miami River. The industries are not confined to certain districts as in most other industrial centers. They are scattered throughout the city.

At the request of the city manager of Dayton, the four street railway companies providing urban service in the city and the five interurban electric railways connecting it with other cities, Ross W. Harris of Madison, Wis., has been engaged in making an extended survey of the vehicular and street railway traffic situation in Dayton. It has recently been completed after nine months' work, and a report was filed with the City Commission May 1. Briefly, Mr. Harris' recommendations follow:

For general traffic, he recommends restricted parking on many streets, shortening of the traffic signal cycle, and encouragement of the construction of private parking garages immediately outside the main business section.

For the street railways, he recommends increased size of safety zones for boarding and leaving passengers, an increased fare to place the companies on a sound financial



Map showing Dayton's electric railways. Four city railways and five interurbans serve the territory

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basis and permit improved service, a revision of the requirements upon the companies for paving, a reduction in the number of service stops, an increase in the number of turnbacks, installation of more electric track switches, and if possible, some corporate arrangement between the several companies supplying the city service by which there should be unified co-operative service through an operating clearing house. Earnings would then be distributed according to some equitable plan. Mr. Harris points out that such an arrangement might develop later into a service-at-cost agreement between these electric railways and the city.

Eliminating Grade Crossings

Progress is being made in the matter of grade separation in Dayton, and Mr. Harris says that the question will soon have to be settled as to the extent to which the electric railways should contribute to the city's portion of this expense, namely, 35 per cent of the cost. While he admits that the electric railways, like all other interests, will benefit by the change, they will also be put to considerable expense in the relocation and reconstruction of their tracks and in providing temporary facilities during the work of grade separation. This should be considered. On division of expense, he suggests:

In general, the cost should be divided in proportion to the relative width and use of the street car strip and the balance of the street. As the railway strip is used jointly by the automobile and street car, the exact basis of division as to its use should be determined by the number of cars passing and the number of vehicles passing within a normal day, giving a weight of ten to each street car and one to each vehicle. The total cost so determined, however, should not exceed a fair amount based on the net benefits to the electric railways, after an allowance has been made for the additional cost occasioned to them by the construction of grade separation facilities. It should be remembered, also, that the railways pay a general tax like the other interests or individuals, out of which the city's portion of 35 per cent will be paid. An approximate appraisal of the net benefits to the electric railways from this change has been made. It was found that the amount chargeable against the electric railways should not exceed $1,400 per year for ten years for a single electric railway track at the intersection, and $2,800 for two tracks.

An abstract of Mr. Harris' detailed treatment of Dayton's transportation problem is of particular interest to operators in other cities owing to the possibility of applying in their localities the remedies suggested for Dayton. The remainder of this article will therefore be given up to an abstract of those portions of the report.

The Parking Problem in Dayton

Public investment in the improvement of streets has been primarily for the accommodation of moving traffic. The extent to which the streets should provide storage space for automobiles depends on what is the greatest benefit to the public. While, superficially, the parking of automobiles in front of a certain store may seem advantageous to the particular merchant, yet such private gains, if any, from this source, may react against his interest by increasing congestion and creating a measure of inaccessibility, thus encouraging the development of business elsewhere in more easily accessible locations.

A count at 10 a.m. on Aug. 4, 1927, showed 1,651 automobiles parked within the area bounded by Monument Avenue, St. Clair Street, Pitt Street and Wilkins Street (the business district). This number is 4 per cent of the total passenger automobiles licensed in Dayton. At 2 p.m. and 5 p.m., 3.9 per cent and 3.7 per cent, respectively, were parked in this area.

Even now the general street congestion caused by parking in the downtown area, and the continued movement into and out of the parking spaces there, is so serious that steps should be taken to relieve the situation. Parking should be prohibited on certain streets between 7 a.m. and 7 p.m. on all days except Sundays and holidays. It should also be prohibited between safety zones and curbs or within the 25 ft. next in rear of a safety zone and the curb. Diagonal parking should be permitted only on certain streets.

Many of the street railway safety zones in the downtown district should be extended so that they can accommodate at least three cars. The maximum length now is for two cars only.

Street Area Occupied by Automobile and Street Car Riders

In Dayton the average automobile, when still, occupies 133.76 sq.ft., including an allowance of 1 ft. on each side and 1.5 ft. front and rear for clearances. The average number of passengers per automobile, determined by count, is 1.56. This amounts to an average of 85.8 sq.ft. of street area per auto passenger.

The Dayton street car, when still, occupies an average of 458.54 sq.ft., including an allowance of 1 ft. on each side and 2.5 ft. front and rear for clearance. During the evening rush the average load per hour for all cars outbound, past the point of maximum loading, is 49.8 passengers. Thus the average still area required per passenger is 9.2 sq.ft.

With an additional allowance of 20 ft. per auto for safe spacing when running at a reasonable speed, 183.2 sq.ft. of street space is required per passenger. To serve the average street car load of 49.8 passengers, the automobile would require 563.2 lin.ft. of street when still, and 1,203.2 ft. when running. The average length of the Dayton closed street car over all is 40.4 ft.

A four-day check was made of the patrons of four leading retail stores on Jan. 9-12, 1928, to determine the means of transit used by them in reaching the stores. The results follow:

7,466	customers or	28 per cent used automobiles.
14,287	customers or	54 per cent used street cars.
4,148	customers or	15 per cent walked.
164	customers or	1 per cent came by interurban cars.
556	customers or	2 per cent came by bus.
118	customers or	0 per cent came by miscellaneous means.
26,739		100

Speed and Service of Dayton Street Railways

The average annual speed in miles per hour in Dayton of the City Railway, Peoples' Railway, Oakwood Street Railway, and Dayton Street Railway for 1922 to 1926, inclusive, has been compiled. In 1922 the figure was 9.04 m.p.h. In 1926 it was 8.66 m.p.h. The corresponding speed in Memphis is about 10.3 m.p.h. As the tendency in Dayton has been downward in recent years, special effort should be made to permit faster speed. An average speed of slightly better than 10 m.p.h. is attainable in Dayton, but this will require careful supervision of service by the company and constructive co-operation on the part of the city authorities.

Dayton street car riders receive 0.89 seats per outbound passenger during the heaviest hour of travel at the

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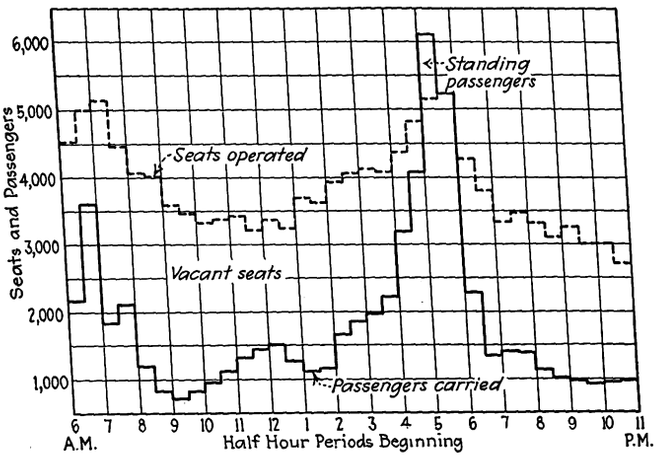


Seats and passengers when passing points of maximum loading on typical week day, Dayton city lines only

point of maximum loading, when the entire system is considered. From 9 a.m. to 2 p.m., the non-rush hours, the car riders receive 2.70 seats per passenger at points of maximum loading. This service fully equals that given in other cities the size of Dayton.

Duration of Signal Cycle in Downtown District

The traffic signals in the downtown district at present are synchronized and alternate, that is to say, signals will change at the same time at all corners, but where green shows in a certain direction at one intersection, red shows in the same direction at the next intersection. The duration of one cycle is as follows: green (north and south), twenty-one seconds; amber, five seconds; red, twenty seconds; amber, five seconds; total 51 seconds.

This period does not synchronize well with the speed of pedestrians, street cars or automobiles, so that their through movement cannot be continuous. Observations showed that their average speeds in the downtown districts were: Pedestrians 3.05 m.p.h.; street cars 4.04 m.p.h.; automobiles 15 m.p.h. The length of the signal cycle should be determined for one of these means of travel, with the speeds of the others bearing a definite relation to it. Thus, on the basis of figures quoted, the time allotted to the street cars to pass between two intersections should be five times the total of one red and one amber light, and for the average speed of the pedestrian seven times. The duration of the cycle for an automobile should be twice the time required by it to travel from one intersection to the next. If an automobile requires eighteen seconds to travel the length of the average block in the downtown district (508.3 ft.), 36 seconds is the proper duration of a cycle properly to fit automobile traffic. This establishes 90 seconds and 126 seconds as the time required for street cars and pedestrians to travel the same distance at their respective speeds. The 36-second cycle would then be made up: Green, fourteen seconds; amber, four seconds; red, fourteen seconds; amber, four seconds. Observation of the time required for the average pedestrian to cross intersections between curbs in the downtown district is 14.5 seconds. As he can use the duration of one green and one amber signal, he would have eighteen seconds to clear the intersection.

It may be suggested that a short signal cycle might be satisfactory for light traffic and unsatisfactory for heavy traffic. This is true theoretically. Practically, however, the longer cycle is of but little additional advantage to heavy traffic, and makes much less efficient use of street capacity.

Characteristic Zones of Travel

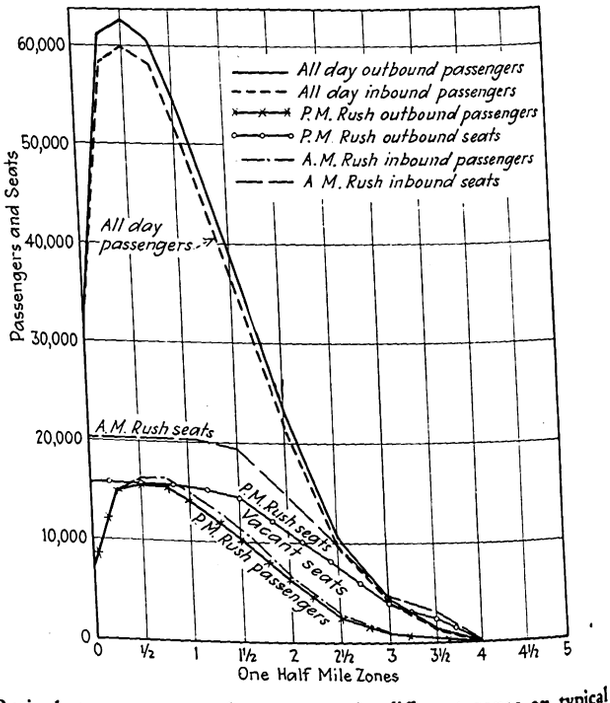
Every route from the center of the city of Dayton into its outlying districts has three distinct zones; a central zone, a transmission or neutral zone, and an outer zone. The central zone is located in the downtown business district. The transmission, or neutral zone, is just beyond the central zone and most passengers ride completely through it. It contributes less revenue than the other zones, and in it, during the peak hours of travel, there are usually more passengers than seats. The outer zone includes the residential district. Most of the rush-hour vacant seat-miles are found in this zone.

An accompanying chart shows the ratio of passengers and seats for all city lines in Dayton. Another gives the seat distribution by half-hour periods for week-day service.

An analysis of the data relating to standing passengers and vacant seats in Dayton during 1927 shows there are 15.28 vacant seat-miles for each standing passenger-mile. This is a large proportion.

It was also found that the average passenger ride is 1.83 miles, which is approximately equal to 54 per cent of the average one-way car trip.

Free movement of cars requires that the time spacings between consecutive cars be not less than the average length of service stop. The average service stop in the Dayton downtown district is 36.75 seconds with traffic signals and 22.69 seconds without traffic signals. With this figure, an assumed rate for acceleration and braking of 1.5 m.p.h.p.s. and at least 5 ft. of free space between cars when standing on main-line track, the normal carrying capacity of track in the downtown district in Dayton can be calculated. It must be borne in mind, however, that such a calculation assumes that there will be no interference with the free movement of cars from sources other than those involved in the length of service stop and factor of safety. If the track between consecutive



Ratio between seats and passengers in different zones on typical week day, city lines only

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cars is used by vehicles, for example, the extent to which the full theoretical track capacity may be utilized is materially affected.

Car Seating Capacity

The seating capacities of the various city cars in Dayton range from 28 to 70, depending on the type. In all, there are 27 types of cars and, with but a few exceptions, they are one-man cars. They average 47 seats each. Observations of the average normal standing load, which may be taken as 22 passengers, show that they will arrange themselves on city cars under average conditions as follows:

Average Area per Standing Passenger (Normal Standing Load)	
Front vestibule	One passenger for each 3.30 sq.ft.
Aisle	One passenger for each 4.01 sq.ft.
Rear vestibule	One passenger for each 5.94 sq.ft.
Car as a whole	One passenger for each 4.08 sq.ft.

The minimum space per passenger observed at various times under voluntary election of standing space in different crowded cars was as follows:

Average Area per Standing Passenger (Crowded Cars)	
Front vestibule	One passenger for each 1.03 sq.ft.
Aisle	One passenger for each 1.47 sq.ft.
Rear vestibule	One passenger for each 1.08 sq.ft.
Car as a whole	One passenger for each 1.50 sq.ft.

The average city car has 86.9 sq.ft. available for standing passengers, and on the basis of 1.5 sq.ft. per passenger, will accommodate 58 standing passengers in an emergency, or 123 per cent of its average seating capacity.

Unit for Measuring Service

No one unit for measuring service in all its phases has been devised. Many have been suggested, but they are not entirely adequate. On the basis of pure transportation, however, the unit "Car-Mile Per Revenue Passenger" may be used. Actually, this has been decreasing in Dayton, as shown by the table on page 1030, representing the car-miles per revenue passenger on the Dayton city lines of the City Railway, Oakwood Street Railway, Dayton-Xenia Railway, Peoples' Railway, Dayton Street Railway and Cincinnati, Hamilton & Dayton Railway.

A car rider has a right to expect satisfactory service, but it is difficult to decide what service is satisfactory. Some may want speed, others reliability, others vacant seats, or it may be that property or business interests may be the deciding factor.

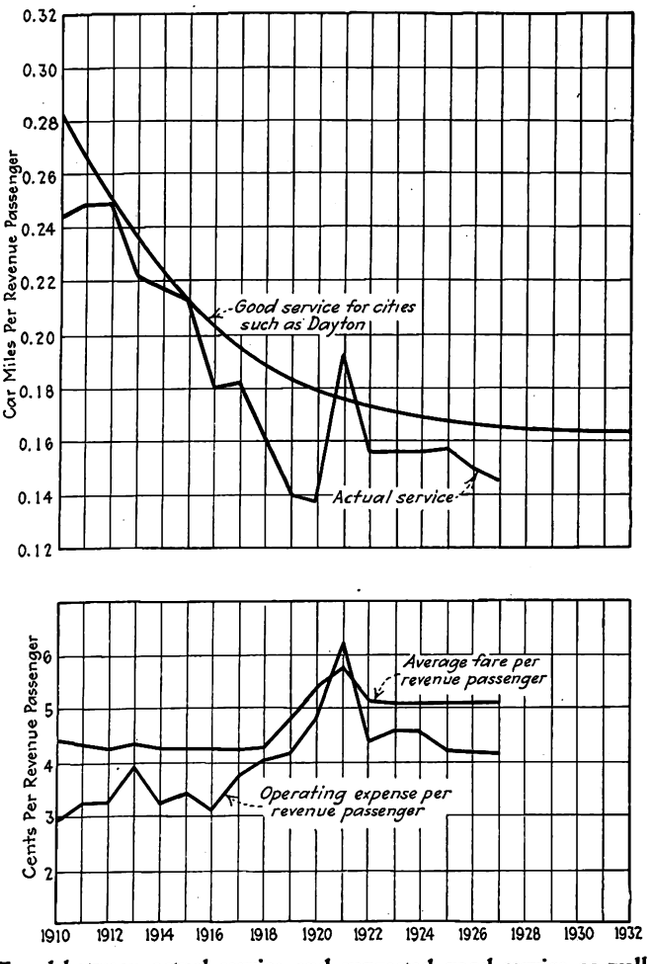
Attempts have been made to establish a standard of service based on an average load or the number of seats per 100 passengers over a given period of time. These efforts have not proved successful because they are not conducive to efficient operation nor do they guarantee an equitable relation between service, fare and cost.

A standard of service based in such a way as to maintain an equitable relation between revenue and cost could be developed somewhat as follows: Estimate the future revenue for several months, preferably a year; then deduct an amount required to maintain the integrity of the money invested, i.e., return, renewals and replacements, maintenance, and a small margin for profit and loss. The balance, after deducting an amount to cover taxes, comprises all the money which is available for service.

Next, determine the aggregate mileage that this amount of money will pay for at the prevailing rate of cost, then distribute it to the various months according to seasonal conditions and requirements; then to the various routes, and then to the various days of the month. Then, from somewhat similar estimates of earnings for each route a continued measure of service may be evolved in the form of "Earnings Per Car-Mile" by lines for each month and each day. Such a standard may be designated "Daily Line Standard."

Division of the earnings in service of each of the routes by the unit "Earnings Per Car-Mile" will then give the largest amount of mileage which should be operated on a given date. With this determined, the next problem is to distribute this mileage along the line and throughout the day. This is a matter of schedule design.

A diagram included in the report gives the car-miles per revenue passenger since 1910 for the City Railway, Peoples' Railway, Oakwood Street Railway and Dayton Street Railway. Other companies rendering city service were not included because a complete separation of operating expenses between their city and interurban services was not available.



Trend between actual service and suggested good service as well as between expenses and fare per passenger, Dayton city lines only

The curve representing good service is drawn in as a matter of judgment. The actual service is below this curve except in 1921, when there were abnormal conditions, due to a strike. The lower curve shows that during these years there was only a narrow margin between operating costs per revenue passenger and the fare. This margin was too small to be conducive to rendering good service. As a result, the city as a whole paid through a reduction of service below normal good service.

If the proposed standard should be adopted, it is believed that it would distribute service equitably and give

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to the public all the service a given fare will permit, and to the company assurance that the integrity of its investment will be protected. All of this lends itself to furthering the development of the community.

With such an arrangement there should also be a limit to the size of load to be carried. Thus, subject to the limitations of service already discussed, the loads carried past the point of maximum loading, averaged over a period of twenty minutes, should not regularly exceed the normal capacity of the car, or seating capacity plus one standing passenger for each 4 sq.ft. of standing area. Further, no regularly occurring maximum load should exceed the emergency capacity of the car, which is seated capacity, plus one passenger for each 1.5 sq.ft. of available standing area.

The fare required in Dayton to provide good service there under present operating conditions can be determined as follows:

AVERAGE FARE PER REVENUE PASSENGER REQUIRED TO PROVIDE GOOD SERVICE IN DAYTON UNDER PRESENT CONDITIONS

Average length of one-way car trip, miles	5.43
Operating expenses per car-mile in cents (normal for Dayton)	21.7
Operating expenses per one-way car trip	$1.1783
Ratio of operating expenses to gross revenue, per cent	55.4
Gross revenue required	$2.1269
Car-miles per revenue passenger	0.1650
Revenue passengers per average one-way car trip	32.9091
Average fare required per revenue passenger in cents	6.46

This average fare could be obtained from the following rates.

Half-fare tickets	3 cents
Full-fare tickets	Four for 25 cents
Transient fare in cash	8 cents
Extra charge for transfers	1 cent

The division of these fares paid would probably be approximated as follows:

	Fare in Cents	Per Cent	Product
Half-fare tickets, no transfer	3	3.7	11.1
Half-fare tickets, with transfer	1	0.8	3.2
Four tickets for 25 cents, no transfer	6¼	70.0	437.5
Four tickets for 25 cents, with transfer	7¼	15.5	112.4
Cash fare, no transfer	8	8.2	65.6
Cash fare, with transfer	9	1.8	16.2
Total (average)	6.46	100.0	646.0

Increased operating expenses would change the fare required. Thus a 5 per cent increase in wages would make necessary an increase in receipts of 0.06 cent per revenue passenger, and a 10 per cent increase in wages would mean a necessary increase of 0.13 cent per revenue passenger.

To insure adequate service to the public and ability to keep abreast of the city's development, new capital is constantly required for electric railway facilities. Electric railway securities should be made as attractive as other corresponding forms of investment, both for income and security. Certain rules have been set down which, if complied with, will establish the electric railway securities of Dayton on a proper basis. Briefly, these rules are:

1. Net earnings should not be less than 2.5 times fixed charges.

2. Fixed charges should not be greater than 4.24 per cent of rate base (or amount on which the company is allowed to earn a return).

3. Fixed charges should not be greater than 16.112 per cent of gross revenue from all sources.

SERVICE: CAR-MILES PER REVENUE PASSENGER, ON DAYTON CITY LINES OF CITY RAILWAY., OAKWOOD STREET RAILWAY, DAYTON-XENIA RAILWAY, PEOPLES RAILWAY, DAYTON STREET RAILWAY, AND CINCINNATI, HAMILTON & DAYTON RAILWAY

Year	Car-Miles	Revenue Passengers	Car-Miles per Revenue Passenger
1910	7,372,408	30,041,325	0.2454
1912	7,849,434	30,848,534	0.2544
1914	7,532,742	33,441,835	0.2252
1916	7,447,799	39,503,027	0.1885
1918	6,878,142	41,568,427	0.1655
1920	6,376,661	44,933,105	0.1419
1922	6,767,156	42,697,635	0.1585
1924	6,884,446	43,227,938	0.1593
1926	6,830,366	44,438,428	0.1537
1927*	3,430,400	22,981,478	0.1493

*Estimate for first six months.

4. Net earnings should not be less than 40.28 per cent of gross revenue from all sources.

5. Face value of bonds should not exceed 6.667 times net earnings.

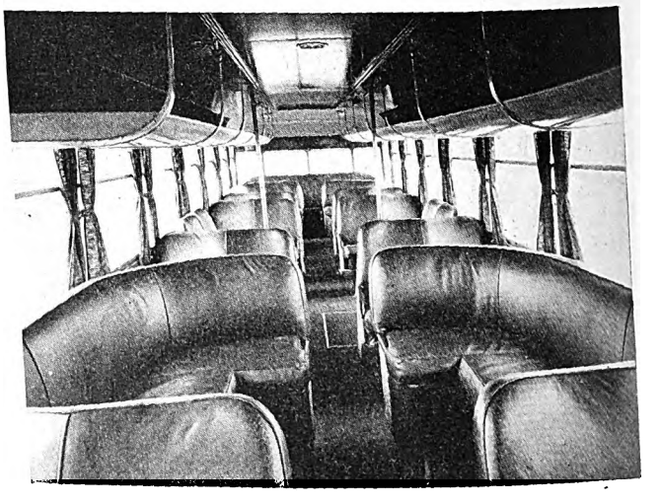
6. Face value of bonds should not exceed 2.6853 times gross revenue from all sources.

7. Face value of bonds should not exceed 70.6658 per cent of rate base.

In the above, net earnings are taken to be gross revenues, less operating expenses and taxes; gross revenues mean revenues from all sources; fixed charges equal annual interest charges or bonds; rate base is the recognized amount on which a return is allowed to be earned. In this method of calculation prudent management and sustained earnings are assumed.

Under present conditions a full compliance with rule 4 is not probable for any of the companies in Dayton, except by greatly reduced operating expenses. With that exception they come through with a pretty clean slate.

New Bus Seating Plan



Seats over the wheel housings in this Twin Coach are a departure from the ordinary type

SEATS over the wheel housings of buses ordinarily are of little utility. F. C. Miller, manager of the Cleveland-Akron-Canton Bus Company, has devised an arrangement to obviate the difficulty and seats of his design are installed in the six Twin Coaches just put in service on the Cleveland-Akron-Canton run. The seats directly over the housing are longitudinal, and are combined with transverse seats immediately behind. A continuous padded back sweeps in a quadrant behind the seats, as shown in the illustration. The plan has increased the total capacity of the coach from 37 to 40 passengers.

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Are We Merely Running Cars?

Modern standards of public transportation must be created to meet the relentless pressure for improved facilities. Readjustment in thinking, planning and managing can retain the position of prosperous leadership for each management

By E. J. McIlraith
Staff Engineer Chicago Surface Lines, Chicago, Ill.

Speaking at the recent annual convention of the Canadian Electric Railway Association, Mr. McIlraith brought out that the railway business is in a state of change and that to meet the present-day competition a complete readjustment is necessary. As a foundation for planning and supervising a readjustment he listed and discussed fourteen items that hold many possibilities for individual operators.—EDITOR.

PUBLIC transportation is necessary in all cities and some organization must operate each system, but the relentless pressure of the last ten years for improved facilities is not slackening. There is no chance of dodging the issue. Each management is being forced to the defensive and only the active, aggressive and progressive will survive. The railway business is in a state of change, and only readjustment in methods, in modernization of equipment, in thinking, planning and managing can retain for each management the position of prosperous leadership.

All business customs and procedure are changing. As Merle Thorpe says, in The *Nation's Business* for April:

> Change is the immutable law. Eternal adaptability is the price of survival. Competition and change march together as one.
>
> Together they plan new things to supplant old things, to dominate new markets, and to wrest the patronage from old-time customers and customs. Together they see to it that a commercial house of a century's standing may be destroyed with bewildering suddenness. At the same time an infant enterprise becomes overnight a national institution. . . .
>
> Competition never rests. Competition may be the life of trade but it is also the death of traders. . . .
>
> Out of the flux and ferment emerge the victors. Men clear-eyed, alert, resourceful, they win that all of us may live more fully. It is the law.
>
> The world steps aside to let any man pass who can see a year ahead.

Railways are no exception to this general rule. Present-day standards must be served. The public should be surprised by a better quality and comfort of public service than it has yet grown to want.

The purchaser doesn't buy merely what is necessary any more; he is sold something better, bigger and more luxurious than he had wanted. He cheerfully pays for newer, better automobiles, lives in newer, better homes, wears more expensive clothes, changes even his furniture to suit the prevailing vogue. But the electric railways are not modernized in sales practices. The people are not even getting what they timidly hope for; much less are they surprised by what is offered.

Here and there someone is showing either a new idea or a better adaptation of an old one. Scattered efforts are building for us the nucleus of the modernized scheme of transportation that will serve the public well. The alert management is searching for these, and will develop them so as to deserve public commendation and secure favorable operating conditions from the city government.

Many competent minds have been active in trying to determine the ultimate or best development for public transportation. It is idle to think now of some unexpected panacea or some drastically different development that will revolutionize our business. Electric railways will continue for an indefinitely long period to be the most effective form of public transportation. It does not follow that present electric railways are operating at their best. None even approaches a condition which might be considered completely satisfactory, and most of them are very far short of the standard. Successful management and operation call for intimate attention to much detail and great improvement on many existing practices. Circumstances often prevent the attainment of the management's dreams. Often the obstacles are more fancied than real. Often the ideal set is far short of being appropriate to the circumstances. But whatever the condition and in all circumstances, the quality of the service and the success of the business is a direct measure of the ability of the management to follow through in planning and in supervising, so as to insure intelligent and competent attention to all the details involved.

There are a few outstanding items that are being done here and there and that should be given complete attention by each property. These fourteen items may serve as a foundation:

1. Traffic regulation and improvement of street use.
2. Promoting an active, competent committee of representatives of influential and interested industries or organizations to study and develop planning for street betterments.
3. Reducing time wastage in operation.
4. Building appropriate comfort into cars.
5. Building high-powered cars.
6. Building attractive cars.
7. Building high-grade machinery principles into the car equipment.
8. Scheduling service that is suited to the different districts served.
9. Providing express service by suitable buses.
10. Using well the possible auxiliary equipment such as buses of various types, or trackless trolleys.
11. Scheduling service with thorough technical skill after careful analysis of the necessary traffic data.
12. Thorough training of the operating force in good principles of safe, and yet fast, operation.

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13. Active and effective supervision of the operation to insure performance of the standard set.
14. Planning for better and bigger city growth.

A brief discussion of some of these items will illustrate the possibilities.

Regulation of Traffic Requires Co-operation

Traffic regulation in its broadest sense is a definite problem on which railway managements should be the best informed specialists and most effective workers. It involves not only signal control and traffic routing or segregation, but also all the basic principles of street use such as proper regulation of all movements, parking, street obstructions (including manhole openings and street repairs), routing of cars or buses, operation of taxicabs or sightseeing buses, loading or unloading of goods or materials, operation of service vehicles and the creation of special streets, boulevards and heavy traffic thoroughfares.

Traffic planning of this sort is not a police job, nor one for consulting engineers alone. The local organizations should be intelligently led through a study of the details so as to create traffic conditions that are appropriate to the best public welfare. Full sympathy can be obtained from all interested business organizations if the data are carefully collected, are thoroughly discussed and the conclusions reached are based on what is clearly for the greatest good to the greatest number. The notable success in the development of traffic regulation in Chicago has been due to the complete understanding reached in the street traffic committee of the Association of Commerce.

Fast Operation Appreciated

Much time is wasted in ordinary street railway operation. Speed is a very essential element of good service and has much to do with the growth in business. Reckless speed is not wanted, but faster operation can be attained by reduction of delays to a minimum and by alertness on the part of the train crew. The Chicago Surface Lines is operating with an average speed of 11.26 m.p.h., in spite of the intensity of street use along car lines.

The failure to increase the average speed of operation is one of the major factors in preventing an increase in business in most cities. Our customers are severely critical of service that hints of inefficiency, but respond to an alert crew that hurries without rushing.

In order to maintain a high average speed it is necessary to have adequate motor capacity. High accelerating rate and high free running speed are needed if the street car is to compete successfully with any vehicle in the street. With the faster car the standard of service on a line can be maintained with a smaller number of cars and consequently a lower cost for housing, and the cost of operation in trainmen's hours also is reduced.

Comfortable and Attractive Cars Are Needed

Many railway organizations have been trying to build comfort into street cars and much has been accomplished, but all too slowly. Cars should be renovated more rapidly. Most of those now in use are a product of the age when people had to ride street cars. Managements should have moved faster in meeting the competition of comfortable seats in private automobiles. Public conveyances cannot be quite so comfortable, but there is too great a difference. The noise and rattle, insufficient ventilation, width of aisle, the width and convenience of the doors and platforms, and the method of using doors are all subject to severe criticism.

The new car on trial in St. Louis looks like a good type for most lines. It has individual seats arranged along the sides, each at an angle of about 45 deg. from the line of the side of the car. There are 43 seats and a very wide aisle. This arrangement affords unusual accessibility, prevents all jostling during non-rush hours, and enables each passenger to enjoy a degree of luxury and exclusive comfort not possible when two persons are crowded on one seat. The ordinary street car or bus subjects passengers to an undesirable degree of personal contact.

The attractiveness of the car too often has been largely overlooked in the desire to secure minimum maintenance cost; but the railway can well afford higher cost if by doing so it attracts riders. Only a few added riders will pay for the slight additional expense of providing pleasing interiors.

Some of the interiors exhibited at last year's American Electric Railway Association convention in Cleveland were surprising departures from the older types, and simplicity of arrangement may result in reduced costs of construction.

Possibilities with Special Service

In Detroit a so-called jitney service is operating. Bus service of both local and express type is also given by competing companies. It is very interesting to note the apparent demand for the comfort of the express jitney service and of satisfactory express bus service without concern as to price. There is no doubt that many people resent the jostling within a street car and are willing to pay a higher fare for specialized express service. Comfort and convenience are quite in demand, and will be paid for cheerfully at any rate in keeping with the comparative exclusiveness of the patronage. The possibilities of such auxiliary express service have been very incompletely explored to date, even though several cities are giving a few sample runs of this type.

A special division of a company's organization established to build up express service would make possible the elimination of much private automobile use and should fill a recognized need as an auxiliary of the public transportation business. No doubt this service can be made profitable, because it can be rendered only at the price and where the business can be done profitably. The use of buses as supplementary equipment offers broad possibilities.

Importance of Scheduling

The department handling the traffic and schedule analysis is responsible for the number of cars owned and operated, for the car-miles covered, and for the quality of service rendered. The operating schedules may include useless car mileage that is not apparent nor suspected. Much of the cost, therefore, of the electrical, of the way and of the equipment departments is controlled by the skill with which the schedule department does its work. The cost of trainmen's wages is usually greater than the cost of these three maintenance departments put together. The accuracy with which the schedules may be maintained on the street is dependent upon the care with which the schedule department has analyzed the problem, has established the running time and the standard of car loading, and has worked out the solution in car-hours of operation. The effectiveness of each car-hour schedule is controlled by the schedule maker.

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It is impossible to judge the quality of schedule making without intimate analysis of the detail. This is rarely discussed outside the schedule department, and in some cities not even the schedule makers are trained to interpret the problem. Too often schedule making is treated abstractly as a sort of puzzle. It is a very live problem involving the satisfaction of thousands of travelers, the living conditions of the trainmen and their families, as well as the development of income and most of the expense of the company. It is not a casual job for unsympathetic or less careful handling than that of the most skilled men. In fact, the prosperity of the company rests principally with the skill and ability of those in charge of the schedule and traffic department. Of course, the manager may be sufficiently active and so thoroughly informed as to provide for the schedule department the necessary judgment; but is sufficient recognition of the importance of scheduling really given?

Millions of dollars per year may be wasted in a large company without any suspicion being raised as to that waste. It is time more railway organizations were employing the highest technical skill to reorganize this most important planning and production department.

Training of the Operating Force

No matter how good scheduling may be, the result on the street will be disappointing unless the operating force is trained in sound principles of safe and fast operation. The safety organization, together with the regular trainmen's school force, can instruct the men in safe practices that provide alert efficiency in saving moments of needless delay. The training of the motorman and conductor and the use of care to get them working in sympathy with a sound, well-planned viewpoint is a major portion of the problem of obtaining higher speed and lower accident costs.

The supervisory force, including all from the superintendent of transportation through to the supervisors and starters, must be alert, active, well-organized and constantly applying pressure. They must have the respect and assistance of the train force. The trainmen must be well instructed in the details of their work, and like all human beings must be constantly followed up to see that they do that which is laid out for them. Irregularities in operation will develop. Effective methods must be produced to restore good service. The public must be assured of regularity of operation, regardless of the handicaps that come from operation in streets. The supervisory force must try to keep operation as closely as possible to the schedule, but in small or large emergencies the principal emphasis in adjusting cars to make up for delays should always be to provide the best possible service adjustments regardless of the inconvenience to the train crew or of the overtime pay required. A record for dependability of service and for care in avoiding delays and inconvenience to the public can produce the good will that is so invaluable.

Railway Management's Obligation in City Planning

There is an outstanding obligation upon the railway management to be planning long in advance for the growth and development of the city it serves. The pressure of the modern density of traffic on the streets is producing new ideas on city planning. The old theory of a beautiful city plan involving noble architecture and magnificent geometrical arrangement for streets is quite incomplete in meeting the actual needs for regional planning of a city's transportation and traffic system. A true plan involves much more. The Regional Plan of New York is building towards the establishment of correct, scientific investigation of the reasons for the present types of city growth and development, the purpose of cities and the desirable layout that will fit best with the true economics involved.

Predictions of the future cannot be made with absolute accuracy, but foresight will prepare a general plan that will be quite adaptable to the future, and can stabilize the growth of the city, the land values and the business prominence of the city, because it can provide for continuous convenience of accessibility. Cities must establish a confidence of sound management in order that industry and commerce may expand, or that new industry or more business organizations may be willing to locate within them.

The railway organization is involved to an unusual degree in this city planning work. It is involved also in the detailed day-by-day job of fitting regulation to the needs of the users of the city streets. The managements must take the broadest possible point of view in meeting these problems. By becoming thoroughly competent to take leadership, and then showing an absolute impartiality in point of view in working out the very best results for all users of the street, the railway management can produce tremendous benefits for the community it serves.

Most railway managements are working on what is equivalent to a service-at-cost plan, because of commission rule and commission control. The management is, then, in reality representing the people as an agent in providing for public use one of the major necessities of a city. It owes a definite obligation to serve in the most complete way the needs of these citizens. Nearly all patrons served use both automobiles and public carriers, and practically all of the citizens of the city are in some way directly benefited by street railway service, although some use street cars only occasionally. The elected representatives of the people are elected by only a small majority of voters and are holding office only for a short term. The railway management's responsibility is continuous. Its interest in the city welfare is more vital than that of the elected officials because of the continuous commercial responsibility. It is more critical because of the absolute necessity of providing a continuing facility that grows more and more essential to the life of the community. The railway management is, then, entitled to assume the position of the most interested spokesman and best qualified agent with an obligation to all those using the streets.

These outstanding obligations rest upon the railway management's shoulders: It must first put its own house in order by intimate attention to the details of its own business, so that city transportation may become of maximum service to the community, affording the highest possible degree of comfort. It must help control the traffic problems of the moment, which are frequently embarrassing, and it must assume a major part of the burden of the development of a city plan that will be appropriate to the best comfort and prosperity of the citizens.

Each of us should ask himself critically, whether he is doing his part towards leadership in his community. Are we merely running cars, or are we planning, thinking, developing and giving the best service that the conditions of our city will support?

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Instruction Panel Explains Treadle Door Operation

By J. W. Weir

Assistant to General Superintendent of Maintenance Kansas City Public Service Company, Kansas City, Mo.

INSTALLATION of rear door control equipment representing a departure from previous standards, necessitated the training and instructing of carhouse and shop employees of the Kansas City Public Service Company in its proper adjustment, inspection and maintenance. A "general order," or maintenance instruction bulletin, explaining the adjustment and maintenance of the equipment, was issued and a portable panel with the various units comprising the treadle control was built.

The panel was taken to each carhouse by a representative of the engineering department thoroughly familiar with the equipment, and the operation of each unit exp'ained to the workmen. The men were shown how the switches, valves, controls and other parts functioned, and how possible troubles could be cleared. Short circuits in wiring, poorly adjusted contactors, stuck valves and other troubles were duplicated on the panel.

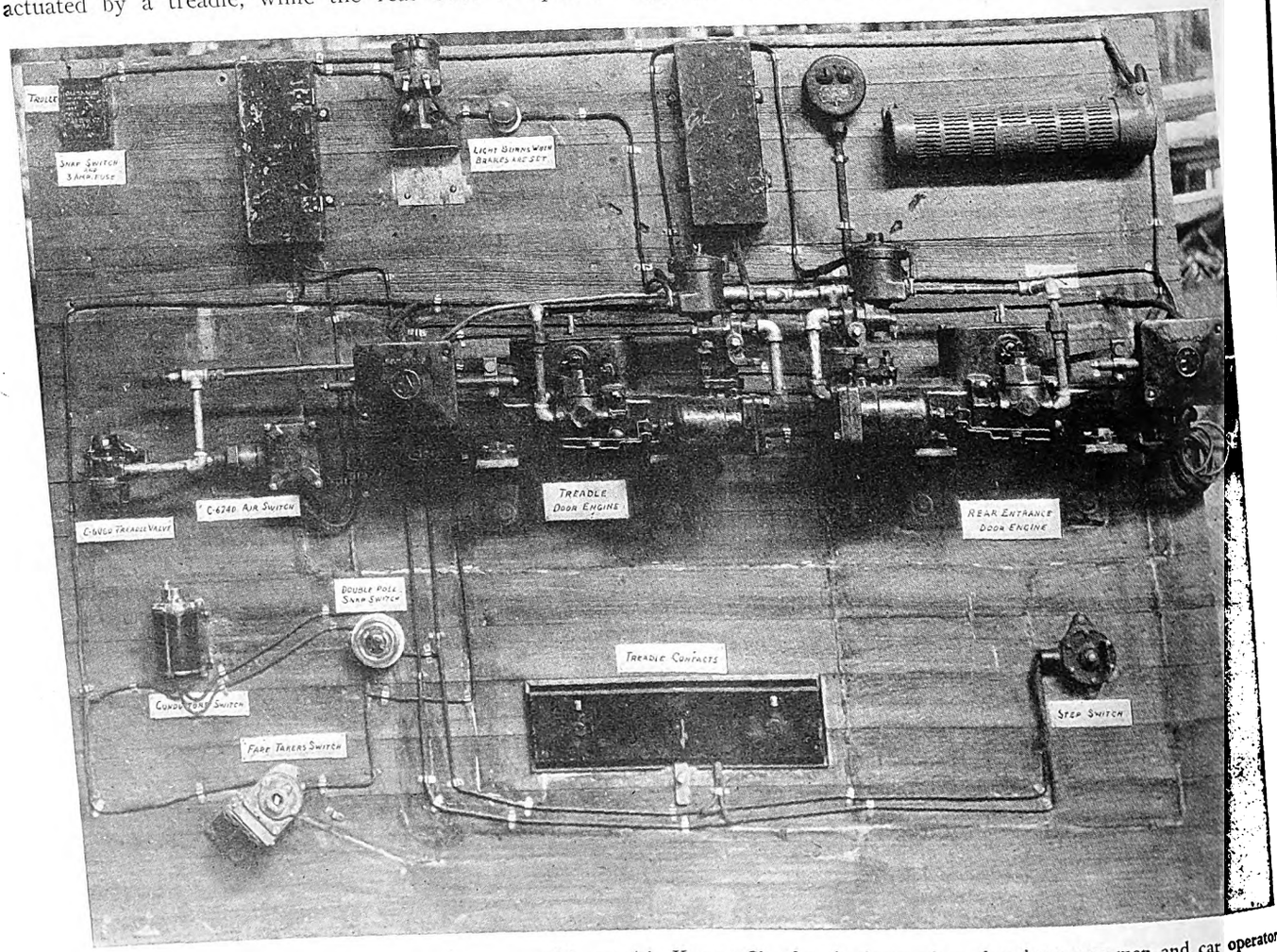
Kansas City will have 746 one-man cars when its rehabilitation program is completed, and of this number 621 will be equipped with special rear doors, electro-pneumatically operated. Two separate doors are used for the rear platform of each car, one for exit and the other for loading. The forward or exit door is actuated by a treadle, while the rear door is opened and closed by a street fare collector and is used for loading at points of heavy traffic. Since the cars also are designed for two-man operation, provision has been made for the control of both rear doors from the conductor's position. The switches used by the conductor and fare collector also are mounted on the panel.

The operator cannot release the treadle door until a predetermined pressure exists in the brake cylinder, and once the treadle door is opened the air brakes cannot be released until the door has closed. Also, if the rear doors for any reason are opened while the car is in motion, the brakes are immediately set with full reservoir air pressure.

Baltimore Employees Save $9,000

FIVE years ago the United Railways & Electric Company of Baltimore told its employees that if they would place their orders for domestic coal with it, they could get the benefit of the minimum rate for coal which the company is able to obtain by buying in large quantities and by paying cash. The employees are permitted to repay the company for their coal at the rate of 75 cents a ton each pay day until the account is settled.

On this basis, employees have been purchasing each year from 6,000 to 8,000 tons of coal. The coal purchased for the winter which has just passed amounted to 7,800 tons, and for the previous winter 8,189 tons. On the basis of the 25 cents cash discount per ton which the company gets and passes on to its employees, their aggregate saving during the five years has been $9,140.50.



Treadle door control units are mounted on a portable panel in Kansas City for the instruction of maintenance men and car operators

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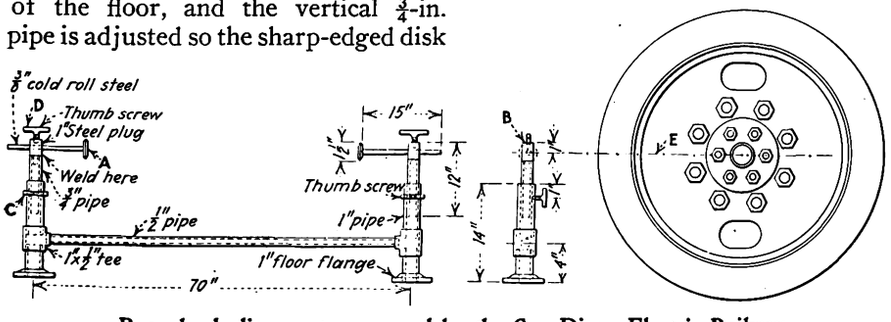
Maintenance Methods and Devices

Bus Wheel Aligning Gage*

By Charles Herms
General Foreman San Diego Electric Railway, San Diego, Cal.

WHEELS of the San Diego Electric Railway's buses are aligned by the gage shown in the accompanying sketch. This was built of odds and ends of pipe and fittings in the shops. Previously a standard alignment gage was used, but it was found unsatisfactory.

To check the bus front wheels they first are jacked up until they are clear of the floor, and the vertical ¾-in. pipe is adjusted so the sharp-edged disk



Bus wheel alignment gage used by the San Diego Electric Railway

A is even with the wheel center line *E*. The disk *A* should then be adjusted until it strikes the tire as near the center of the tread as possible. The disk *A* is mounted firmly on the ⅜-in. cold rolled steel rod. With the disk bearing lightly against the tire the latter is revolved slowly. When a complete revolution has been made a dark line will be noticed on the periphery of the tire tread. Sometimes it is necessary to chalk the treads in order to get a clear mark.

The next checking is with the wheels lowered so that they support the bus weight as in normal operation. The disks *A* are readjusted until they register with the marks on the treads of the two wheels. By tightening the thumb screws securely, and without moving the wheels, the gage is taken to the rear side of the front wheels and registered with the marks on the tire. By measuring the variation between the opposite disk and the mark on the tire an indication as to the correctness of the wheel gage is obtained. If the marks are closer together than the setting of the gage it indicates that the wheels are toed out and should be readjusted. This can be done by adjusting the cross-carrier rod wheels.

Wheels should always toe in, and the correct setting is between ⅛ and ¼ in. toe-in on practically all types of buses. It is safe to assume that the first ⅛ in. toe-in in excess of ¼ in. will decrease the tire life by 5 per cent; ¼ in. excess will decrease the tire life 20 per cent. An excess of ⅜ in. will decrease the tire life 40 per cent, and anything over that will cause all kinds of complications. Experience has shown that the best way to check wheel alignment accurately is to make the measurements directly on the tread and as near as possible at the center line of the wheel.

Submitted in Electric Railway Journal Prize Contest.

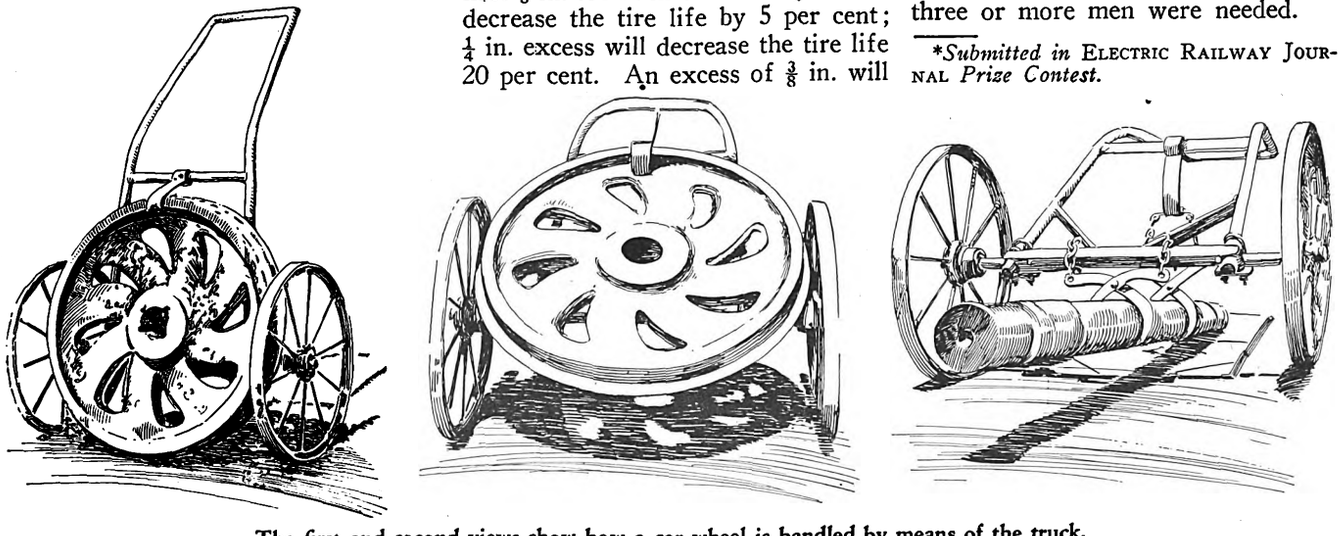
Truck for Handling Car Wheels and Axles*

By Ed. C. Kelly
Shop Foreman Eastern Division, Virginia Public Service Company, Hampton, Va.

PARTICULAR value attaches to a small truck for handling car wheels or axles in the shops of the Virginia Public Service Company, Hampton, Va. The usual method of rolling wheels on the flange requires considerable skill and is sometimes attended with danger or injury to the worker. This has been eliminated and the time of handling has been reduced greatly through the use of the truck. The wheels of the truck are mounted wide enough to straddle a car wheel. When the handle is raised the lower member of the frame engages the hub of the wheel to be handled and a hook from the upper member is placed over the rim. With the handle in its lower position the wheel is drawn upward and rests in a balanced position so that very little effort is required to push the truck.

With the addition of tongs or hooks as shown in one of the accompanying illustrations a man can handle axles very easily. Previously, three or more men were needed.

Submitted in Electric Railway Journal Prize Contest.



The first and second views show how a car wheel is handled by means of the truck, while in the third view a car axle is in position

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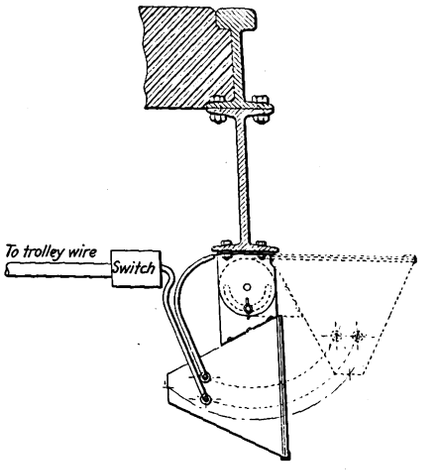
Adjustable Pit Light*

By H. S. Williams
Assistant Superintendent of Equipment Department of Street Railways, Detroit, Mich.

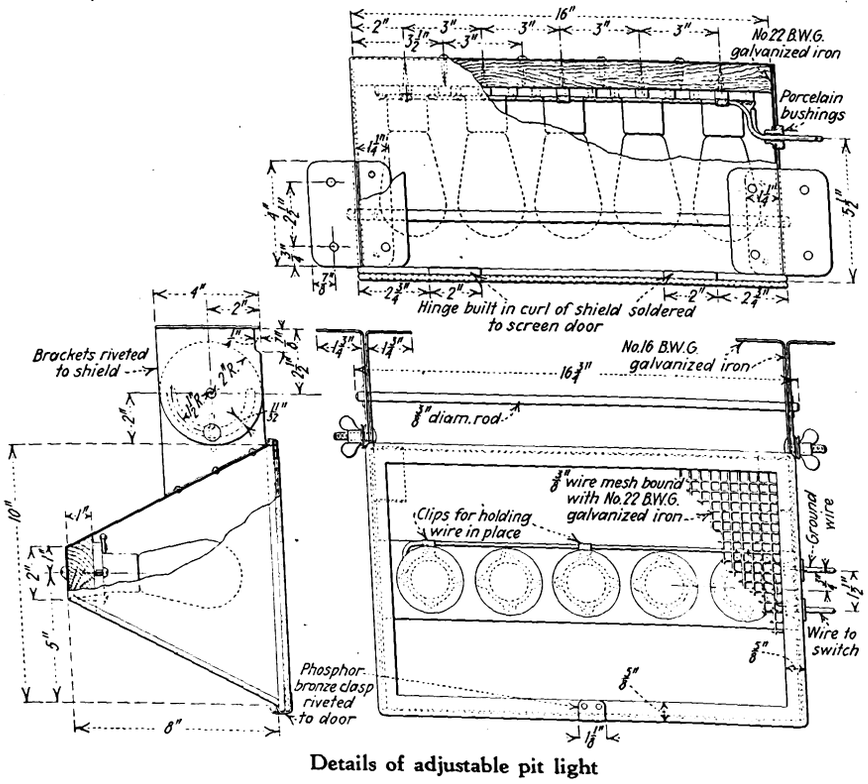
PIT lighting has always been a vexing problem. The scheme presented herewith has good points. Its object is to throw a flood of light upward to illuminate the underside of the car and at other times to provide the usual form of pit lighting.

It consists of a series of five lamps with a control switch placed conveniently. The lamps are mounted in a reflector which is guarded on the open side by a wire-mesh screen door. The reflector is mounted on suitable brackets and arranged to rotate upon a horizontal axis. This allows the fixture to be turned so that it is entirely out of the way when not needed and may be pulled out as desired to throw its light upward. Two such fixtures will completely illuminate the underside of a double-truck car.

*Submitted in Electric Railway Journal Prize Contest.



Connections for adjustable pit light



Details of adjustable pit light

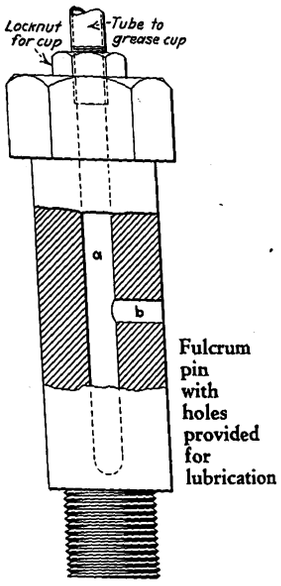
Better Method of Lubricating Brake Rigging Needed

By Albert M. Thomas
New York, N. Y.

IMPROVEMENTS have been made in the material and construction of the many joints, pins, levers, rods and brackets used in the brake rigging of electric cars. Hardened steel bushings and pins are quite generally used, but when these parts are dismantled at a general truck overhauling, it is usually found that the method of lubrication has not proved effective. Insides of joints are worn badly, pins are grooved and cut beyond the point for further usefulness, and the wearing surfaces are perfectly dry and show no trace of the lavish distribution of grease which smears the outside of the joints.

There are two important reasons for this dryness. First, the grease used is usually heavy and sluggish and lacks the penetrating quality necessary to reach the parts to be lubricated, and, secondly, the heavy, sticky grease smeared on the outside of the joint accumulates much dust, dirt and grit which is harmful to the joints. The heavy lubricant used is necessary, due to the design of the joint, and the thick coating mixed with dirt forms a grinding compound rather than a lubricating material. This also forms a thick coating through which additional lubricant cannot penetrate to get to the vital parts.

A method which has proved satisfactory, and which I believe merits wider use, is illustrated herewith. The broken cross-section shows a hole drilled along the longitudinal center of a fulcrum pin. Another hole, or several, if needed, is drilled so as to lead from the central hole to the circumference of the pin. These holes are used for supplying lubricant to the wearing surfaces. One end of the pin is arranged to take some standard form of grease fitting or is threaded to take an oil or grease cup. Where the grease cup is used, the cover is screwed on and fastened with a spring clip so that jarring when the car is in motion will not cause it to fall off. A locknut also keeps the end nut in place.



With this arrangement, oiling of the various parts is simplified and a thinner type of lubricant can be used to advantage. The tendency of the oil is to work from the inside of the joint to the outside, and this is of particular value in connection with the type of joint found in electric car brake rigging, as the forcing of the lubricant out also clears the wearing surface of any dirt or grit which may accumulate, keeping the surface clean as well as lubricated. It insures that the oils reach the points where they are needed most and so adds greatly to the life of the pins, rods, brackets, and other vital parts of the present brake rigging system.

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New Equipment Available

Reciprocating Grinder Car for Baltimore

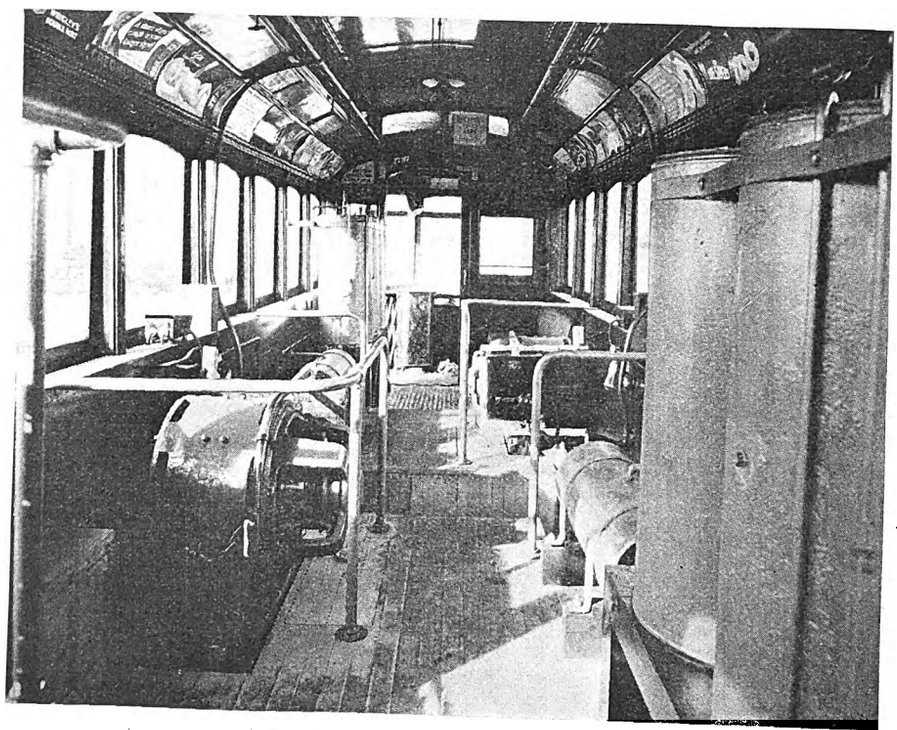
RAIL corrugations on the United Railways & Electric Company, Baltimore, Md., are being removed with a heavy-duty reciprocating grinder installed in a car. The grinder, furnished by the Railway Track-Work Company, Philadelphia, Pa., consists of two units, one on each rail. Each unit operates four abrasive bricks 4 in. long, 10 in. high and 3 in. wide. The grinding bricks reciprocate on the rail at the rate of 570 4-in. strokes per minute. Each unit is driven by a 10-hp., 1,200 r.p.m. motor connected by a silent chain to the crankshaft of the grinder.

The reciprocating grinder was installed in an old type car. All seats were taken out except one for the workmen. The floor was removed at the center of the car and lowered to form seats for the two operators, who sit back to back, one in charge of each grinding unit. Within reach of each man are all controls for his unit. These include switch, starting rheostat, lever for adjusting water supply and a megaphone for communicating with the motorman. A handwheel controls the pressure of the bricks on the rail to compensate for brick wear. There is also a handwheel for controlling the wedge which clamps the bricks together.

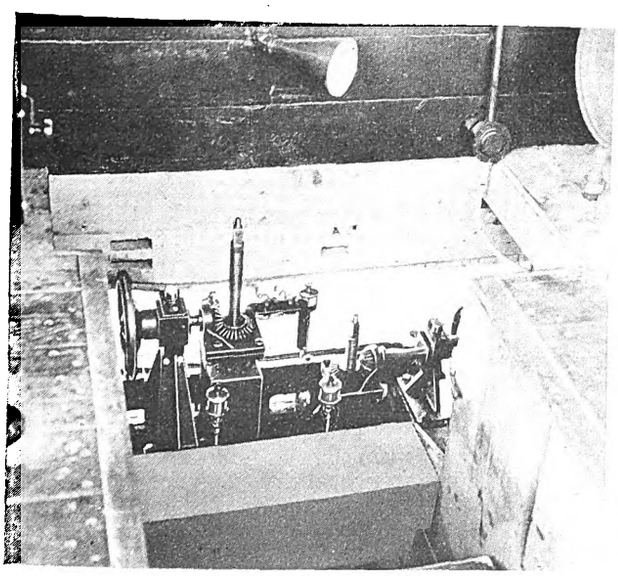
An improved feature of this heavy-duty reciprocating grinder is that the handwheels are stationary, that is, they do not reciprocate with the unit. This makes it easier for the operators in handling the work. Provision is made in the car for carrying the supply of water necessary for reciprocating grinding, 500-gal. having been installed.

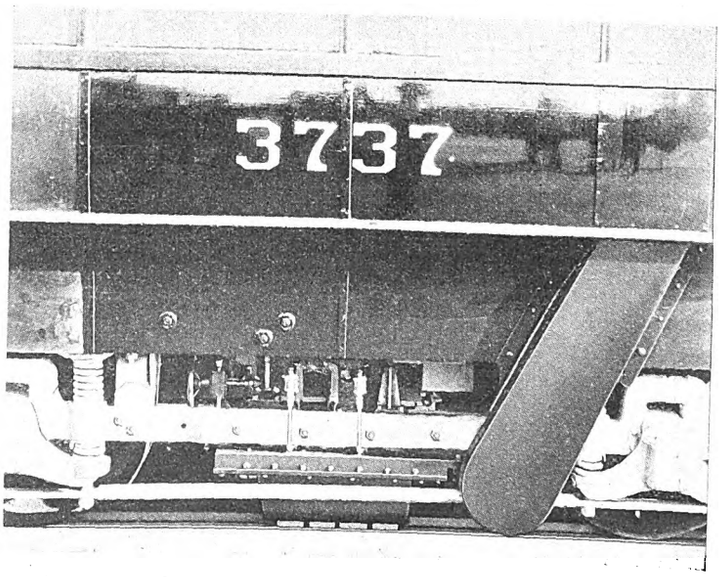
The great advantage of reciprocating the bricks of a grinder car instead of merely dragging them over the track has been shown conclusively in a comparison of both methods made by the United Railways & Electric Company. In addition to a very considerable saving in energy the reciprocating method also does its work with a thoroughness not obtained without reciprocation. If corrugations are not eradicated completely they will return very soon. The reciprocating grinders in the car may be operated as slowly as may be required to finish its work as it proceeds, or speeded up to accommodate schedules of passenger cars running on the same track.

If necessary to slow down or stop, in order to grind out heavily corrugated spots, this car can do it, whereas the drag car type of grinder cannot stop and work at the same time. Standard light-weight railway motors propel this car even when the grinders are under maximum load.



Interior arrangement of grinder car





At left—An operating pit is devised in the floor for convenience of the operator, showing method of installing grinding equipment

At right—Exterior of the car

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Association Activities

Making More Efficient Use of Existing Streets*

By John A. Miller, Jr.
Editor "Aera," Associate Editor, Electric Railway Journal

DELAYS to traffic caused by street congestion in Greater New York are resulting in an annual loss of more than $540,000,000, according to recent reliable estimates. This sum is $28,000,000 more than the city's budget in 1927. Everybody knows that traffic congestion is an extremely serious problem but perhaps not all of you have had time to analyze the causes of congestion and the merits of various plans proposed to relieve the present situation.

To get down to fundamentals. What causes traffic congestion? Are there more vehicles in the streets than the present roadway area can accommodate, or is there something wrong with the way that these vehicles are being operated—that is to say, something wrong with the way the operation is being regulated?

From numerous personal observations in various cities I am thoroughly convinced that existing roadways are ample to take care of the present traffic if its operation is properly regulated. In no instance that I know of, has the actual capacity of an existing street been reached. Fifth Avenue, New York City, is generally considered an example of extraordinarily severe congestion. Nevertheless, it would be entirely possible to move four or five times as many vehicles through this street as are now using it.

At present in the afternoon rush hour the north-bound private automobiles move in two lanes at an average speed of about 4 miles per hour. There is no good reason why they should not move in three lanes at an average speed of about 12 miles an hour. This has been found to be approximately the speed which gives a maximum capacity. When the speed is increased beyond this the spacing between vehicles is also increased so that no gain in capacity results. A similar increase of several hundred per cent in the traffic capacity of other streets could easily be accomplished.

Entire Roadway Needed for Moving Traffic

The first thing that is needed is to use all the available roadway for moving traffic. This is seldom done at present. Parking along the curb, dumping of building material in the roadway, opening up of pavement and other similar obstructions are common in every city.

Many retail merchants are opposed to any restrictions of automobile parking because they fear it will injure their business. This attitude is based on the misapprehension concerning the means of transportation used by customers to reach their stores. Careful checks made of nearly 500,000 customers at 76 big stores in New York, Chicago, Detroit, Cleveland, Los Angeles, Baltimore and other cities show that less than 15 per cent of the customers came by private automobile. The proportion was about the same in each one of these cities where a count was made.

The no-parking restriction in the loop district of Chicago is working extremely well. Two of the largest retail stores state that without question they have many more people coming to their stores by private automobile today than before the restriction. Checks made during May of this year compared with previous counts show a marked increase in the number of automobiles entering the loop district; the increase being 14.1 per cent while the increase in automobile registration was 10.6 per cent. This is in spite of some reduction in business activity in general. Thus it is evident that elimination of parking does not decrease the usefulness of the streets but actually increases it.

The average automobilist appears to believe that he has an inherent right to park his automobile in the public street. This is a fallacy. The streets were created primarily to permit movement of persons and vehicles. This has been pointed out clearly in the convincing window posters of the New York Railways. The legal principle involved was settled more than 100 years ago when Lord Ellenborough, Chief Justice of England, stated that "No one can make a stable-yard of the king's highway."

While parking is undoubtedly the largest single factor in obstructing a free movement of vehicles in the streets, other factors are by no means negligible. Loading and unloading of merchandise is a serious obstacle to moving traffic. Vans used for this purpose ordinarily back perpendicular to the curb, or at a slight angle, and thus create a worse obstruction than does a parked automobile. They usually remain for considerable periods. The cure for this is to require that such loading and unloading be done at night or that it be done within the property lines of the buildings. Either of these plans would be more expensive than the present practice. The seriousness of the present situation must be recognized, however, and people must be willing to pay a considerable price to cure it.

Building construction is a serious obstruction. Competent engineers have stated that there is no real reason why building materials cannot be stored within the property lines during construction. It would be more expensive and less convenient than to store them in the street but it is perfectly possible and should be done.

The public utilities themselves are not without blame in the matter of creating obstructions. They appear to have little or no compunction about opening manholes, or even the pavement itself, on the busiest streets during the busiest hours. Electric railways sometimes choose such occasion to repair their tracks. In these instances, too, it would cost more money to do the work in some other way, but so long as these practices continue the railways are in the position of "the pot calling the kettle black" when they criticize the obstruction to traffic created by others.

Traffic Should Move Faster

While the use of the entire roadway area of existing streets will contribute substantially to the relief of congestion, it is equally important that advantage be taken of every possible means of moving the traffic as expeditiously as possible. Since the establishment of traffic control lights on Fifth Avenue in 1918 the craze for signals of this kind has spread all over the country. Undoubtedly such signals are a good thing when properly used. Unfortunately, however, a large number of them are entirely unsuited to the conditions on the street where they have been installed. A study of the proper kind of lights and the best way to operate them is an imperative need at the present time.

To begin with, the real purpose of installing these lights should be determined. They are variously credited with speeding up traffic, saving policemen's wages, and preventing accidents. Under certain circumstances they may do any of these things, but it is expecting too much to think that all three can be successfully accomplished by one set of signals.

Much emphasis has been laid on the thousands of dollars saved in New York City by replacing traffic policemen with automatic lights. It has been stated by the deputy police commissioner in charge of traffic that when the program now under way is completed, traffic will be controlled mechanically at 2,243 intersections in the city, doing the work of 4,486 policemen. He is optimistic enough to believe that traffic will be

**Abstract of a paper presented at a meeting of the New York State Electric Railway Association, Coney Island, N. Y., June 14-15, 1928.*

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speeded up by the operation of these lights. Drivers of automobiles, however, make every effort to avoid using the streets on which these lights have been installed. This was admitted when the city authorities asked for an appropriation to increase the number of installations. It was stated that the purpose of extending the system was to prevent drivers from escaping to streets not so controlled.

The situation was well described in a recent editorial in the Detroit *News* which said that when a senseless mechanical contrivance winks its illuminated eye and brings to a halt several hundred vehicles and keeps a thousand or more people waiting while the clock ticks off the allotted time, but no one wants to use the cross street, there is reasonable doubt of the economy of automatic signals. In the course of a year, millions of people are inconvenienced and minutes totaling the equivalent years are wasted. Is it worth while to save the wages of a few policemen and produce this result?

The matter of accident prevention is more difficult to analyze. It has been stated that accidents are fewer on streets where traffic is controlled by automatic lights. Probably that is true. To what extent the result may be influenced by the tendency of automobile drivers to use other streets is difficult to determine. In any event there is no reason to suppose that unsatisfactory lights will prevent accidents more effectively than would a system of efficient lights. On the contrary, an inefficient system breeds contempt and lack of observance whereas a good system is likely to find favor with the drivers of vehicles and will encourage observance of regulations. The first consideration in the installation of signal lights, therefore, should be to expedite traffic.

Three kinds of control are now in general use. These are: (1) Synchronized signals whereby all lights show green for a given period and then red for a given period, (2) the wave or platoon system whereby all lights change at the same time but alternate signals or groups of signals give different indications—when properly arranged this permits continuous movement along the street—and, also, (3) the co-ordinated lights, such as have been installed on certain streets in Chicago and Cleveland, carefully adjusted to the needs of each intersection.

Engineering opinion is practically unanimous that the co-ordinated system is the most efficient and that the synchronous system is the least satisfactory. Apparently the chief reason for the continued use of synchronous lights is a kind of local pride which refuses to profit by the experience of other cities. Co-ordinated lights are expensive to install and some cities cannot afford them. Excellent results, however, can be obtained with the platoon system, as shown by the experience of Sixteenth Street in Washington, D. C., where the average speed of vehicles is somewhat more than 20 miles per hour. No general rule can be laid down for the installation of traffic signals, but it is of the highest importance that the system used be adapted to the needs of the particular situation. Municipal authorities must not think when they have installed traffic control lights that they have done everything possible to relieve congestion. They must install the right kind of lights, something that a great many cities, including New York, have failed to do.

Despite all the measures that may be adopted to increase the efficiency of traffic movement, however, the capacity of the streets will never be sufficient to accommodate everybody in his own private automobile. As a matter of fact there are many people, even today, who do not own automobiles, and there are many who do own them, but do not want to use them. Public transportation is, and will remain, a vital necessity in every urban community. The agencies which furnish public transportation will benefit by anything that improves general traffic conditions.

Increasing the Capacity of a Street System*

By Hawley S. Simpson
Traffic Engineer, Essex County, N. J.

PASSENGER-CARRYING capacity of a street system may be increased by two general methods; that is, by actual adding to (1) the street area, and (2) by making the most efficient use of existing facilities.

The first, and obvious way, is the plan on which the attention of the public can be most easily focused, and visionary schemes of multi-level cities of the future have become the vogue in Sunday supplements. It is extremely doubtful that such plans provide the ultimate solution, and in congested centers are economically prohibitive except in very exceptional cases.

Experience has shown that construction of new roadways, whether elevated or otherwise, rather than relieving congestion has the effect of attracting additional motor vehicles, until a balance point of equal congestion is again reached. Jefferson Avenue in Detroit is the heaviest traffic street entering the business district. Two parallel streets were narrow and poorly paved in 1924. One was widened and repaved between 1924 and 1925. Traffic in and out of the central business district increased about 11 per cent in 1925 over 1924. Traffic on Jefferson Avenue decreased 3 per cent, indicating a net decrease from the normal expected traffic of about 13½ per cent. Traffic on the repaved street increased 670 per cent, and the net increase on the three streets was 27 per cent, almost 2½ times the increase for the entire district. Following the improvement 2,600 more motor vehicles were driven into the downtown district and, instead of relieving congestion, actually made a bad condition worse.

Realizing that construction of elevated roadways and new highways in business centers is in general of questionable economic value, attention must then be directed towards the second and more immediately available method of relief, that of using to maximum capacity that which we now possess. The city of Chicago probably presents as good an example of the two methods of attack as exists anywhere. Wacker Drive, costing $22,000,000 for less than ½ mile of construction, will probably not have the beneficial effect that the co-ordinated signal system and no-parking regulations in the downtown district have had. Yet the latter two improvements cost comparatively little and are little known, while the former is known the world over.

Of all the unnecessary street obstructions probably none is so detrimental to a fluid movement of traffic as curb parking, although terminals of some sort are a necessity in fulfilling the act of transportation.

To analyze better the parking problem, vehicles stopped at the curb may be divided into three general classes, defined as follows:

1. Loading vehicle—A standing vehicle engaged in the process of expeditiously receiving or discharging passengers or merchandise.
2. Parked vehicle—A vehicle (excepting loading vehicles) standing not longer than a reasonable period.
3. Stored vehicle—A vehicle (excepting loading vehicles) standing longer than a reasonable period.

What constitutes a "reasonable period" has been quite definitely fixed at one hour for the average business district. Surveys have been made by the United States Department of Commerce which indicate that more than 90 per cent of all retail shopping trips can be concluded within one hour, which fixes quite definitely the dividing line between parked and stored vehicles. Shorter periods are difficult of enforcement, longer periods are proved unnecessary and, eliminating consideration of exceptional conditions, when and where parking is to be allowed it should not be for a period exceeding one hour.

Surveys of business districts will reveal areas in which parking is no detriment to traffic and may be a benefit to business, and again, there certainly are areas in which I would absolutely prohibit even stopping for loading and unloading during morning and evening rush hours.

The street is primarily designed for moving traffic, but where loading and parking do not interfere, they both become legitimate uses of street space. Upon the most heavily traveled arteries it is becoming necessary during rush hours to absolutely prohibit loading and unloading of both passengers and merchandise. Passengers may use side

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streets during these hours, merchandise delivery schedules must be arranged for other hours, heavy freight may be more economically handled at night, and light deliveries may be made during slack daytime hours. During the remainder of the business day, loading or unloading may be allowed in the center of the block, the no-stopping provision remaining in effect for a distance sufficiently far from the intersection to permit full use of the street at the critical point.

Rush hour regulations on medium traffic streets would be similar to slack hour regulations on the first mentioned street, no stopping being permitted near intersections and loading and unloading allowed only in the center of the block. During the base period of the day, when traffic does not require the full paved width of the street, one-hour parking could be allowed in the block, loading and unloading being allowed only near intersections.

There are few really light-traffic streets in present-day business districts, but *cul-de-sacs*, streets only one or two blocks in length, and similar streets having none of the characteristics of through or major feeder streets, do not require as stringent treatment as do streets carrying heavy traffic, and no-parking restrictions are neither necessary, obeyed, nor enforced. On such streets it is permissible to allow one-hour parking, reserving, however, a certain space, either near the intersection or in the center of the block, for loading and unloading.

Street storage in any business district should never be permitted, and this, rather than legitimate parking, is largely responsible for double parking. Although the connection is not at first apparent, storing, as defined herein, is responsible for much unnecessary street traffic. In a survey of Detroit's business district, 22 per cent of all curb cars were stored, and by virtue of their longer time at the curb (averaging three hours and four minutes) pre-empted over 60 per cent of the curb space. Parked cars (averaging 37 minutes) never exceeded 50 per cent of the available parking space. But the maximum momentary curb load was 25 per cent in excess of available curb spaces and standing cars exceeded curb space 6½ hours of the nine hours from 8 a.m. to 5 p.m. It is this 25 per cent shortage in curb space that was responsible for the illegal and double parking, when the number of cars actually parked at any one time would have occupied but half the available space.

In two locations in Detroit, one in the hotel and one in the retail shopping district, in one case 20 per cent, and in the other case 35 per cent of all traffic consisted of empty private cars passing the same point twice or more, the maximum being reached by one empty car which passed the same point 24 times in 33 minutes. At one of the locations ten private cars averaged 131 trips past the same point, producing thirteen times the traffic that would have resulted if curb parking space had been available.

All of this is due mainly to street storage, elimination of which requires first that enforcement be made more rigid, and second that sufficient storage garages be constructed to handle the long-time parker. Construction of storage garages will follow as a natural sequence to rigid enforcement and not before. Free street space is like a colored fly to a hungry trout, it may hurt if caught, but the chance seems worth the try.

If traffic surveys prove as they did in Detroit that street storage is a contributory cause of congestion, then such a city can well afford to employ sufficient police to rigidly and impartially enforce these regulations. When this is accomplished it is certain that no-parking areas can be extended to include all the heavy and secondary arteries. Such parking space as remains will not be a deterrent to moving traffic, but will be sufficient for the normal needs of the city.

Signals Often Hinder Traffic Movement

It may seem strange to class electric traffic signals under the head of obstructions to traffic flow, but in many cases they may be described as "nothing else but." The use of automatic traffic signals is becoming more and more prevalent among congestion-gripped cities in an attempt to remedy existing conditions, and to relieve a top-heavy budget.

At their best, traffic signals are not remedies, but only palliatives, and in many instances have failed to be of any benefit, having even further obstructed already impeded traffic. Unfortunately for traffic signalling, saving in policemen's salaries has in many cases been the prime objective to be attained, all considerations of increased safety and expedition of traffic movement being relegated to the discard. Four-way overhead installations using synchronous control were at one time standard practice and because of their prevalence many communities continue to erect such signals without having given the subject of a great deal of attention. The layout, construction and operation of a modern traffic signal system is not a job for which the average police official is fitted. Resort is had to the advice of an engineer employed by a signal manufacturer who, because of his connections, is not fitted to give impartial advice, nor does he have the facilities to make the necessary field surveys. No traffic signal system should ever be installed without an intensive survey to determine its necessity, and when this is done signals can be of real value.

It can be shown that for an average street layout the synchronous system of control will pass less than 50 per cent of the capacity of the street provided all grades were separate. "Wave" or "staggered" systems are little better and will pass no more traffic, but because traffic can be kept moving have a higher efficiency in the motorist's mind. However, this type of installation has been abused, and because of its inherent inability to allow more than one-half of the total cycle to the heavier traveled street, severely penalizes the major portion of traffic, while allowing unnecessary time for relatively unimportant cross streets. Where cross street and main street traffic are about equal, such a system is fairly valuable. But it must be remembered that this type of control is actually progressive only for a portion of the vehicles passing a given signal. If signal colors are reversed every two blocks, only the first half of a group of vehicles can pass the system without stopping, when three signals are tied together only one-third can pass, with four only one-quarter, and so on. It is such a simple operation to transform a synchronous system to the wave type that the change is often overdone. Wherever more than two signals show similar colors, I fully believe synchronous would be preferable, although in a large area where both north and south and east and west streets are controlled by the "stagger" system, a three-block "stagger" might be better than synchronous operation over the whole area.

There is no question but that on practically all street systems, a co-ordinated or "flexible progressive" system has advantages which no other control has,

COMING MEETINGS OF *Electric Railway and Allied Associations*

***June 25-29*—American Institute of Electrical Engineers, summer convention, Cosmopolitan Hotel, Denver, Col.**

***June 27-28*—Motor Bus Division, American Automobile Association, annual meeting, Hotel Gibson, Cincinnati, Ohio.**

***June 28-29*—Central Electric Railway Association, Cedar Point, Ohio.**

***July 8-12*—Public Utilities Advertising Association and International Advertising Exposition, Detroit, Mich.**

***July 12*—New York Railroad Club, annual outing, Indian Point, N. Y.**

***July 13*—A.E.R.A. Executive Committee on yacht "Florida," New York, N. Y.**

***July 18-20*—American Society of Civil Engineers, annual convention, Buffalo, N. Y.**

***July 19-21*—Pacific Claim Agents' Association, annual convention, San Diego, Cal.**

***July 25-27*—Electric Railway Association of Equipment Men, Southern Properties, Cincinnati, Ohio.**

***July 27-28*—Central Electric Railway Accountants' Association, Detroit, Mich.**

***Aug. 16-17*—Wisconsin Utilities Association, Transportation Section, Sheboygan, Wis.**

SEPT. 22-28, 1928

American Electric Railway Association, 47th annual convention and exhibit, Cleveland, Ohio.

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and such installations as now exist are ample proof of this conclusion. During the past year it has become possible to install a co-ordinated system, using apparatus manufactured by at least four reputable concerns, at a cost exceeding by little, if any, the simplest kind of a synchronous system. This is not the type used in the loop district in Chicago which involves a complicated central station, but an installation with timers at every intersection controlled by a simple impulse timer at a central point. The latter does not have the instantaneous flexibility of the Chicago installation, but it provides a reasonable flexibility to the extent actually used in Chicago.

Beyond this point, a co-ordinated system of somewhat less flexibility not quite so easily controlled nor so fool-proof in operation, is available at less cost than the synchronous, and experimental work has been completed on a control apparatus superior to any now existant and which promises to be less expensive.

If you railway men, who are vitally concerned in the type of signal system which is adopted, are confronted with the "can't afford it" story, you should be in a position to call the bluff and to prove the economic superiority of the best. What is most important of all, insist upon having the best of engineering study given to the local problem, rather than be content with opinions of manufacturers who are both the consulting engineers and the contractors.

Selection of Men As It Affects Service*

By Dr. C. P. Segard
Assistant Secretary Third Avenue Railway
New York, N. Y.

LIKE many other of our industries, the street railway has given more of its attention to equipment and operation than it has to the most important factor in its growth and success, man power. In the first place man power is the most expensive part of any organization. Steam railroads pay out 41 per cent of their income in wages, street railways around 50 per cent. This fact, if no other existed, should show how important man power really is.

A purchasing agent recently told me how he selected the galvanized buckets for his company. There were twenty to thirty points about a bucket that he considered important. Before making a selection the sample bucket was thoroughly inspected. Do we pay that much attention to the selection of men? Some companies have purchased more than one make of bus for there are different conditions under which they must be operated. In making a selection, every expert of any one particular part of the bus equipment passed judgment. Hours were spent in determining the type and kind. Yet it was, in the last analysis, worthless without the human element selected to run it.

Man Power Determines Production and Service

Machine production is a predetermined amount and it runs close, whereas man power is not so certain. A man is selective with regard to tools, material and action, whereas a machine has no such function. But there is another point of likeness and a point of difference that is even more important. Before you buy a $5,000 piece of machinery you look over the entire competitive field before you make your selection. The choice finally rests on the one that you and your associates, who professionally know that particular line, believe to be best suited to the purpose. Delivery is effected, the machine protected, foundations laid, machine tried out and watched for weeks. Frequently it is polished and dusted, oiled more frequently than necessary and shown to visitors as class A exhibit of the company. Not one quarter of this attention is usually given to an employee who renders more service, if efficient; costs more, if inefficient, and may be replaced by another individual about whom we know nothing.

There have been changes in the growth and development of the study of human beings. There have been discoveries in the sciences of medicine, psychology, sociology and economics. Just as we have kept abreast of the new in the electrical, mechanical and operating field, so we must keep abreast of the new in the study of man at work. There is much that is new in this field not being used generally. While the industry has had 40 years of growth and improvement, only the last ten have been used in improving the human relations. Not that we are 30 years behind, but rather that we have been slow to use the improvements offered in this field. Too often have we been content with the present. It is characteristic that the fads we knew so well 30 years ago are but tradition and opinion today. Some continue to live, yet the reason for their living has been lost or died of old age.

In the field of human relations policy must change because of other changes. Production requirements and machinery have so split up and simplified jobs that the semi-skilled learn in a few weeks a part of a job formerly done by journeymen. For that mass production job he earns greater economic independence and more leisure. Regardless of what is preferred you must adapt yourself to the present situation. Public policy and the public have changed.

To adapt ourselves to this situation we must know something of the human being himself. For it is just repeating the trial and error method to do something because some one else does or because it sounds well. Reasoning is required in the field of human activities as else where. There is a great deal of research available. Medical science has shown how to prevent disease and increase our vitality. Sociology has shown us the close relation between the home conditions and the employee's work. Psychology has shown us better methods of selection and training. We should be in touch with these improvements in man power just as much as we are in touch with the electrical, mechanical and operation improvements.

In the field of human relations, both industrial and public, there should be co-operation for the reason that all departments are involved. Public relations are absolutely and definitely dependent on your industrial or employee relations.

Methods in the selection of men for a specific purpose are becoming more scientific because we know more about them. One of the first problems we face is modern selection of employees and 1900 reception. In other words, though selection may be modern, the supervisory force may still be using methods of twenty-odd years ago in fitting the employee into the job. Both should improve equally.

Choosing Employees

The selection of an employee for any job, from unskilled to skilled, should not rest on the decision of any one person. This has been proved very often. No one individual, whether he be physician, psychologist, instructor or employment superintendent should ever alone make the rejection in cases of doubt. The physician can reject the weak heart, the psychologist the idiot, the superintendent the ignorant, but in doubtful cases, weight should be given to each factor. For it is from that doubtful group that the semi-skilled are found and in that group are the permanently loyal, with its corresponding low labor turnover.

We are selecting men with three points in clear view: (1) Those we believe are capable of doing the job of operating a trolley or bus; (2) those we believe will appreciate the necessity of service with safety; and (3) those that will make pleasing contacts with passengers.

As to the first, physical ability to do the particular job is easily determined. As to mental ability, it is just as well to pause a moment and take stock. Selection on this point has been a matter of decision by interview. It is today in many quarters wholly governed by one interview. In many cases it is sufficient, but some believe that one interview is not enough. In addition, the free use of such material as various sciences have to offer in selection is slowly being adopted.

As to the second, we have tried to determine what human factors lead to accidents in order not to select men with those factors. These factors are emotional instability, certain physical defects and age. Fisher groups eight

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types of minds of the average individual as causes of accidents. These are puzzled, misguided, stubborn, involuntary, diverted, physical, tired, and troubled. To these we may add those types that are obviously abnormal. If these types are permanent in the individual, the interview or the interview plus the period of training, may reveal the condition. To find them in a group of applicants is not always easy and requires experience, observation and cooperation with other interviewers. I may as well admit here as anywhere that I favor the training, no matter how brief, of all new employees in this industry.

Importance of Courtesy Not Always Appreciated

The third point—that of courtesy in contacts with the passenger—is more important than we recognize. Your conductors, motormen and bus operators are each in daily contact with hundreds of passengers. Most passengers will not notice particularly a courteous, thoughtful agent of the public utility—but let him become crabbed, disgruntled, or in the slightest degree disagreeable, and every passenger will immediately side against him. Not only against him but against every employee of that utility and sometimes it reflects on every employee of every utility concerned. Good contact men are an asset to any business and this is especially true of the street railway industry. Facing a rubber competition, by individual car, as well as bus, it must not only preserve its customers but secure new ones.

In cities of any size it must go after the short-haul group. In my opinion this group is not only essential but it is there for the asking. Just as the five and ten-cent store entered a field where all the wise ones predicted failure, so the trolley can continue to serve as the economic mode of transportation. Just as the five and ten have made it easy to shop in their store, so the contact men must make it easy and pleasant for the short-haul riders. It must be remembered that the short haul has a wide variety of choice and you want him to be your customer. Why do I go to one store in preference to another when the goods and prices are almost the same? Service and the attitude of those who serve. We do not lose the short haul because of inconvenience, waiting, or lack of comfort; not at all. He has to put up with inconveniences when he walks or taxis. If he is treated as though he were a necessary inconvenience by the company's representatives, he walks. If the contact man of the public utility is going to make the prospective customer feel as though he were being favored, he will not want to ride. He does not wish to be irritated, spoken to in a disrespectful manner or treated in a way that interferes with his customer attitude. I am fully convinced that the short-haul business belongs to the steel or steel mode of transportation if the customer-salesman attitude of new business is present on our lines.

Lack of Progress in Car Cleaning*

By Hugh Savage
Superintendent of Equipment Brooklyn City Railroad, Brooklyn, N. Y.

VEHICLES must be kept well painted in attractive colors, and unless they are kept exceptionally clean both inside and out they will cease to attract patrons. It is necessary to provide for daily washing of the exterior, thorough sweeping and dusting the interior, cleaning the windows and lamp globes each day and giving the inside of cars a general cleaning at regular and frequent intervals before we can say that we are not lacking of progress in car cleaning methods. After all this is done we still lack perfect methods.

There is no more effective form of advertising, nothing which will do more to create a desire to ride, than clean cars. All the fancy upholstery, bucket seats, swivel chairs, mosaic floors and fancy trimmings that can be installed cannot compensate for dirty floors, dusty and dirty walls and window capping, dirty windows and lighting fixtures or an accumulation of gum and candy wrappings, newspapers, transfers, etc., in the car.

In order to have clean and inviting cars during the off-peak hours, which is the time during which we all are trying to encourage more people to ride, it is necessary that cars be given some cleaning after the morning rush hour. In addition to this, cars should receive a daily cleaning inside and outside and have all glass cleaned. This should be done at night to insure cars being clean on the first trip out in the morning. Car crews should make more effort to keep cars clean. To clean cars more frequently will cost money. Expenses will increase. This is admitted without argument if car cleaning continues to be done with the facilities and under the conditions existing on most of our properties now.

In general, properties are doing about all that can be done with the facilities provided, and it seems that it is high time the industry as a whole began to look the situation squarely in the face and for the managements to ask themselves "are we really sincere when we say we are doing all that we can to build up our business by giving better service and creating better public opinion?"

In the early days street car cleaning was done in a very simple manner. A pail of water and a long-handled brush were the material and equipment employed, along with plenty of elbow grease on the part of the car washer. Many properties today use the same methods. About 30 years ago solutions of soap containing varying amounts of alkali or solutions containing acid or abrasives were in more or less general use, it having been found that water and mild soap would not remove the greasy grime. The use of such solutions resulted in decided damage to the finish unless quickly applied and very thoroughly rinsed off. The abrasives scratched the surfaces, causing more grime to stick. During these times labor was cheap, the urge for speed in all operations was not so strong, and there was no competition from bright, shiny and clean automobiles.

During later years the problem of cleaning cars has in general received more attention and some efforts have been made to approach the subject in a more scientific manner. Competent chemists have studied the character of the deposits of dirt, grime, etc. As a result, cleaning compounds are now available which give a maximum of cleaning action with a minimum of injury to the varnished or enameled surfaces. In general they are of a slow drying nature and in liquid form, which makes the necessary thorough rinsing easier.

Seat Maintenance Important

Cleaning, dyeing and refinishing materials are also being produced for use in cleaning, coloring and refinishing plush or cane covered seats, and for cleaning curtain materials. These compounds will remove grease and stains on seats or curtains. The coloring compounds will restore or color materials, making badly discolored seats and curtains look comparatively new.

The demand for cleaner cars, and such studies as have been made as to how to obtain them, have called attention to the antiquated methods and appliances used. During the past few years there has been some development along the lines of labor-saving devices with which to clean cars quickly, thoroughly and cheaply. The trend today is toward vacuum cleaners for cleaning the inside of cars and power washers using a spray and revolving brushes for cleaning the outside of cars.

Vacuum cleaners have been a common household article for years and there are many large buildings cleaned by this system, but the number of railways using anything but the old sprinkling pot and the stubby broom can be counted on a very few fingers. The situation today is that there has been so little interest displayed on the part of railways that there is not available on the market apparatus suitable for this work which can be used where 600-volt d.c. is the only power available, neither have suitable portable outfits for use in unpaved storage yards been developed. There is little doubt that if there is sufficient interest, manufacturers will develop adequate apparatus and cars can be cleaned inside and outside more frequently and at less cost.

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To obtain the full benefit of a power washer for car exteriors it is necessary that tracks be so located as to permit of rapid and easy movement of cars to and from the wash house or wash track, so that extra car movements will be reduced to a minimum. To do this work properly the car should first enter a heated room in the winter, and after washing should be dried thoroughly, either in winter or summer, before being put in service or stored.

There has been developed recently a power washer outfit which is claimed to be almost entirely automatic, requiring only one man, whose duties are to operate the car slowly through the washing apparatus. It is to be hoped that this apparatus will be developed fully along with a real vacuum sweeping outfit, and adequate trackage and housing facilities made available to those of us who wrestle with this problem, so that when we are asked, "Are you lacking of progress in car cleaning methods?" we can answer "No," we preach and practice that cleanliness is next to godliness.

Modernizing Car Equipment Maintenance*

By Niles Persons
Superintendent Surface Line Shops Brooklyn-Manhattan Transit Corporation

RAILWAY equipment men today must resort to every conceivable means known to maintain the equipment at the high standard demanded and at the same time keep the costs down. Labor cost is the big item in maintaining car equipment. We have learned a great lesson from our brothers in the automotive industry and are gradually purchasing modern machinery and tools to perform the work.

Our company has spent in the past three years, for the surface division, an amount approximating $1,500,000 on new shops and machinery. As a result car failures are reduced to a minimum. The company has also expended for machines and shop equipment for the rapid transit lines approximately $2,000,000. These are installed in shop buildings constructed by the city of New York at a cost of approximately $4,000,000, exclusive of grounds and yards.

Owing to the large territory covered by our system, cars are assigned to various inspection shops and storage yards conveniently located for economical operation. Each inspection shop has a storeroom where sufficient repair parts and supplies are kept to make the necessary minor repairs to cars. These materials and repair parts are stored in steel bins, neatly lettered and cataloged so as to make replacement easy.

All these shops are equipped with automatic air compressors. Pipe lines lead to various locations about the buildings supplying compressed air for blowing out of motors, for control and for the operation of pneumatic tools. In each inspection shop there is a small machine shop, which is provided with lathe, drill press, grinder, bearing boring machine and blacksmith shop equipment. Overhead electric-operated traveling cranes facilitate the quick and easy handling of the heavy parts.

Special attention has been paid to the lighting of these shops and in all cases where possible, skylights have been installed. The concrete pits where adjustments and repairs to trucks and motors are made have been equipped with lamps evenly distributed along both sides so as to furnish adequate light for the workmen under the cars. In winter, these pits are heated. Throughout all our shops special efforts are made to keep them clean. Steel racks are available to hold spare armatures, iron, lumber, extra draw bars, etc., to keep them off the floor and permit easy cleaning. Plenty of large galvanized cans are distributed about for holding waste and scrap material, and these are emptied every night. In the clean and attractive locker rooms each man is furnished with a steel locker large enough to hold his personal belongings. Large circular sanitary wash basins with hot running water are provided for employees.

Better Car Cleaning Equipment Needed

Car cleaning is one of the important duties assigned to the inspection shops. A concrete wash track at one of our inspection shops is installed in a bay with Kinnear roller doors and heated so that washing can be carried on regardless of the weather. The wash bay has two concrete troughs, one on either side of the track. The troughs are 10 in. wide, 10 in. deep, and 65 ft. long. The floor has sufficient slope and is connected to the sewer so as to carry off the surplus water. The two long troughs are filled with a continual flow of clean fresh water, hot or cold, as desired. Car washers stand on either side of the car bodies with long handled soft brushes which they dip in the troughs of clean water to wash the windows and also the sides of the cars. At the same time that the outside is being cleaned, men are working inside.

When one car is finished, it is moved up and another one immediately takes its place on the stand. By this method, we have been able to concentrate all the cleaning of one carhouse at one point, which makes supervision easy and at the same time, by the adoption of piece work, we have speeded things up. Results obtained by this installation are so satisfactory that plans have been completed and work is under way to equip all our inspection shops. Paint and varnish on the cars stand up much better under this method of cleaning because plenty of water, free from dirt and grit, is used.

All heavy repairs, overhauling, rebuilding and construction work is handled at the main surface repair shop, which is known as DeKalb shop. Here we have a large, modern plant, which was finished in 1926 and equipped with everything to facilitate the speedy repairs to surface cars. Here, also, large windows and skylights are placed so that plenty of daylight is furnished to every location. Artificial light is also provided by a well distributed system.

Tracks where the car bodies are repaired are spaced far apart so that plenty of room is available about the cars for scaffolds, etc., also allowing plenty of aisle room for the unobstructed passage of electric trucks handling materials. Large traveling cranes pick up the car bodies, trucks and other heavy parts, and deposit them where desired. All departments also have small traveling electric cranes for the speedy handling of heavy units. Machines are all independently motor-driven, with push-button control. This eliminates all overhead shafting and belts.

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National Bus Association Completes Program

PRACTICALLY all phases of bus transportation will be discussed at the second annual meeting of the Motor Bus Division, American Automobile Association, to be held in Cincinnati, Ohio, June 27-28, at the Hotel Gibson. The following program has been announced:

Wednesday, June 27—10 a.m.

Address of Welcome, followed by reports of chairman, secretary, and special and standing committees.

1 p.m.

"The Motor Bus—A Specialistic Transportation Unit," by F. R. Fageol, president Twin Coach Corporation.

"How Motor Bus and Railroad Service Should Be Co-ordinated," by H. P. Fritch, president Boston & Maine Transportation Company.

"Bus Terminals and How They Should Be Established and Operated," by W. E. Travis, president American Motor Transportation Company, Oakland, Cal.

"Equipment Maintenance and Its Importance in Bus Operation," by A. E. Hutt, Vacuum Oil Company.

Thursday, June 28.

"System in Motor Bus Operation," by Guy Huguelet, president Consolidated Coach Company.

"Commission Control Over the Certificate of Convenience and Necessity," by E. Blythe Stason, professor of law University of Michigan.

"Merchandising the Bus Business," by Edward A. Keenan, advertising manager Philadelphia Rapid Transit Company.

Thursday afternoon will be devoted to a business session of the association, including the appointment of special and standing committees.

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News of the Industry

Seven Cents Sought in Harrisburg

New rate will go into effect on July 17 unless commission suspends the revised tariff

THE Harrisburg Railways, Harrisburg, Pa., has filed with the Public Service Commission a new tariff, to become effective as soon as legally permissible. It provides an increase of one cent in the rate of fare. According to the company the new fare of 7 cents, is the minimum which the railway can charge and continue to give satisfactory service to the public.

Since its organization, the street railway system of Harrisburg has made only one increase in the fare. That was in 1918, when the 5-cent fare was increased to the present fare, 6 cents.

The company explains that compared with the rate of fare charged in other cities, Harrisburg will continue to be among the communities where the lowest rates are charged. In this connection it says:

> The fare which the Harrisburg Railways proposed therefore is less than the average cash fare in the country, and lower than the rate of fare charged in the majority of Pennsylvania communities. It is lower than the ticket rates in Philadelphia and Pittsburgh, and in many other communities.

This is how the company see it:

> The change in fare is made necessary by the condition the company faces. It must continue to render good service at all times of the year and under all conditions, for its service is recognized to be necessary to the continued prosperity and convenience of the city and its people. The increased use of private automobiles has caused a decrease in the number of passengers carried, without making possible any decrease in expenses. The company has been compelled to discontinue paying dividends. It faces heavy expenditures for paving and other public improvements. It is economically managed, and strives to render not only good service but courteous service to the public.
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> To continue rendering efficient service, it must have revenues adequate to meet the cost of the service and to earn a reasonable return upon the value of the property. The situation compels an increase in the rate of fare.
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> Faced with a curtailment of service or an increase in fare, the company is working upon the theory that the public is willing to pay for continued good service. The feeling of the company is that it can at least maintain its present service under the new rate.
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> The April 1 payment of dividend was passed because it was not earned, company officials said. Dividends immediately previous had been paid, but several others in late years have been missed.

Levies against the railway for several public improvements, including a paving program, the Market Street subway and the Paxton Street cut-off, have made inroads into the net earnings, it was declared, while necessary construction work on the company's own lines has required a large sum. Track replacements and new equipment for 1928 demand an outlay of $180,000.

The fund of approximately $300,000, which the company recently obtained from the sale of majority holdings in the People's Bridge Company will be applied to the debts for improvements, and cannot be diverted to dividends, according to the company's spokesmen.

Notice of the proposed new rate will be supplied interested parties by the Public Service Commission, and a date for hearing set, following the filing of protests, if any are filed.

Revision of Detroit Finances Suggested

Report to Mayor says that unless Municipal Railway's annual debt maturities can be rearranged fares should go up to meet spirit of city charter, if not its letter

IN A REPORT on the Detroit Municipal Street Railway Department, Ralph Stone, chairman of the board of the Detroit Trust Company, pointed out that unless the Street Railway Commission refinances the debt of the D.S.R. so as to extend it over a longer period of years than is provided under the present scheme, an increase in fares is necessary to comply, at least, with the spirit of the Detroit charter.

Two months ago Mr. Stone was requested by the Mayor to make the report for the purpose of reconciling the two separate audits for the year ended June 30, 1927, rendered by Price, Waterhouse & Company and by William M. Hauser, former auditor of the D.S.R. According to Mr. Stone's report the controversy arose over the matter of depreciation and the different ways in which it was considered.

Mr. Stone reported that no attempt was made to discuss in the precise professional language of accounting the questions that seem to be at issue between the auditor and the public accountants, but the report has been rendered as it would be stated by a business man experienced in dealing with public utilities and in analyzing financial statements.

In the report no attempt was made to define depreciation. Mr. Stone merely says, in terms that are not intended to be technically accurate or inclusive, that "it (depreciation) is a sum taken out of earnings (revenue from fares in the case of street railways) and set aside, either in cash or a credit to a depreciation reserve which is merely a bookkeeping account, to represent or care for the wearing out or obsolescence of property."

It is pointed out that Price, Waterhouse & Company set the depreciation for the fiscal year ended June 30, 1927, at $1,568,255, computed, "at the rate of 3 per cent per annum on the book value of depreciable property, excluding motor coaches." Mr. Hauser arrived at the figure $1,223,380 as the depreciation, using two methods, one being a balance in the income and profit and loss accounts, and the other by computing 3 per cent on an amount which he said was the depreciable cost of the properties. This cost Mr. Hauser stated as $31,718,463, but he fails, according to Mr. Stone, to explain how he arrived at that sum. Mr. Stone prefers the Price, Waterhouse & Company method of computing the depreciation. That company's figure is $344,874 in excess of Mr. Hauser's.

The Price, Waterhouse & Company report stated that it was to be regretted that a more specific statement as to what was intended to be contained in the expression "fixed charges" was not set forth in the charter especially with regard to the element of depreciation.

"From an accounting standpoint, depreciation is generally a fixed charge, so that from that standpoint the city charter requires that the rate of fare shall be sufficient to cover both the ele-

> RALPH STONE, chairman of the board of the Detroit Trust Company, stated in a report Mayor John C. Lodge made public on June 16 that an increase in fares on the Detroit Municipal Railway is necessary, barring a possibility that the problems of the D.S.R. can be met by rearranging annual debt maturities.
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> After referring to the matter of extending the time for the debt payments, Mr. Stone said:
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> "Unless this is done, it looks from such information as we have that a raise in fares will be needed to comply with at least the spirit of the city charter, if not its letter. It is not possible to say that an adjustment of the existing rates of fare could be avoided by a rearrangement of the debt maturities."

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ments of debt, retirement and depreciation," the accountants stated in their audit. "On that basis and accepting as adequate the depreciation provisions made in the accounts, the net income for the year under review (1927) was insufficient to the extent of $687,329." By using Mr. Hauser's figures and deducting depreciation from the gross income, the net income was $609,425 short of meeting sinking fund requirements, according to Mr. Stone.

It is pointed out that Mr. Hauser objected to deducting the depreciation, saying in a communication to the Mayor and Council on Feb. 10, 1928, that "it is impossible to pay for two plants at the same time, and that is, in effect, what is being done when depreciation and sinking funds are both established." Mr. Hauser obtained a figure of $613,955 excess of income by excluding depreciation except depreciation on motor coaches. This he charged as an operating expense.

Mr. Stone states that the difference in viewpoints of the auditor and the public accountants raises a question of construction of Section 14 of the city charter which he understands has been submitted to Corporation Counsel Clarence E. Wilcox. He further says that it seems to him that "sound public policy contemplates that the property should be paid for out of earnings and at the same time be kept in good operating condition. Keeping it in good operating condition means not only expenditures for maintenance, upkeep and repairs, which are items of operating expense, but also for replacing property worn out or become obsolete, which is depreciation." Mr. Stone continues:

If this is true, then depreciation should be included in the rate of fare, and if the corporation counsel determines that as a matter of law depreciation is not a fixed charge, the city charter should be amended to include it.

Naturally the charter should provide that the railways, through their operation, should pay the expense of operating them, taxes, interest on their debt, expense of keeping them up in good operating condition by repairs and replacements (depreciation), and the principal of their debt—and all that must be done out of revenues and fares.

Obviously, a charter is only a statement of principle and if it does not state it clearly it should be so amended that it does. It should not specifically and in detail instruct the Mayor, Council and Railway Commission how to do these things, because conditions change. It should be flexible in its terms.

I am not qualified to interpret the charter, but it seems to me that Section 14 of the charter is sufficiently flexible in its terms to permit depreciation to be included as a fixed charge, and if, after doing that, the existing rate of fare results in a deficit, the city authorities have it in their power to ameliorate the situation.

In other words, if including both depreciation and sinking fund charges results in a depreciation so that the rate of fare must be raised to comply with the charter, the authorities have power to reduce the sinking fund charges by refinancing so as to extend the maturities of the bonds to be paid in each year out of revenue from fares. If the phrase in Section 14 of the charter—"in the sound discretion of the board"—does not mean this, it would seem to be true that the board would have power anyway to refinance so as to rearrange the maturities of its existing debt.

If rearranging the maturities still leaves a deficit then the rate of fare must be raised, and that is only common sense. If it is not done nothing is gained and only trouble follows. The trouble would be the deterioration of the physical property of the railways and that in turn means poorer service and ultimate breakdown of the system.

Revenue and net income of the system as arrived at by the two audits, and the auditors' distribution of expenditure to capital and expense accounts, is also discussed in Mr. Stone's report. In this connection it is pointed out that Mr. Hauser differed throughout from Price, Waterhouse & Company on his report of the revenues and income of the D.S.R. Mr. Stone says that they practically agree, the average of the income given in the two reports being $3,488,582.

It is further pointed out that the accountants contended that some items charged as capital expenditures by Mr. Hauser should in part have been charged to operating expenses and that if the items were not correctly apportioned at the time of original entry, it would be difficult to make a correct apportionment now.

Mr. Stone is further quoted in his report:

I am advised that the executive engineer of the D. S. R. is now compiling the cost or value of the properties as a basis for this distribution and when that is done the difficulty of allocating to capital and expense will be remedied. This applies likewise to the cost of rehabilitating the properties acquired from the Detroit United Railway.

Therefore, I believe this difference between the two reports may as well be dismissed even though it leaves as an open question the amount of 1927 net income from operation. If the same form of accounting is maintained hereafter it will be important to have the different kinds of expenditures allocated under direction of the executive engineer.

Survey Commission Bill in St. Louis Passed

The St. Louis, Mo., Board of Aldermen with only one dissenting vote on June 8 passed Mayor Victor J. Miller's bill providing for the creation of a transportation survey commission to make a comprehensive survey of the mass transportation needs of the community. A fund of $50,000 is provided for the expenses of the commission, which will consist of sixteen members. It will study both electric railway and motor traffic conditions as well as the city's rapid transit needs, such as proposed subways and elevated systems.

The commission will include the Mayor, comptroller, presidents of the Board of Aldermen and Board of Public Service, the director of streets and sewers, a representative each of the Missouri Public Service Commission, the St. Louis Public Service Company and the City Plan Commission and seven private citizens.

Utility Hearings Concluded

Commissioner McCulloch of the Federal Trade Commission, who has been conducting the hearing in the public utility investigation, announced that after July 7 no further hearing will be held in the investigation until Sept. 1.

Delegates at Kansas City Handled With Ease

Additional crowds at the recent Republican National Convention in Kansas City, Mo., were handled with ease and expedition by the Kansas City Public Service Company by bus and car. The greatest strain on the local transportation system occurred during the parade on the opening night of the convention. Estimates place the number of people who on that occasion crowded into the downtown district at between 200,000 and 300,000. The service on both cars and buses was doubled to take care of the incoming crowds from 6 o'clock until 8, and again after the parade to return them to their homes.

A special bus service was established from the Union Station to the hotel district, beginning Sunday, June 10, to handle the incoming delegates to the convention. The service was reinstated again the last of the week for the benefit of the departing visitors. This was a regular 15-cent line, giving 10-minute service.

The greatest increase in patronage was on the Gray Line sightseeing buses, with from one to seven buses leaving each hour. The regular schedule is three trips a day.

Preparations for Arbitration in Toronto

D. W. Harvey, general manager of the Toronto Transportation Commission, Toronto, Canada, sent a letter to W. D. Robbins, secretary of the employees' union on June 13 stating that the commission had withdrawn the alternative of June 8, namely, a renewal of the existing agreement, since this alternative was not accepted by the men at the mass meeting held on June 9. The other alternative had been the offer of a board of arbitration to consider all wages and working conditions. Since the men, however, had agreed to submit all proposals which either the men or the commission might make as to future wages or working conditions to arbitration there was no reason why two impartial and disinterested appointees should fail to agree upon a chairman. If they should fail to agree upon a chairman the commission would be willing to leave such choice to the Mayor of Toronto. Following this communication the men named James Simpson as their representative.

At the mass meeting of June 9 the men had voted to submit the whole matter to conciliation under the Lemieux Act, but Mr. Harvey pointed out that the provisions of that act did not apply to that commission.

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Bankers Prepare to Finance Cleveland Subway

Announcement was made in New York on June 22 that a syndicate headed by the Equitable Trust Company, New York, has been formed to underwrite an issue of $30,000,000 bonds and preferred stock to finance the construction of the proposed subway system in Cleveland, Ohio, to which reference has been made before in ELECTRIC RAILWAY JOURNAL. It is intended to incorporate the Cleveland Subway Company, which would be under the control of the city, to build the subways. An ordinance authorizing the construction of the system will be introduced in the City Council, probably on June 25.

According to the plan now being considered, the subways will be operated by the Cleveland Railway. It is planned to sell the bonds and preferred stock in the Cleveland Subway Company to pay for the cost of construction and to place the common stock in escrow, to be turned over to the city when the system is paid for out of earnings. The idea is to make the new securities quasi-municipal obligations, payable out of revenues of the utility and not from the general city taxes. In this way the improvement can be made without increasing the debt limit of the city.

Hearings in Baltimore Fare Case Concluded

The Court of Appeals of Maryland, sitting at Annapolis, has completed the hearing of arguments in the court case growing out of the action of the Maryland Public Service Commission in granting the United Railways & Electric Company, Baltimore, a 9-cent fare or three tokens for 25 cents. A straight 10-cent fare had been sought.

Following the decision by the commission the United took the case into the Baltimore courts and Judge Joseph N. Ulman held that the commission's decision allowing 6.26 per cent earnings annually on a $75,000,000 valuation was confiscatory. The court also held that it was illegal to limit the company to a 9-cent fare. It was on this decision that the Public Service Commission appealed the case. Pending the final action of the Court of Appeals the United made no change in its rates.

Before the Court of Appeals the hearing consisted largely of discussing at length the same points brought out at the hearing before the commission and before the lower court. The court did not announce when it would hand down its decision.

Library in Portland Grows

An announcement has been made that an unusual number of new books, magazines and pamphlets has been added to the library shelves of the Portland Electric Power Company, Portland, Ore. The most important, says the *Pepco-Synchronizer*, the company publication, are the 63 volumes published by the International Correspondence Schools covering a wide range of subjects.

Higher Fare Sought by Capital Traction

An application for relief was filed on June 15 with the Public Utilities Commission by the Capital Traction Company, Washington, D. C., requesting a straight 8-cent cash fare or a 10-cent fare with four tokens for 30 cents. The present rates are 8 cents cash or six tokens for 40 cents on both systems of the District.

In an advertisement "A Statement to Washington Street Car Riders" John H. Hanna, president, said that because of the postponement of the proposed transit merger the company had been forced to appeal for relief as for more than three years it had failed to earn a dividend of 7 per cent. The value of the property used for public service was fixed by the courts at $26,000,000. To enable the company to earn such a return a flat fare of 10 cents would be necessary, but it was "very much disinclined to ask for a greater increase over existing rates than is necessary to take care of the present urgent situation." He said that public esteem was an asset of the highest value but, confronted with the hard facts stated, the company could not continue to jeopardize the investment and income of thousands of stockholders through failure to seek relief to which it was legally and morally entitled. He quotes 26 cities of more than 100,000 population in the United States where a 10-cent fare is charged. In concluding his statement, Mr. Hanna says:

> No individual or corporation owns as much as 5 per cent of the Capital Traction Company's stock. The bulk of it belongs to Washington men and women, who depend largely upon it for their living. The directors of the company are merely trustees for the stockholders. They believe the public generally, when they become familiar with conditions, will be willing to pay the moderate increase in fare requested.

Officials of the Washington Railway & Electric Company have announced that they are not a party to the petition of the Capital Traction Company for an increase in fare, but it is generally accepted that the Utility Commission of the District of Columbia will require both companies to maintain the same fare in case the increase is granted. The present position of the two railways is just the reverse of what it was at the last time their fares were adjusted.

The Washington Railway & Electric Company earnings are better due to the return on its investments and due to operating economies which it has been possible to bring about by securing the entire allocation of one-man car operation allowed by the Utility Commission. Moreover, the company has secured practically the entire benefit of the development in the suburban districts, which it serves almost exclusively.

Chicago Fare Case to Be Concluded

Final arguments for and against the proposed 20 per cent increase in fares of the Chicago Rapid Transit Lines will be heard by the Illinois Commerce Commission on June 26. With the presentation of testimony of its sale witness, a city accountant, other brief evidence against the application at a hearing in Chicago on June 14, attorneys for the city completed their arguments. The elevated lines are asking for the abandonment of the three-for-a-quarter ticket rate and $1.25 weekly pass and the substitution of a straight 10-cent fare.

Since the filing of the company's petition on Feb. 21, the city, through its counsel, has contended that the company cannot obtain a fare increase without first having made a new valuation of its properties and that the company has failed to introduce such figures in its evidence. Company representatives, on the other hand, insist that a new valuation is unnecessary, maintaining that the valuation accepted by the commission in 1921 at $86,250,000, plus $7,750,000 of net additions to property since that time, is just and reasonable. This valuation was based upon a reproduction cost of $95,000,000 less depreciation reckoned at $14,750,000, and to which amount $6,000,000 was added later for working capital.

The principal argument brought out by the city was that the 1921 valuation should have been only $60,000,775 and that subsequent additions bring the present total to only $68,360,724 instead of the $94,000,000 claimed by the company's officials. Under this valuation, the municipal attorneys declare, the proposed fare would yield a return of 11.3 per cent as compared with the 6.02 per cent estimated by the elevated lines' representatives. Testimony introduced by company attorneys showed that in 1927 the Rapid Transit Lines earned only a 2.89 per cent return, and receipts for the first five months of 1928 show this has dropped to 2.28 per cent.

W. J. Smith, one of the commissioners who is hearing the case, announced after the conclusion of the city's arguments that engineers and accountants for the commission would continue their independent investigation of the evidence, and if further testimony is believed to be necessary to an equitable decision the commission may offer some testimony on its own behalf.

Blue Ribbon Specials for Sale in Jacksonville

In conjunction with the annual merchandising event at Cohen Brothers, Jacksonville, Fla., from May 7 to May 14, the Jacksonville Traction Company operated Blue Ribbon Specials on May 7 to carry patrons to and from the store free of charge between the hours of 9 a.m. to 10 a.m. and between the hours of 2 p.m. and 3 p.m. "The Big Store" engaged the services of every car in Jacksonville and south Jacksonville.

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Celebrates Safety Broadcasting

Nashville Railway & Light Company entertains in a two hour program. General manager states purpose of educational method. Others speak on safety

COMMEMORATING the first anniversary of its safety department broadcasting its meetings and messages to the public, the Nashville Railway & Light Company, Nashville, Tenn., recently held a two-hour program over station WLAC. Present were Joel B. Fort, representing the state; Gen. J. Washington Moore, the city; William Gupton, the school children of Nashville; Charles Peay of the Nashville Automobile Club; A. M. Burton of the Life & Casualty Insurance Company's radio station, and more than 100 others in addition to the 400 Nashville street car operators. The exercises opened with the program of the Rail-Light band. A choir of the Edgefield Baptist Church sang and there were also other features by the Rail-Light employees.

Telling Tennessee the safety story

Reason for Fewer Accidents

J. P. W. Brown, vice-president and general manager of the company, made the salutatory address. He said the chief aim had been the spread of the gospel of safety and to stress the need of safety education in order to cope with the rapidly growing dangers of the street and highway. In addition to that branch of safety the company was also interested in industrial, home or any other branch of safety that would make the city and country a better and safer place in which to live. He said that the operators of the Nashville cars had for the past several years made records comparable with any others that he could find and that in the last year, 1927, less than 30 per cent of accidents was chargeable in whole or in part to the negligence of the street car operators. During the year 400 automobiles struck street cars at the rear, sides or in front while the cars were standing. These were carried on the records as accidents and it was this type of accident his company had hoped to decrease by broadcasting the need for safety. During the past eight years the operators had reduced their total accidents from 2,800 to 900.

Mr. Brown introduced Col. Joel B. Fort, representing the Governor of Tennessee. Mr. Fort traced the industrial safety movement in America and discussed the annual saving in money. William Gupton, president of the City Board of Education, said that safety was chiefly an educational matter and that everyone should recognize his obligation to further the great and worthy movement in order to make the country safer and conserve the lives of the young boys and girls.

Insurance Man Praises Company

City Attorney Moore said that there was yet much to be done in the field of accident prevention. He praised the results that had been accomplished through traffic regulation, truck-driver schools, conducted by the Safety Department of the Chamber of Commerce, and by penalties imposed by the courts on reckless and careless drivers.

In the opinion of A. M. Burton, president of the Life & Casualty Insurance Company, the citizens of Nashville and surrounding country owed much to the Nashville Railway & Light Company for the great movement of "Safety First," the need for which it had been trying so earnestly to impress upon the public. He said that congratulations were in order for the far-reaching method adopted by that company for promulgating this safety propaganda. He said that in addition to the stimulating influence for public safety, the musical and entertainment features of the program had been very wholesome and had brought happiness and sunshine to the hearts of a wide circle of friends.

Reduced Rates for Pacific Electric Employees

Employees of the Pacific Electric Railway, Los Angeles, Cal., are reminded that special books of tickets—five for $1—good for employee and dependent members of his or her family, can be obtained at the Redondo Beach Bath House, by presentation of railway pass or club membership card. Tickets include use of suit, towels and locker. Also books of dance tickets—40 for $1—can be obtained in the same way from the supervisors in the ballroom.

Connecticut Wage Issue at Standstill

Employees of the Connecticut Company, New Haven, Conn., have rejected a continuation of the wage agreement which terminated on June 1 and the company is against arbitrating, feeling that in view of a decrease in living expenses, present wages are adequate. An attempt was made to bring about an amicable settlement when officials of the railway were in conference with representatives of the employees. However, no progress was made and subsequent to that action a vote of the men disclosed two-thirds were in favor of authorizing the union officials to declare a strike if necessary.

New Group Insurance in New Jersey

Thomas N. McCarter, president of the Public Service Railway, Newark, N. J., in connection with the 25th anniversary of the corporation announced on June 15 that the employees of the corporation and its subsidiaries will have an opportunity to double the amount of life insurance carried under the group insurance plan at a substantial reduction in premium.

Judge Named for Piedmont & Northern Hearing

An order naming Judge Morris A. Soper to sit in the case of the Piedmont & Northern Railway in the United States Court for the Western district of South Carolina, has been issued. The Piedmond & Northern is seeking in federal court to have a ruling of the Interstate Commerce Commission set aside refusing the electric railway authority to extend its lines in South Carolina and North Carolina. An order of Judge Edmund Waddill, Jr., senior circuit judge of the Fourth Federal circuit, appointed Judge Soper to sit in the place of Judge H. H. Watkins, Anderson, S. C., who disqualified himself on the grounds of previous legal connections with a railway concerned in the suit. Coincidentally with announcement of Judge Soper's appointment, it was made known that counsel for the Piedmont & Northern had asked the court that three judges sit in the case.

Recently, seven steam railroads operating in the Carolinas filed a petition in federal court, asking to be made "parties defendant" with the government in the suit, declaring that they were "directly and indirectly" affected by the proposed extensions of the electric railway.

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Franchise Draft Accepted in Omaha

The Omaha, Neb., City Council has accepted the draft of a new franchise for the Omaha & Council Bluffs Street Railway drawn by Corporation Counsel Van Dusen. J. N. Shannahan, president of the company, says that while it contains features that were objectionable, the city has shown a desire to cooperate with the company in maintaining railway service, and that if voted by the people next November the grant will be accepted by the company. He thinks that its provisions are such that the company will be able to refinance itself and continue service. Mr. Shannahan expressed pleasure over the amicable settlement, commending the city for fairness and evidence of its intention to retain service within the municipality.

The franchise has a life of 30 years, and while amendable by the city a change can be made only when it is vitally important for the interests of both parties to the contract. The franchise is not exclusive, and levies upon the company the old obligations with respect to grading and paving where streets are improved or resurfaced. Extension of lines may be ordered by the city, while the company cannot change from car service to bus service without Council permission. The company may utilize bus service where this type is agreed as and is jointly desirable. The city abandons its old contention for free rides for certain classes of employees.

Zone System in Cleveland Sought

Joseph H. Alexander, president of the Cleveland Railway, addressed a letter to the City Council of Cleveland, Ohio, under date of June 18, inviting the Council to try a zone system of collecting fares for a period of not less than 90 days. He took this action in accordance with recommendations of the board of arbitration which recently raised the fare in East Cleveland, so that for the next five years it will always be higher than the Cleveland rate of fare, rising or falling with the Cleveland rate. The board of arbitration predicted the eventual scrapping of the Tayler plan if a zone system were not adopted.

Mr. Alexander proposed that the Council set up an inner and outer zone. The fare within both zones would be governed by the condition of the interest fund, as at present, rising when the interest fund goes below $500,000, and going down when the interest fund passes the $1,100,000 mark. For a through ride between the zones he suggested that the same schedule of fares prevail as that fixed by the arbitrators for East Cleveland in the case recently decided by them.

This would in effect establish a 9-cent fare for certain outlying sections of Cleveland, such as West Park and Collinwood. All crosstown lines and a number of the main lines would be wholly within the inner zone.

It is not expected that the Council will consider the proposal seriously unless some arrangement is made to put the high rate of fare in effect in Cleveland Heights and Lakewood, two of the major suburbs.

Increased Fares in Galveston

City Commissioners of Galveston, Tex., have adopted ordinances increasing car fare rates of the Galveston Electric Company. The ordinance provides for a sliding scale of fares from 10 cents to 5 cents. On June 30, 1927, the company submitted to the Mayor, City Commission and to the public a statement of its financial status indicating the unprofitableness of the railway lines. Later an adjustment in fare schedules was suggested by the company.

Situation in Rome, Ga., Will Be Studied

Decision in the case of the Georgia Power Company asking permission to increase fares in Rome, Ga., has been deferred by the Public Service Commission until a more thorough investigation can be made. The company proposes to increase its cash fare to 8 cents and to sell two tickets for 15 cents, with changes in the rates to school students as well. The petition stated that, with the present rates, the railway was losing money and was supported by the Rome Chamber of Commerce and representatives of the City Commission. On the other hand, a vigorous protest was made by two citizens of Rome in behalf of "the poor people of the city." They filed a detailed statement charging that the railway department might be losing money, but that the sale of power was more than profitable for the company.

St. Louis-Kansas City Line Permit Again Denied

The Missouri Public Service Commission at Jefferson City has again denied the application of the St. Louis-Kansas City Short Line Railroad for a certificate of convenience and necessity for the construction and operation of an electric interurban railroad connecting St. Louis and Kansas City. After the first application of the railroad was denied in May, 1925, a second application was filed with the commission on Oct. 7, 1927, and many hearings were held.

The ruling of the commission was that the showing of the proposed railroad as to revenues that could be earned to support it was not sufficient to warrant granting the certificate. Commissioner John H. Porter, who wrote the decision, further held that the commission was not satisfied with the financial structure of the proposed 237 mile railroad.

Steam railroads operating between the two chief Missouri cities opposed the proposed electric line.

Seattle Official Takes Rest

D. W. Henderson, superintendent of the Seattle Municipal Street Railway, Seattle, Wash., has applied for and received permission from the City Council for an extended leave of absence, on account of illness and to provide a needed rest. Mr. Henderson has been in active charge of the operations of the municipal lines in Seattle since the road there was taken over by the city from the Puget Sound Power & Light Company, by which he was formerly employed.

Mr. Witt Thrives on Politics

Peter Witt, former street railway commissioner of Cleveland, Ohio, and inventor of the Peter Witt car, is a candidate for the Democratic nomination for Governor of Ohio at the primaries on Aug. 14. He is running on an "elect Al Smith" platform.

Last December Mr. Witt completed four years of service in the Cleveland City Council. He was not a candidate for re-election and announced he had made up his mind to keep out of politics. But recently a group of his friends at the City Club at noon got up a petition nominating him for Governor and by nightfall Mr. Witt had decided to run.

Nation's Traffic Award Made to Two Railway Men

Two railway men were among the victors in *Nation's Traffic* national traffic contest and received prizes from the Committee of Awards which met in St. Louis May 21 and 22 to judge the several hundred manuscripts entered. The first award of $2,500 for "Text for Uniform Traffic Ordinance" was divided in equal amounts between Walter W. Kennedy, assistant to the vice-president of the Birmingham Electric Company, Birmingham, Ala., and Robert H. Nau, secretary of the street traffic committee, Chicago Association of Commerce, Chicago, Ill. The award of $1,000 for "Plan for the Solution of Municipal Parking Problems" was won by Leon R. Brown, safety engineer of the New York State Railways, Rochester, N. Y., and chairman of the traffic committee of the Rochester Engineering Society. Other awards dealt with traffic violators and adult and juvenile education.

The eight participants were awarded a total of $6,850. The significance of the contest, according to *Nation's Traffic* was evidenced by the number of prominent men who deemed it of sufficient importance to devote time to it.

In the report of the Committee of Awards it was stated that outstanding plans or suggestions of a practicable and generally useful nature other than those which have been the subject of past experiments were not presented in this contest; also that several of the suggestions to which awards had been made were not so complete or so competent as might be produced by combinations of plans now in effect in different parts of the country.

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Recent Bus Developments

Modified Proposals in Knoxville

The motor bus committee of the City Council of Knoxville, Tenn., has received a new proposition from the Knoxville Power & Light Company for the operation of buses in co-ordination with street cars. That company now has two proposals before the city.

The first one was to establish four bus routes, to be known as the Sevierville Pike, Beaumont, Whittle Springs and Lonsdale routes. The company proposed that riders getting on street cars and transferring to buses pay 4 cents extra for transfers, in addition to the 6-cent token. Riders who boarded buses first would pay 10 cents whether or not they transferred to street cars.

The Council committee then demanded that Power-Light eliminate the 4-cent transfer, give school children 5-cent fare, and relocate the Kingston Pike street car line to the middle of the pike. The company in its reply refused to eliminate the 4-cent transfer, but agreed to relocate the track if the city would pay half the cost. The city refused, and City Manager Roehl intervened and asked for further time. Mr. Roehl presented this proposition from Power-Light:

First, Power-Light agrees to put on the four bus lines recommended by the City Planning Commission, provided the city would grant franchises over the routes subject to approval of the company's legal department.

Second, the company will abandon its Kingston Pike right-of-way so the pike can be widened and paved by the city, and agrees to put on a trackless trolley on present Lyon's View route, if the city will give the necessary franchise which would be subject to approval of the company's attorney. The city was asked to let the present tracks remain until the pike is paved. All obligations against the company for paving cost on the pike would be eliminated.

Third, sanction by the city of a 7-cent token fare, with a universal free transfer from street cars to buses, and vice versa.

C. H. Harvey, president, said the Knoxville Power & Light Company would put on the trackless trolley under either the original or alternative proposition.

Applications and Opposition in St. Louis

The St. Louis, Mo., Board of Public Service held a public hearing on the application of the People's Motorbus Company on June 13 for a permit to operate buses on Oakland Avenue westward from Kingshighway to the Zoo in Forest Park. Opposition was voiced by the St. Louis Public Service Company because the proposed bus line would compete with its Market car line in the territory south of Forest Park. At the hearing the railway asked to operate a bus line of its own from Arsenal Street into the Lindenwood district, now served by the Russell Boulevard-Southwest Avenue line of the People's Motorbus Company.

The People's Motorbus Company has also applied for a permit to operate a 5-cent loop bus line to the levee for the convenience of river excursionists.

New Service in Prospect on Indiana Line

Five new 21-passenger buses will be put into operation shortly by the Evansville & Ohio Valley Railway. Three of these will replace electric railway service between Evansville and Mt. Vernon, Ind.

Acquisition of Bus Line by Roanoke Railway

Control and management of the Safety Motor Transit Corporation, Roanoke, Va., has passed from the hands of the former officers of the corporation to these of the Roanoke Railway & Electric Company. Officers of the Safety Motor Transit Corporation have resigned, but it is understood that the employed force will be retained practically intact by the owners.

Plan in Seattle Suburb Under Consideration by New Regime

The proposition of starting a combination bus and railway service to provide more adequate transportation to the suburban district of Green Lake, Seattle, Wash., which has been under consideration for months, has been temporarily abandoned. A plan evolved by D. W. Henderson, superintendent of railways, and approved by the City Council utilities committee, has been turned over for consideration to the new administration, headed by Mayor Frank E. Edwards, who succeeded Bertha K. Landes, on June 4.

Washington Company Buys Suburban Line

The Washington Railway & Electric Company, Washington, D. C., has announced that it has brought to a successful termination the negotiations involving the purchase of the Montgomery County bus line. Since this bus line parallels one of the railway company's suburban lines, the services may be coordinated. Under the terms of the purchase agreement, the bus line retains its corporate identity. The bus line is owned and controlled entirely by citizens of Rockville. Four buses have been making thirteen round trips a day between Washington and Rockville, Md.

Would Seek Certificate in San Bernardino

The Pacific Electric Railway has applied to the California Railroad Commission for a certificate to operate motor coach passenger service between its Third Street station and Pickering Park in the city of San Bernardino.

Jitneys Barred in Louisville

Announcement was made in Louisville, Ky., on June 18 that jitney buses would be eliminated from the streets of Louisville on July 1. Such transportation was first established in Louisville about fifteen years ago, and while it has never amounted to a great deal in the better-class sections of the city, there have been a good many buses on Market Street, which carries two of the best revenue-producing lines of the Louisville Railway. Mayor Harrison after a conference with James P. Barnes, of the Louisville Railway, and City Attorney James P. Baskett, in a formal statement to the press, stated that he would confer with the City Attorney and Board of Safety looking to the enforcement of that part of the traffic code on jitney elimination.

Under decision of the Court of Appeals last year no bus may operate in Louisville without a franchise, and the Louisville Railway holds the bus franchise and is operating several lines. City officials expressed the opinion that the jitneys were being illegally operated. Under a new traffic ordinance that is now in effect, they are barred from the streets, unless under franchise.

Mayor Harrison, just back from the Republican Convention in Kansas City, commented on the fare there being 6⅔ cents for tickets, and 8 cents cash; 10 cents bus, with free transfer privilege; and 15-cent bus fare where the bus follows the car line.

Service Improves in Oklahoma City

The entire system of the Oklahoma Railway, Oklahoma City, Okla., was brought closer together by the establishment of the new Seventeenth Street Loop cars and the increase in service in the northwest section. In line with the scheme of bus operation in other large cities, two bus routes have been made feeder lines. Bus service on the lines affected is at closer intervals during the day than formerly, while street car schedules are also much increased. The routing and scheduling of cars made the entire system more accessible by eliminating the necessity for cross-town passengers to come all the way downtown through traffic and back and speeded up service over the entire line. Northwest Oklahoma City, where the first improvements in car and bus service were offered to the public as the result of recent surveys made by the railway, has been highly pleased, according to a canvass of the routes made recently.

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Financial and Corporate

Underlier Hearing Started

Commission begins inquiry into possibility of city purchasing Philadelphia Rapid Transits' leased lines

HEARINGS were started on June 18 before the Pennsylvania Public Service Commission on the application of the City of Philadelphia for placing of valuation on properties of the underlying companies making up the Philadelphia Rapid Transit Company system, as a step looking to their condemnation by the city.

At the outset Commissioner Benn read a statement which follows in part:

The proceeding before the commission is unusual and, so far as we are able to determine, without precedent. We are not called upon, as the Public Service Commission, or in any other capacity, to express approval or disapproval of the condemnation of the properties of the underlying companies. The commission's certificate of public convenience is not asked for, nor is it necessary, and the commission's regulatory or administrative judgment is not invoked or involved in this proceeding.

It is possible, even probable, that later proceedings must be taken under the provisions of the Public Service Company law in the event that the city consumates the condemnations authorized by the Legislature. Not until then, in this matter, will the commission function under the provisions of the act of July 26, 1913, and its supplements.

As we view the Act of 1927, the only parties who have the right to appear at this hearing and be made parties to the record are the city of Philadelphia and the underlying companies named in the petition. The sole duty or function of the commission under this act is to determine the compensation or damages to be paid by the city to the owner or owners of the property.

In a friendly action, in which counsel and officials of the underlying companies have joined with the city solicitor and his staff, the commission has been petitioned to appraise the holdings of the underliers and fix a fair price for their acquisition by the city.

Under the McChord plan, which was submitted last year to the commission and the city, the city, it was said, could effect a saving of $4,500,000 a year by substituting itself as lessor in place of the underliers and collecting the approximately $9,000,000 which the P. R. T. pays each year to those systems in rentals. The price recommended to be paid for the underliers by Mr. McChord was $136,000,000 and not $36,000,000 as was made to appear in the JOURNAL for June 16.

The underliers have formed four committees to represent the stockholders of the lessor companies.

At the opening hearing city Solicitor Ashton moved that the commission issue an order on the underlying companies party to the valuation calling on their representatives to answer within 30 days the city's petition, filed with the commission, announcing its "declaration of intention" to take over the franchises by condemnation.

The order was issued accordingly, and counsel for the underliers announced that they would file answer within that time. The city, Mr. Ashton said, is prepared to proceed with the hearings meanwhile, and Mr. Benn announced in conclusion that if the underliers assented, a date convenient to all would be fixed for the next session.

Mr. Maltbie Retained in Washington Case

Milo Roy Maltbie, former Public Service Commissioner of New York, has been retained in connection with the valuation survey of the railway lines and the bus company in Washington, D. C., which it is intended shall be consolidated. The matter was before the District of Columbia committee of the Senate at the recent session of Congress, and was referred to a sub-committee for a report in the fall. The railways fixed a valuation figure of $50,000,000 on their properties, but contended that under allowances made in other valuation cases their holdings would scale $62,000,000.

Pennsylvania Line Suspends Service

The Fairchance & Smithfield Traction Company, Uniontown, Pa., ceased operation on May 14, 1928. Receipts had been less than expenses since January of this year. Proceedings are pending for dissolution of the company. Trackage covers 2.75 miles.

Preferred Stock Offered in St. Louis

The Missouri Public Service Commission has authorized the St. Louis Public Service Company, St. Louis, Mo., to issue 27,000 shares of Series A preferred 7 per cent stock to be used in conversion of approximately $2,250,000 of five-year gold notes issued when the company took over the properties of the defunct United Railways. The conversion must be made before Dec. 31, 1928.

Short Abandonment in Washington Authorized

Permission to abandon about 3 miles of track of the Spokane, Cœur d'Alene & Palouse Railway, formerly in the Inland system, has been granted the Spokane, Wash., company by the Interstate Commerce Commission. About a third of a mile is within the Spokane city limits and about 2½ miles is east of the city limits.

Upward Trend in Recent Income Statements

For the eleven months ended May 31, 1928, gross revenue of the Interborough Rapid Transit Company, New York, N. Y., was $61,886,726, an increase of $3,747,409 over the eleven months ended May 31, 1927. The balance after consideration of dividend rentals was $2,949,612, representing an increase of $1,583,939 over a similar period of 1927.

On the Brooklyn-Manhattan Transit System, Brooklyn, N. Y., total operating revenues were $43,411,306 for the eleven months ended May 31, 1928, compared with $42,735,617. The net income after total income deductions was $5,938,320 for this year's period compared with $5,805,322 for a similar period of last year.

International Railway, Buffalo, N. Y., reports to the New York State Public Service Commission for the quarter ended March 31, 1928, net income of $123,048 after fixed charges compared with net loss of $124,888 in the corresponding quarter of 1927.

Operation of the Cincinnati Street Railway, Cincinnati, Ohio, run under a service-at-cost arrangement, for May resulted in a surplus of $1,658. The figures follow: Net operating revenue $213,690; operating income $145,433; non-operating income $1,938; gross income $147,371; rental, interest sinking fund, and return on capital $145,713; surplus $1,658.

The United Electric Railways, Providence, R. I., reports for May net income of $42,606 against $28,863 in May 1927. Net income for five months ended May 31, 1928, was $252,275 against $243,305 in the similar period of 1927.

The Chicago Surface Lines carried 138,464,269 passengers in May, compared with 133,359,809 in April and 133,938,656 in May, 1927. Revenue passengers carried showed an increase of 1,482,650 over the same period last year. The largest number of passengers carried in any one month was in March, 1928, when 139,179,092 riders were transported.

Gross for May of this year was $5,304,553 against $5,205,735 in the similar month in 1927. Divisible receipts for the month totaled $465,245 against $452,579 in May of last year. These divisible receipts are the largest reported since December of last year.

Maine Branch Line to Be Abandoned

The Biddeford & Saco Street Railway, Biddeford, Me., has announced that the branch line between City Square and West Street will be discontinued on June 30. Last winter there was much public opposition to abandoning this line. Many persons who own automobiles have since taken occasion to ride the trolleys whenever possible so that the line might be continued. Despite the aid of a loyal public the management has found the line does not derive sufficient revenue to pay operating expenses.

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City Supervisor Commends Dallas Railway

During the year ended April 30, 1928, the Dallas Railway & Terminal Company, Dallas, Tex., completed and put into operation 2.9 miles of extensions and 8.8 miles of bus lines. Everman Plan No. 4 was completed with the exception of the Junius Height extension held up by legal proceedings. These facts were contained in the report of John W. Everman, the Supervisor of public utilities of the city of Dallas. He stated that the four utility companies worked closely with the department and in co-operation with each other in all matters looking to the interests of the city.

The report says that the railway service is generally satisfactory, the company exerting every effort to keep it up to a high standard. Both the number of cars in operation and the total mileage in the past year have been increased. The speed of cars has been increased from 9.10 m.p.h., last year to 9.28 this year.

In reviewing the statistics of the road, Mr. Everman said that the company was operating 121.83 street car track-miles and 13.2 bus-miles, that 102 double-truck one-man cars were in operation, of which 50 were rebuilt and placed in service during 1927.

During the past year the company rebuilt and repainted the 62 one-man Birney cars and also overhauled and repainted 50 of the practically new 60 Peter Witt cars. The other ten will go through the shops for similar improvement in the near future. Outstanding improvements and betterments to track and right-of-way in the way of extensions, rebuilding of tracks, paving and repaving completed in the past year totaled $413,672 in cost, and improvements made over and above the ordinary maintenance cost $75,000.

The report refers to the company's application to the Mayor and Board of Commissioners for increase in existing fares and the withdrawal of the petition following a recommendation made by a citizens' committee that it take this action. No change was made and the rates at the time the application was made, are still in effect as follows:

Adults, 7 cents cash.
Adult ticket fare, five for 30 cents.
Students' tickets, 3 cents.
Children five to twelve years of age, 3 cents.
Free universal transfer.

Later certain matters which had been under consideration for a long period were satisfactorily adjusted by the company and the supervisor. These included the return to surplus reserve by the company of $41,922, representing an amount heretofore withdrawn from surplus reserve over and above the current 7 per cent fixed return credited to the deficit in fixed return; and also full settlement was made as between the Dallas Power & Light Company and the Dallas Railway & Terminal Company covering bills for power rendered dating back to June, 1921, and governing in the future in rendition of bills until further notice. In rendering these bills originally there was a misinterpretation of the order setting forth the rate to be charged and in the final adjustment the companies accepted the supervisor's interpretation and the Dallas Power & Light Company returned $245,577 to the Dallas Railway & Terminal Company. This sum was credited to surplus reserve of the Dallas Railway & Terminal Company.

Changes in Conspectus of Indexes

Three changes will be noted this month in the Conspectus of Indexes which is compiled for the ELECTRIC RAILWAY JOURNAL by Albert S. Richey, Worcester, Mass. One of these changes consists of the inclusion of an index which is entirely new to the Conspectus, the second is in the form of one of the indexes, and the third is a change in the period covered by the peak figures. These changes are shown in the accompanying table.

The Industrial Activity Index of the *Electrical World* is now included in the Conspectus. This index is based on the amount of electrical power used for power purposes by industrial concerns in the United States, and is referred to the average monthly index for the years 1923-1925, inclusive, as a base. It is corrected for the number of days in the individual months and by the elimination of Sundays and general holidays. This index represents the relative daily use of electrical power by manufacturing industries, and is generally considered a very good index of industrial activity in the country as a whole. It should be of considerably greater value than the monthly figure of Unfilled Steel Order tonnage, which it replaces.

Beginning with this number, Bank Clearings outside of New York City are shown as an index number (with the average of 1926 as a base) instead of the dollar figure in billions as heretofore. Bank clearings in 126 cities outside of New York City are included, and in the calculation of the index the average daily figure is used, eliminating Sundays and nine general holidays. The index is also corrected for the seasonal variations which occurred in the years 1923-1927, inclusive. The new index form should be of considerably greater value than the uncorrected dollar figure which has been shown heretofore.

The last two columns of the Conspectus now show the high and low figures for the last preceding five years instead of since the World War, as formerly. The years 1919-1922 included abnormal fluctuations of several of the indexes, principally due to the violent changes in the readjustment of affairs immediately following the close of the war. Since 1923 there have been no such abrupt changes and most of the indexes have been following trends which now may be considered as more or less normal. For this reason it is believed that at present there will be more interest in a presentation of the high and low peaks for the last five years.

Conspectus of Indexes for June, 1928

Compiled for Publication in ELECTRIC RAILWAY JOURNAL by

ALBERT S. RICHEY
Electric Railway Engineer, Worcester, Mass.

	Latest	Month Ago	Year Ago	Last 5 Years High	Last 5 Years Low
Street Railway Fares* 1913 = 4.84	June 1928 **7.62**	May 1928 **7.62**	June 1927 **7.44**	May 1928 **7.62**	May 1923 **6.88**
Electric Railway Materials* 1913 = 100	June 1928 **141.4**	May 1928 **140.4**	June 1927 **143.0**	April 1923 **175.3**	Feb. 1928 **139.5**
Electric Railway Wages* 1913 = 100	June 1928 **229.2**	May 1928 **229.2**	June 1927 **227.5**	May 1928 **229.2**	March 1923 **206.8**
Am. Elec. Ry. Assn. Construction Cost (Elec. Ry.) 1913 = 100	June 1928 **202.7**	May 1928 **201.9**	June 1927 **200.6**	March 1924 **206.8**	Jan. 1923 **187.3**
Eng. News-Record Construction Cost (General) 1913 = 100	June 1928 **206.2**	May 1928 **207.0**	June 1927 **205.6**	March 1924 **224.7**	Nov. 1927 **202.0**
U.S. Bur. Lab. Stat. Wholesale Commodities 1926 = 100	May 1928 **98.6**	April 1928 **97.4**	May 1927 **93.7**	March 1925 **104.8**	April 1927 **93.7**
Bradstreet Wholesale Commodities 1913 = 9.21	June 1928 **13.19**	May 1928 **13.44**	June 1927 **12.43**	Dec. 1925 **14.41**	July 1924 **12.23**
U. S. Bur. Lab. Stat. Retail Food 1913 = 100	May 1928 **153.8**	April 1928 **152.1**	May 1927 **155.4**	Nov. 1925 **167.1**	May 1924 **141.0**
Cost of Living Nat. Ind. Conf. Bd. 1914 = 100	May 1928 **161.5**	April 1928 **160.8**	May 1927 **163.7**	Nov. 1925 **171.8**	Feb. 1923 **157.5**
Industrial Activity Elec. World—Kw.-hr. used 1923-25 = 100	May 1928 **119.0**	April 1928 **119.3**	May 1927 **122.5**	Feb. 1928 **127.7**	July 1924 **73.4**
Bank Clearings Outside N. Y. City 1926 = 100	May 1928 **108.4**	April 1928 **105.6**	May 1927 **102.4**	May 1928 **108.4**	Aug. 1923 **81.6**
Business Failures Number	May 1928 1748	April 1928 1672	May 1927 1617	Jan. 1924 2231	Aug. 1925 1353
Liabilities (Millions)	**36.64**	**41.13**	**39.92**	**122.95**	**27.22**

*The three index numbers marked with an asterisk are computed by Mr. Richey, as follows: Fares index is average street railway fare in all United States cities with a population of 50,000 or over except New York City, and weighted according to population. Street Railway Materials index is relative average price of materials (including fuel) used in street railway operation and maintenance, weighted according to average use of such materials. Wages index is relative average maximum hourly wage of motormen, conductors and operators on 136 of the largest street and interurban railways operated in the United States, weighted according to the number of such men employed on these roads.

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London Reports Good Year—1,668,827,029 Passengers

In reporting upon the operations of the London Underground group, Lord Ashfield, chairman, said 1927 constituted a record for that group of companies. The group covers the Metropolitan District Railway, London Electric Railway, City & South London Railway, Central London Railway and London General Omnibus. The number of passengers carried was almost 1,669,000,000 and in addition 604,000,000 passengers were carried by other companies with which the Underground is associated. He said the local traffic in London was exceeded only in New York. The number of passengers carried by the London Underground group increased 110,000,000 over 1926. These facts were disclosed at an ordinary general meeting held on Feb. 23.

Gross traffic receipts for the year were £13,951,391 representing an increase over 1926 of £753,764. Miscellaneous receipts amounted to £978,325, an increase of £51,215 over 1926. This was attributed to the successful way in which the commercial advertising was handled. Gross receipts of the group for the year were £14,929,716. Managing Director Ashfield explained the distribution of this sum of money. The average rate of return for the year was 4.66 per cent against 4.09 per cent a year ago, which he claimed was "short of that reasonable return to which we are fully entitled."

He summarized the gains of the year stating that the car-miles run by trains and omnibuses had increased by 21,000,000 but the cost per mile had decreased by 7 per cent. The company had £50,000 more carried to reserve, £236,000 more paid away on the prior charge securities, £112,000 more distributed in dividends and £108,000 more carried forward, representing in all £506,000. This confirmed Lord Ashfield's statement that the year 1927 was a better one than at first might appear from the annual accounts and returns.

COMPARATIVE STATEMENT OF THE OPERATING RESULTS OF THE LONDON UNDERGROUND GROUP, YEAR 1927, COMPARED WITH 1926

	Railways Total 1927 £	Railways Total Increase £	London General Omnibus Company, Ltd. 1927 £	London General Omnibus Company, Ltd. Increase £	Total 1927 £	Total Increase £
Traffic receipts after the operation of the common fund under the terms of the London Electric Railway Companies' facilities act agreement, dated Dec. 21, 1915, and supplemental agreement, dated Dec. 8, 1921	5,404,659	578,745	8,546,732	175,019	13,951,391	753,764
Expenditure	3,225,350	217,454	8,061,259	62,344	11,286,609	279,798
Net receipts	2,179,309	361,291	485,473	112,675	2,664,782	473,966
Miscellaneous receipts, net	596,329	58,630	381,996	*7,415*	978,325	51,215
Net income	2,775,638	419,921	867,469	105,260	3,643,107	525,181
Interest, rentals and other fixed charges	1,433,289	210,669	259,845	25,510	1,693,134	236,179
Balance	1,342,349	209,252	607,624	79,750	1,949,973	289,002
Appropriation to reserve for contingencies and renewals	185,000	30,000	345,000	20,000	530,000	50,000
Balance	1,157,349	179,252	262,624	59,750	1,419,973	239,002
Dividends on guaranteed and preference stocks	389,477	.....	.....	.....	389,477	.....
Balance	767,872	179,252	262,624	59,750	1,030,496	239,002
Add balance from last year's accounts	242,191	*15,482*	64,125	*3,376*	306,316	*18,858*
Total amount available for dividends on ordinary stocks and shares and for other purposes	1,010,063	163,770	326,749	56,374	1,336,812	220,144
Dividends on ordinary stocks and shares	681,718	77,615	240,625	34,375	922,343	111,990
Rate per cent, per annum	4	.46	7 (Free of Tax)	1	4.66	.57
Balance carried forward to next year's accounts	328,345	86,155	86,124	21,999	414,469	108,154

Italics denote decrease.

MISCELLANEOUS STATISTICS OF LONDON UNDERGROUND GROUP FOR YEAR 1927 COMPARED WITH 1926

	Railways Total 1927	Railways Total Increase	London General Omnibus Company, Ltd. 1927	London General Omnibus Company, Ltd. Increase	Total 1927	Total Increase
Passengers carried—						
Ordinary	234,594,270	24,124,062	1,323,423,819	74,070,591	1,558,018,089	98,194,653
Workmen	57,872,186	7,291,622	.....	.....	57,872,186	7,291,622
Seasons	52,936,754	4,209,252	.....	.....	52,936,754	4,209,252
Total	345,403,210	35,624,936	1,323,423,819	74,070,591	1,668,827,029	109,695,527
Average daily number of passengers carried	1,020,393	98,820	3,909,672	196,884	4,930,065	295,704
			Miles			
Route-miles owned or leased	78	.775	...	...	78	.775
Route-miles run over by companies' trains	128	.281	...	...	128	.281
Road-miles run over by companies' omnibuses	...	....	880	20	880	20
Number of stations	125	.....	...	...	125	...
Number of garages	...	.....	46	2	46	2
Number of elevators	171	.....	...	...	171	...
Number of escalators	67	4	...	...	67	4
Number of car-miles run in relation to passenger receipts	79,005,322	13,607,193	146,283,963	7,499,788	225,289,285	21,106,981
Number of car-miles run by companies' trains or omnibuses	86,038,811	13,731,157	146,283,963	7,499,788	232,322,774	21,230,945
Number of cars or omnibuses owned	1,793	23	*3,990	55	5,783	78

*The number of omnibuses owned and/or worked by or in conjunction with the London General Omnibus Company, Ltd., is 4,887, compared with 4,703 in 1926.

Preferred Issue of Philadelphia Rapid Transit Increased

Stockholders of the Philadelphia Rapid Transit Company, Philadelphia, Pa., on June 18 approved an increase of $5,000,000 in the preferred stock, bringing the authorized total to $35,000,000. Proceeds from the sale of the increased preferred will be used to relocate the Market Street subway tracks under City Hall, for the erection of a bus terminal building and establishment of a garage terminal.

Common stockholders were asked to waive their rights to subscribe to the new preferred. Unless waived, rights go to stockholders of record June 22 in the ratio of one new preferred share for each six of the common held.

Riding on Increase in Los Angeles

Traffic by both bus and street car on the lines of the Los Angeles Railway, Los Angeles, Cal., for the five months' period ended May 31, last, reached a total of 148,155,565 passengers. This is an increase of 2,823,800 passengers, or approximately 2 per cent, over the volume of traffic in the similar period of last year, which totaled 145,331,765 passengers.

Bus traffic figures for the period aggregated 7,098,486 passengers, as compared with 5,508,276 in the similar period of 1927, a gain of 1,590,210, or nearly 3 per cent. Passengers by street car numbered 141,057,079, against 139,823,489 in the corresponding period of last year, an increase of 1,233,590 fares, or nearly 1 per cent.

On May 4, the Los Angeles Motor Coach Company was organized jointly by the Los Angeles Railway and the Pacific Electric Railway and a part of the bus transportation system of the Los Angeles Railway, approximating 25 per cent of the traffic, was transferred to this company. The consequent decrease in bus traffic figures for the month of May was not in direct proportion to the cut. This indicates an increase in other lines still under the operation of the Los Angeles Railway.

The number of passengers traveling bus lines in May was 1,148,855. This compares with 1,173,714 in May, 1927, which is a decrease of 24,859 passengers, or slightly more than 2 per cent. Street car traffic for the month showed little change from that in May, 1927, and numbered 28,218,201 passengers, against 28,115,348 last year.

As an indication of the increasing

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popularity of the bus lines, figures for April, before transfer of part of the system to the Los Angeles Motor Coach Company, showed a gain of 3.7 per cent over traffic figures reported for April, 1927. The company is now operating seventeen bus lines, as against sixteen at this time last year. It has just received a permit from the Railroad Commission to extend the Beverly Boulevard line from Vermont Avenue to First Street and Bonnie Brea Avenue.

Deficit in Terre Haute

For the year ended Dec. 31, 1927, the Terre Haute, Indianapolis & Eastern Traction Company, Terre Haute, Ind., realized a surplus of $145,920. From this sum $226,730 sinking fund requirements were subtracted, leaving a deficit of $80,810 for the year. This was disclosed in the annual report submitted at the annual meeting on June 13.

There was expended and charged to capital account on owned lines $41,315 and on leased lines $103,833, making a grand total of $145,148 on owned and leased lines. Considerable reconstruction and improvement work was accomplished on the different divisions of the company.

Freight earnings for 1927 were $603,486 compared with $593,329 in 1926. Total mileage was 430.87 and total main line route mileage 433.07.

MISCELLANEOUS STATISTICS OF THE TERRE HAUTE, INDIANAPOLIS & EASTERN TRACTION COMPANY
Year Ending Dec. 31, 1927

Passengers carried—Interurban lines	3,950,127
Passengers carried—City lines	18,798,477
Total passengers carried	22,748,604
Freight handled, tons	211,741
Express handled, tons	9,541
Car-miles operated—Interurban lines	6,470,379
Car-miles operated—City lines	3,764,611

The report also contains some facts of the leased properties, the Indianapolis & Northwestern Traction, the Indianapolis & Martinsville Rapid Transit Company, the Terre Haute Traction & Light Company, the Terre Haute & Western Railway and the Indianapolis, Crawfordsville & Danville Electric Railway.

EARNINGS AND OPERATING EXPENSES OF THE TERRE HAUTE, INDIANAPOLIS & EASTERN TRACTION COMPANY

	1927	1926
Gross earnings	$5,616,529	$5,611,653
Operating expenses	4,463,122	4,436,221
Net from operation	$1,153,406	$1,175,432
Taxes	$166,108	$181,819

MAINTENANCE EXPENSES OF THE TERRE HAUTE, INDIANAPOLIS & EASTERN TRACTION COMPANY

	1927	1926
Maintenance of way and structures	$778,266	$683,616
Maintenance of equipment	437,050	419,683
Maintenance of power plant Buildings and equipment	108,601	128,313
Total railway maintenance	$1,323,868	$1,231,612
Maintenance of light and power	183,065	185,520
Tota maintenance	$1,506,934	$1,417,132

Personal Items

Toronto Man Association President

D. W. Harvey, responsible operating official of Toronto Transportation Commission, elected to head Canadian Association

D. W. HARVEY has had conferred upon him the highest tribute within the power of Canadian electric railway men to bestow. At the meeting of the Canadian operators held recently in Toronto, he was made president of the Canadian Electric Railway Association. It is a big job that Dave Harvey holds at Toronto. He is responsible for the conduct of 200 miles of electric railway formerly included in the system of the

D. W. Harvey

Toronto Railway, privately owned, and the Toronto Civic Railway, brought together some time ago under the auspices of the Toronto Transportation Commission. He is a very young man to occupy so important a post, particularly as he was only 37 years of age 4 years ago when he was chosen to succeed H. H. Couzens as manager at Toronto.

As if it were not enough for Mr. Harvey to have managed the railway successfully and militantly, the main responsibility has been his of developing the radial lines out of Toronto, the local motor coach services and the special de luxe services. Still more recently the conduct of the municipal ferries has been entrusted to him.

Mr. Harvey and Mr. Couzens were chiefly responsible for rehabilitating the railway lines at Toronto following the taking over of the property of the Toronto Railway, and the measure of success that has followed is undoubtedly due in large part to the fact that both Mr. Harvey and his predecessor were left untrammeled and unusually free from political interference. No left-handed thrust is intended at the Toronto Railway when it is said that the properity to which the city succeeded was in a deplorable condition at the time the city succeeded the private company. The former owners, uncertain of the final disposition of the property, were loath to do more than keep the property going in the face of the political uncertainty.

The first task was to rehabilitate the property physically. This was accomplished with an unusual degree of celerity. That work has been followed on the part of Mr. Harvey and his associates with an intensive campaign to sell the services of the system to the public in which a great deal of resourcefulness has been shown. This is a record that has gone down in black and white in the ELECTRIC RAILWAY JOURNAL from time to time so that he who runs may read.

For seventeen years Mr. Harvey has been serving the city of Toronto. He really began to visualize the city's transportation needs as long ago as 1911, when the first of the so-called civic lines was placed in operation. On that line he was construction engineer. In 1912, when he was only 26 years old, the operation and maintenance of the civic lines were placed under Mr. Harvey's supervision. He continued in these capacities until appointed to be assistant manager of the Toronto System in 1921 after the lines of the Toronto Railway had been acquired by the city.

Mr. Harvey was born in London, Ont., on Feb. 24, 1887. He was educated in the public schools and the Collegiate Institute there. In 1906 he became a student in the Applied Science Faculty at Toronto University, taking the course in civil engineering and graduating in 1910 with the degree of B. A. Sc. In the same year he entered the Ontario Power Company service in Niagara Falls on construction work. In 1911 he was appointed to the City of Toronto Works Department, and had charge of constructing and operating the Toronto Civic Railway until Sept. 1, 1921, when the city took over the Toronto Railway. He was then appointed assistant manager of the Toronto Transportation Commission. On May 1, 1924, on the resignation of H. H. Couzens he was appointed general manager of the commission as the logical successor to that office because of his previous record and his intimate knowledge of the system and the needs of the city.

Resignations on Ohio Property

Earl Lemaster, superintendent of the Newark division of the Southern Ohio Public Service Company, Newark, Ohio, J. A. Hewitt, superintendent of the Zanesville division, and F. J. Clunis, general manager of the midwest section of the company, have resigned effective July 1. Following the announcement of the resignations the statement was made that the Southern Ohio Public

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Service Company had sold to a Chicago corporation, but this has not been confirmed.

It was further announced that Mr. Lemaster will join an eastern interurban company; that Mr. Clunis will go with the Tulsa Interurban, Tulsa, Okla., and that Mr. Hewitt will be similarly employed with a Seattle interurban company in Seattle, Wash. The Southern Ohio Public Service Company was formerly included in the system of the Ohio Electric. It extends from Zanesville to Lima, Cincinnati, Fort Wayne, Columbus and way points.

British Columbia Personnel Unchanged

George Kidd, president of the British Columbia Electric Railway, Vancouver, B. C., has just returned from Eastern Canada where he attended a conference of the purchasers of the company. When he was offered the presidency of the British Columbia Power Corporation, which now controls the British Columbia Electric Railway and all its subsidiaries, Mr. Kidd was assured that the past policy and management of the railway would be continued and that there was not the slightest intention on the part of the new owners of interfering in any way with the rates or affairs of the company as they have been conducted for many years.

His request for a local representation on the board has now been met, with the result that W. G. Murrin, long vice-president of the railway, has been made vice-president of the British Columbia Power Corporation and Mr. Goward will occupy a similar position in Victoria, and Sir Frank Barnard, described as the father of the old British Columbia Electric Railway, also accepted a position on the directorate, together with Blake Wilson.

Mr. Kidd says the price paid by the new owners to the English shareholders for the property is not high, compared with the quotations for other similar utility securities. For purposes of comparison it must be remembered that the shareholders of the old British Columbia Electric Railway were receiving a dividend of 8 per cent free of English income tax, which meant that on the present yield of the other leading public utilities, the stock was worth between $300 and $400, an amount probably in excess of the sum paid for it by the new owners.

The new owners are men who have for many years taken the leading part in the development of public utilities throughout Eastern Canada and have been most successful in developing those utilities and in bringing new industries to absorb the power available. The opinion of the new owners is reflected best, perhaps, in the optimism of Sir Herbert Holt, who has stated that in his opinion Vancouver is destined to become the second city in the Dominion.

F. G. Buffe Honored by Association

During coming year Midwest group will have public relations expert to handle affairs

F. G. BUFFE, vice-president of the Kansas City Public Service Company, Kansas City, Mo., was elected president of the Midwest Electric Railway Association at its meeting in that city, June 4-6. As head of an association, with its countless opportunities for accomplishing much in the human relations field, Mr. Buffe might be called the right man in the right job, for his education, experience, and even inclination, especially equip him to solve association problems and to promote educational and social activities within the fold.

Mr. Buffe is known not only in Kansas City, where he has put into force

F. G. Buffe

some of his advanced notions on cooperative activities and employee representation, but throughout the Middle West his reputation as a public relations man, and as a speaker who has something significant to say remains undisputed. His numerous addresses and papers bespeak the endowments and outlook of the man more than a column of type could do. Significant among these talks was the one delivered before the annual meeting of the Midwest Electric Railway Association held in Denver, Col., July 8-10, 1926. On that occasion he had both the conviction and temerity to talk of rights of employees—that they were entitled to full knowledge of the aims and purposes of their companies if loyal service were expected of them. Mr. Buffe understands the potent influence of the human element in any industry. His study of law and his newspaper experience in Denver and Peoria and subsequent publicity work for the Illinois Traction properties give him the advantageous position of remaining on the outside looking into the industry.

This same detachment enabled him to see the bus as a vehicle with a future. In speaking before the American Society of Civil Engineers in Kansas City, Mo., on April 14, 1926, Mr. Buffe said that the bus offered new opportunities to serve, as well as new problems to solve, and that its proper development would mean a distinct public gain. And the use of the bus by the Kansas City Public Service shows Mr. Buffe meant what he said. His faith in railways never falters, however, evidenced by his letter to the editor of ELECTRIC RAILWAY JOURNAL, published in the issue of May 8, 1926, in the course of which, Mr. Buffe remarked "the very vital necessity of the street railway is the only thing that kept it alive during the period from 1915 to 1920. The industry simply had to carry on because its collapse would have meant disintegration of business values and paralysis of urban life."

It was because of his record of achievements in Kansas City since 1917, the year he became affiliated with the Kansas City Railways, that in the fall of 1926, when the receivership of these properties was terminated, Mr. Buffe, who served as general manager throughout the receivership, was elected vice-president in charge of operation of the newly-formed Kansas City Public Service Company.

Mr. Buffe was born in Illinois, went to college there, and received his early training under H. E. Chubbuck, then vice-president of the Illinois Traction System. His intensive training on that system in his early years gave him a large capacity for work, but this has never negatived his desire for fun nor militated against his natural ability to fraternize broadly. Unless memory is at fault motor-boating was one outlet for his exuberance and those delectable days on board were lived also by the readers of the George Fitch tales of motor boating on the Mississippi.

Obituary

FRANK HENRY BROWN, of Pawtucket, R. I., superintendent of the northern division of the United Electric Railways, died on June 19. Mr. Brown had been employed in street railway work since he was nineteen years old, and had been 21 years with the United Electric Railways. He had worked for several years in Worcester, Mass., and in New Jersey. His superintendency at Pawtucket was later extended to Woonsocket and to Providence. Mr. Brown was born in Providence 57 years ago.

CHARLES A. WARNER, superintendent of track and overhead department of the Muskegon Traction & Lighting Company, Muskegon, Mich., died on May 18. He began working for the transportation company as a section hand in 1889, during the days of horse-car operation. In three years he won promotion to the position he held at the time of his death. He helped install the overhead system for electric operation of cars started in May, 1890. Mr. Warner was born on Dec. 18, 1861, in Sweden.

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Manufactures *and the* Markets

Crouse Heads Electrical Manufacturers

Huntington B. Crouse, president of the Crouse-Hinds Company, Syracuse, N. Y., was elected president of the National Electrical Manufacturers' Association at its second Annual Meeting at Hot Springs, Va., on June 13, succeeding Gerard Swope, president of the General Electric Company, who retains membership on the board of governors and on the executive committee of the association. The following vice-presidents to head the various divisions were also elected: Apparatus division, N. A. Wolcott, Packard Electric Company; appliance division, M. C. Morrow, Westinghouse Electric & Manufacturing Company; policies division, Clarence L. Collens, Reliance Electric & Engineering Company; radio division, Louis B. F. Raycroft, Electric Storage Battery Company; supply division, W. E. Sprackling, president Tubular Woven Fabric Company, Pawtucket, R. I.

For a term of three years the following were selected to become members of the board of governors: H. B. Crouse, Crouse-Hinds Company, Syracuse, N. Y.; R. Edwards, Edwards & Company, New York City; A. L. Eustice, Economy Fuse & Manufacturing Company, Chicago, Ill.; Otto H. Falk, Allis-Chalmers Manufacturing Company, Milwaukee, Wis.; W. L. Jacoby, Kellogg Switchboard & Supply Company, Chicago, Ill.; J. F. Kerlin, National Carbon Company, Cleveland, Ohio; D. H. Murphy, Wiremold Company, Hartford, Conn.; R. J. Russell, Century Electric Company, St. Louis, Mo.; Frank E. Wolcott, Frank E. Wolcott Manufacturing Company, Hartford, Conn. For a term of one year to fill an unexpired term, I. A. Bennett of the National Metal Molding Company, Pittsburgh, was elected.

Economy Fuse Buys Federal National

Economy Fuse & Manufacturing Company has recently purchased the Federal National renewable fuse department, including all material, physical property, patents and good will of the Federal National renewable fuse from the Federal Electric Company of Chicago.

Slight modifications in the original design of the fusible element have been made with the result that the National renewable cartridge fuse is now listed as standard, in all capacities up to 600 amp., in both 250 and 600 volts, in the April, 1928, List of Inspected Electrical Appliances, under the label service form of supervision by the Underwriters' Laboratories.

T. D. Halliwell, formerly with the Brooklyn Rapid Transit Company and later with the Westinghouse Electric & Manufacturing Company, is now with the Economy Fuse & Manufacturing Company, with the title of assistant to the president.

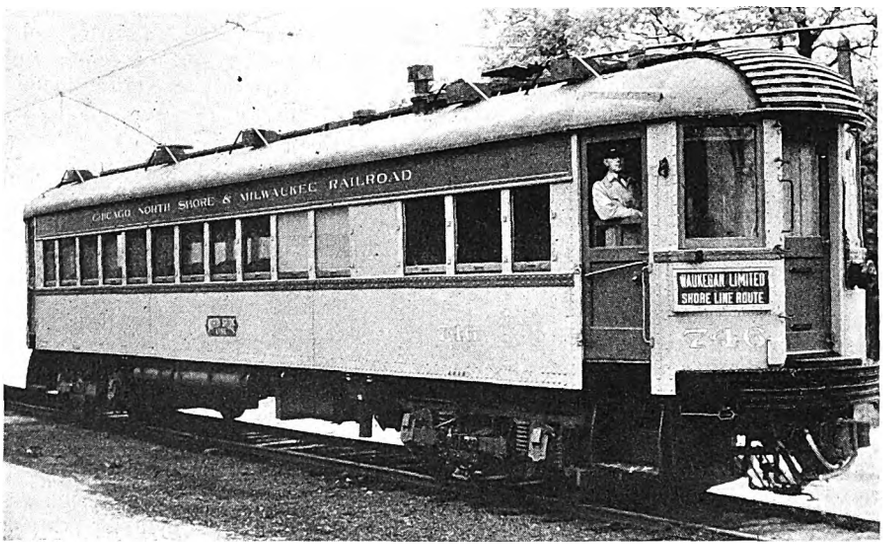
Conference Held on Handling Methods

A meeting of shippers, carriers, and warehousemen, held June 6, at the Department of Commerce, Washington, D. C., under the joint auspices of the Bureau of Foreign and Domestic Commerce and the Division of Simplified Practice, approved the proposed program covering simplified methods which

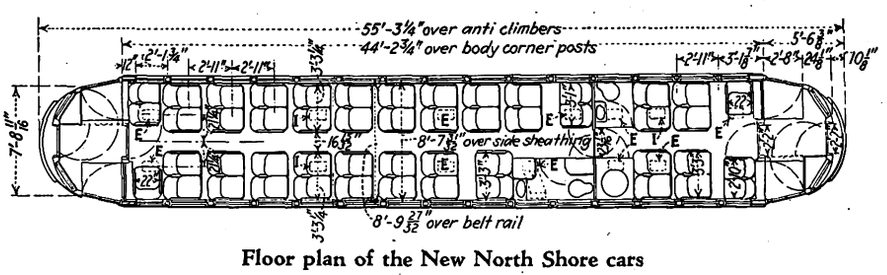
North Shore Cars Delivered

Fifteen interurban, two-man, motor, passenger cars have recently been delivered to the Chicago, North Shore & Milwaukee Railroad, Chicago, Ill., by the Pullman Car & Manufacturing Corporation, Chicago, Ill. The cars seat 50 passengers and are of the double-end double-truck type.

Each car weighs 105,000 lb., being 55 ft. 3¼ in. long and 9 ft. wide. They are of all-steel construction with arch roofs. One car is fitted with roller journal bearings. Each car is equipped with auxiliary battery lights for use when the power is off. Further details are given in the accompanying specifications.



One of fifteen interurban passenger cars built for the Chicago, North Shore & Milwaukee Railroad by the Pullman Car & Manufacturing Corporation



Floor plan of the New North Shore cars

Total weight	105,000 lb.
Bolster centers	32 ft. 8 in.
Length over all	55 ft. 3¼ in.
Length over body posts	44 ft. 2¾ in.
Truck wheelbase	7 ft.
Width over all	9 ft.
Height, rail to trolley base	12 ft. 6 in.
Window post spacing	35 in.
Body	All steel
Roof	Arch
Doors	End, swinging
Air brakes	Westinghouse AMU
Armature bearings	Plain
Axles	Heat-treated, 5x9-in.
Car signal system	Adams & Westlake No. 25 bell
Compressors	Westinghouse DH-25
Conduit	Metal
Control	Westinghouse HLF
Couplers	Ohio Brass, form 13
Curtain fixtures	Railway Curtain Co.
Curtain material	Pantasote
Destination signs	Hunter
Energy saving device	Economy meters
Finish	Duco
Floor covering	Linoleum and rubber tile
Gears and pinions	Nuttall B-P
Glass	Plate, ¼-in. in car body, ⅜-in. in front of motorman
Hand brakes	Peacock, Blackall handle
Heat insulating material	Salamander
Heaters	Peter Smith hot water, Railway Utility Company electric
Headlights	Portable arc
Headlining	-in. steel
Interior trim	Mahogany
Journal bearings	Fourteen plain, one Hyatt roller
Journal boxes	Symington
Lamp fixtures	Adams & Westlake center lamps
Motors	Four Westinghouse 557-R 5, inside hung
Painting scheme	Orange and maroon
Roof material	Wood, canvas covered
Sash fixtures	Adams & Westlake
Seats	Hale & Kilburn No. 900
Seat spacing	35 in.
Seating material	L. E. Chase Byzantine plush
Slack adjusters	Smith-Ward
Steps	Stationary
Step treads	Safkar
Trolley catchers	Knutson No. 5
Trolley base	US 20-C
Trolley shoes	Miller
Trucks	Baldwin
Ventilators	Railway Utility and Garland
Wheels	Rolled steel, 36 in. diameter
Wheelguards	Wood

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have been suggested for handling materials. The conference was called for the purpose of considering the use and extension through co-operative effort of simplified methods of handling, moving, loading and unloading goods; to promote the development of interchangeability in the equipment required for handling goods; and to promote the establishment of such dimensional standards as may be necessary to secure interchangeability of equipment.

Investigation of Unemployment Ordered

The Senate, just before adjournment, passed a bill requiring the committee on education and labor of the Senate, or a duly authorized sub-committee thereof, to make an investigation concerning the causes of unemployment and the relation to its relief through (1) the continuous collection and interpretation of adequate statistics of employment and unemployment; (2) the organization and extension of systems of public employment agencies, federal and state; (3) the establishment of systems of unemployment insurance or other unemployment reserve funds, federal, state or private; (4) the curtailing of production, consolidation, and economic reconstruction; (5) the planning of public works with regard to stabilization of employment; and (6) the feasibility of co-operation with the federal, state and private agencies with reference to the first three and last. The report of the committee is to be made to the Senate together with recommendations for legislation if such is deemed advisable, on or before Feb. 15, 1929.

Manganese Crossing Specifications Issued

Standard specifications for manganese crossings have been issued in booklet form by the Balkwill Manganese Crossing Company, Cleveland, Ohio. Aside from descriptive specifications of the crossings, recommendations are made for the particular type of crossings suitable for various uses, with full directions on how to specify.

Detailed drawings are given for angles from 90 deg to 60 deg. of a medium-duty type 40-bolt assembly; heavy-duty type 56, 64 and 72-bolt assemblies; extra-heavy-duty type 64 and 72-bolt assemblies; angles from 60 deg. to 50 deg. of heavy-duty type 56 and 64-bolt assemblies; angles from 50 deg. to 43 deg. of heavy-duty type 60 and 68-bolt assemblies and angles from 43 deg. to 35 deg. of heavy-duty type 62 and 70-bolt assemblies. Sectional drawings also show how modifications may be made to accommodate any kind of rail. Other plans show the 90 deg. and 65 deg. to 70 deg. heavy-duty type reclaimable crossings both assembled and disassembled, designs showing closure rails between crossings and suggestion for precast reinforced concrete foundation slabs.

METAL, COAL AND MATERIAL PRICES F. O. B. REFINERY

	June 19, 1928
Metals—New York	
Copper, electrolytic, cents per lb	14.5375
Copper wire, cents per lb	16.625
Lead, cents per lb	6.30
Zinc, cents per lb	6.5
Tin, Straits, cents per lb	46.75
Bituminous Coal, f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	4.175
Somerset mine run, f.o.b. mines, net tons	1.875
Pittsburgh mine run, Pittsburgh, net tons	1.8
Franklin, Ill., screenings, Chicago, net tons	2.15
Central, Ill., screenings, Chicago, net tons	1.55
Kansas screenings, Kansas City, net tons	2.35
Materials	
Rubber-covered wire, N. Y., No. 14, per 1,000 ft	5.3
Weatherproof wire base, N.Y., cents per lb.	17.125
Cement, Chicago net prices, without bags	2.05
Linseed oil (5-bbl. lots) N. Y., cents per lb.	10.8
White lead in oil (100-lb. keg), N. Y., cents per lb	13.75
Turpentine (bbl. lots), N. Y., per gal	$0.64

ROLLING STOCK

CHICAGO, SOUTH SHORE & SOUTH BEND RAILROAD, Michigan City, Ind., has been inquiring for ten motor cars with an option on five additional cars and five trailers.

CLEVELAND RAILWAY, Cleveland, Ohio, has purchased one urban type Twin Coach.

NORTHERN OHIO POWER & LIGHT COMPANY, Akron, Ohio, has purchased ten urban type and five parlor type Twin Coaches.

CINCINNATI STREET RAILWAY, Cincinnati Ohio has purchased eight urban type Twin Coaches.

COUNTY TRANSPORTATION COMPANY, a subsidiary of the New York, Westchester & Boston Railway Company, New York City, has accepted delivery of twelve Mack six-cylinder 29-passenger city type buses.

LORDSHIP RAILWAY, Bridgeport, Conn., has received a Mack four-cylinder chassis, 225-in. wheelbase coach.

BOSTON & MAINE RAILROAD, Boston, Mass., has accepted delivery of a Mack four-cylinder chassis, 230-in. wheelbase bus.

BOISE STREET CAR COMPANY, Boise, Idaho, has ordered two Mack four-cylinder 29-passenger city type buses.

WISCONSIN POWER & LIGHT COMPANY, Madison, Wis., placed an order for five 30-passenger A.C.F. street car coaches and later raised the order to a fleet of ten.

TRACK AND LINE

NOVA SCOTIA LIGHT & POWER COMPANY, Halifax, N. S., has been asked by the City Council to build a track extention on Quinpool Street.

COLUMBUS RAILWAY, POWER & LIGHT COMPANY, Columbus, Ohio, will start track reconstruction work about July 1, on the High Street Union Station Viaduct and East and West Goodale Streets.

MANHATTAN & QUEENS TRACTION CORPORATION, New York, N. Y., has received through the Borough of Queens, a bid from McElroy & Kerwin, 316 Flatbush Avenue, Brooklyn, N. Y., to relocate its tracks on Queens Boulevard, from 55th Road to Quinten Street, for $293,153. New track and poles will be required.

SPRINGFIELD STREET RAILWAY, Springfield, Mass., is installing new 6-in. 100-lb. T-rails on Hancock Street. As soon as the city completes its work on State Street the railway will start laying track. For this work 350 tons of new rail will be required.

BRITISH COLUMBIA ELECTRIC RAILWAY, Vancouver, British Columbia, relaying a portion of its street car tracks on Douglas Street, Victoria. The old 70-lb. high T-rail is being replaced with 87-lb. rail of a similar type. The work includes the renewal of the special layout at the intersection of Fort and Douglas Streets. Concrete header construction is again being used.

PACIFIC ELECTRIC RAILWAY, Los Angeles, Cal., has placed orders with the Union Switch & Signal Company covering the necessary materials for the installation of automatic block signaling on the Vineyard to Sherman Junction, Rivas to Glendora, and Los Nogales to Rio Vista sections of its lines. These materials include 42 color light signals, 76 relays, 82 impedance bonds, and 37 switch indicators.

SHOPS AND BUILDINGS

EVANSVILLE & OHIO VALLEY RAILWAY, Rockport, Ind., freight and office buildings were damaged to the extent of several thousand dollars by fire which started in adjoining buildings.

SASKATOON MUNICIPAL RAILWAY, Saskatoon, Saskatchewan, has applied to the local board for approval of expenditures of $20,000 on a carhouse extension.

GREAT NORTHERN RAILWAY, St. Paul, Minn., has awarded a contract to W. T. Butler, Seattle, Wash., for the construction of a shop at Wenatchee, Wash., for the repairing of electric locomotives.

CENTRAL ILLINOIS PUBLIC SERVICE COMPANY, Springfield, Ill., is planning an equipment storage and distributing plant to cost about $55,000.

BRITISH COLUMBIA ELECTRIC RAILWAY, Vancouver, B. C., has let a contract for the first 20,000-kw. turbo-generator for its Vancouver plant.

ADVERTISING LITERATURE

CRESCENT REFRACTORIES COMPANY, Curwensville, Pa., has issued series No. 1 of its technical bulletin service, containing the first twenty bulletins, including charts, formulas and simple rules for use by persons interested in refractory linings.

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Reversing Action a Factor In Brill Seat Success

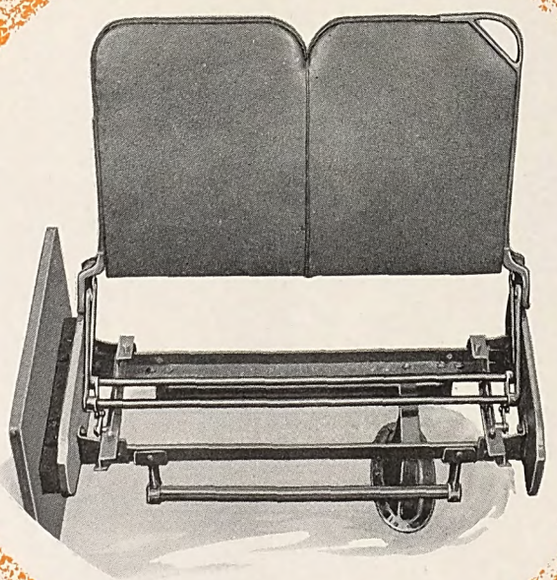
Much of the success of Brill Car Seats is due to the positiveness of their reversing mechanism. In the first place, the two seat rockers supporting the cushion are of rolled steel T-section. This type of rocker gives added strength and has a tendency to reduce wear to a minimum. These T-section rockers are held firmly in place and move to the reverse position only with the action of the aisle and wall arms to one of which, on each side, they are directly connected by a cam and link arrangement.

To this direct connection, as well as the simplicity and durability of the mechanism, the positiveness and efficiency of the reversing action of Brill Car Seats is attributed.

Specify Brill Seats—it pays.

THE J. G. BRILL COMPANY
PHILADELPHIA, PA.

AMERICAN CAR CO. ST. LOUIS MO. — G. C. KUHLMAN CAR CO. CLEVELAND, OHIO. — WASON MANF'G CO. SPRINGFIELD, MASS.



Brill Seats Build Transportation Sales

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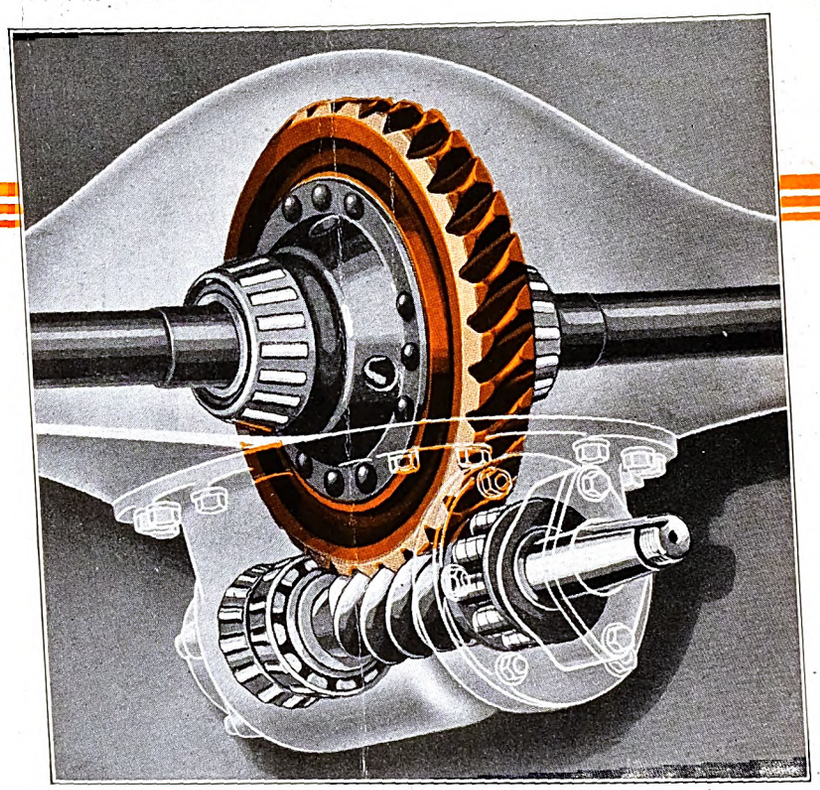

The ideal final drive-

To the patrons who ride in your motor coaches, Timken Worm Drive Axles mean strength, security, and the comfort of *silence.*

To you who operate motor coaches, Timken Worm Drive Axles mean long-life, dependability, easy accessibility, low operating costs.

THE TIMKEN-DETROIT AXLE CO., DETROIT, MICH.

TIMKEN AXLES

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ELECTRIC RAILWAY JOURNAL

raw-Hill Publishing Company, Inc. JUNE 30, 1928 Twenty Cents Per Copy

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for Salt Lake City—

All the advantages of modern trolley cars, yet with greater flexibility—elimination of costly track expense—and low maintenance through patented structure.

VERSARE

ELECTRIC COACH

[TRACKLESS TROLLEY]

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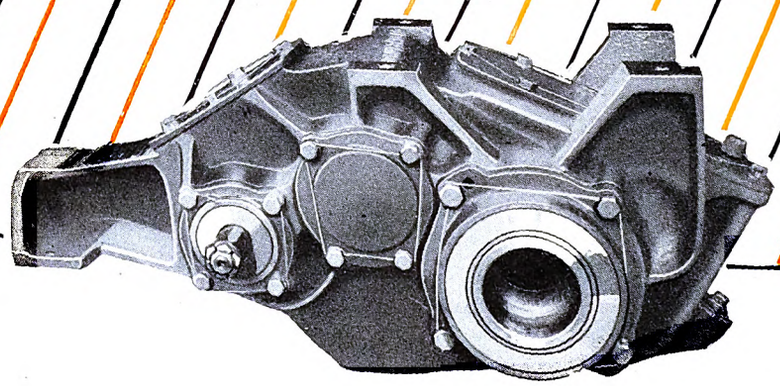
An electric car is no better than its gears!



The New W-N Drive

Just like the well-known chain and its weakest link, so are electric cars no stronger than their driving gears.

With this in mind, Nuttall engineers, in conjunction with Westinghouse, have designed the new W-N Drive, especially to withstand the wear and tear of electric traction use, and to make the gears as trouble-proof as possible.

To resist the constant wear of gear on pinion, heat treated hardened gears of helical design have been used. These are kept in alignment by an oil tight case of steel with Timken Roller bearings, and are immersed in a continuous bath of oil. This new improved gear drive permits the use of higher ratio of reduction and makes available the full efficiency of modern high-speed motors.

With this new drive cars can now be operated to maximum advantage and with least trouble, giving silent, swift and satisfactory service to the public, and giving the full benefits of that type of service through the profits that it brings.

All Nuttall Products are sold through the Westinghouse Electric & Mfg. Co., district offices: Refer your inquiries to the nearest Westinghouse Office.

Canadian Agents:
Lyman Tube & Supply Co., Montreal, Toronto and Vancouver

Westinghouse - Nuttall

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Electric Railway Journal

McGraw-Hill Publishing Co., Inc.
JAMES H. MCGRAW, *President*

Consolidation of
Street Railway Journal and
Electric Railway Review

LOUIS F. STOLL, *General Manager*
CHARLES GORDON, *Editor*

Volume 71 New York, Saturday, June 30, 1928 *Number 26*

Standing for True Business Statesmanship

EXTENSION of the McGraw-Hill publishing activities to every branch of American business is the most significant effect of the merger of the A. W. Shaw Company, of Chicago, and the McGraw-Hill Publishing Company, Inc., announced elsewhere in this issue.

Heretofore the magazine publishing activities of the McGraw-Hill organization have been confined to specialized service to major engineering industries and the trade channels for distributing their products. The book division of the organization, it is true, has long since broadened its scope; it publishes books not only on engineering, management and industrial subjects, but on general business and scientific agriculture.

Through the merger the McGraw-Hill institution now acquires a medium by which it can speak to the whole range of American business. *The Magazine of Business* has a circulation of more than 150,000 copies and deals with the problems fundamental to all business—such as those of finance, production, distribution and sales, management, transportation and export trade. It treats, as well, those major movements in legislation, such as taxation, tariff and government regulation, which bear upon business.

The importance of this new extension of the McGraw-Hill activities is apparent to all who have followed the standards which, under the leadership of James H. McGraw, have dominated its publications. To give, through effective organization, the best of which they are capable, is his constant admonition to the publishers and editors working under his direction. The new association of interests presages a virile development of an already effective service to the whole business structure of America.

Further, it is significant that in referring to *The Magazine of Business*, Mr. McGraw in his announcement of the merger closed with these words, "It will fight for the interests of business but it will place in an equally important position the responsibility of business to the public. It will, in a word, stand for true business statesmanship."

Past performance in McGraw-Hill papers is a warrant that this pledge will be fulfilled.

Attracting New Blood

"FOR long, long years he has labored to get his engineering degree," writes W. E. Wood, president Virginia Electric & Power Company, in the *Stone & Webster Journal*. Mr. Wood refers to the technical graduates of American universities, thousands of whom at this season step confidently from the class room and laboratory into the ranks of American industry. "Where shall he begin?" asks Mr. Wood. And then he gives the young man some timely and practical advice regarding those human factors in industry as important to success—if not more so—than is technical ability.

What of the part which industries themselves play in shaping the destiny of the young graduate? Choice of a position is the burning question in the young man's mind. Some electric railways have had notable success through placing young graduates in student training courses. As a rule, the plan of moving these men on into the operating departments when they have served their apprenticeship has not been worked out as completely as it should be. Other properties fail entirely to offer any inducement in the way of special training to the graduate.

Many large industrial corporations have recognized the need for organized effort to induct into their ranks the best of this annual crop of engineers who offer that youth and new blood without which any business quickly dries up. In attracting young technical graduates the industry is in competition with others that may seem to offer more to the young man. It has been in serious difficulty for many years, and still has many serious problems ahead. But in this situation lies the great opportunity for the graduate. He can be interested in the possibilities of the local transportation industry if the industry itself takes the initiative.

Enticing the Summer Traveler

JUST as banking houses have come to regard the small-salaried investor as desirable clientele, so of late years transportation experts and managers have been concentrating on tours, itineraries and rate schedules that will appeal to the modest wage-earner who each summer spends some portion of his savings on tours and trips. During this week the annual holiday trek gets under way, with millions of pleasure seekers bound for the beaches and mountains via boats, buses, trains and trolleys.

To induce as many of these prospective travelers to go by the railway's trolley, bus or tour, many companies have been offering special ticket and week-end rates. For instance, the Chicago, South Shore & South Bend has offered a three-day limit $2 excursion ticket to the Dunes on the shore of Lake Michigan with a glimpse of Chicago 30 miles away. Other companies, including the Philadelphia Rapid Transit Company, Kentucky Carriers, and the Public Service Co-ordinated Transport of New Jersey, have advertised special bus trips for excursionists and week-enders. One continued attraction for summer outings will be the Sunday $1 pass. The opportunities for education and recreation through this latter means of travel was told recently by a writer in the Los Angeles *Times* who, short of funds, was entertaining a friend from New York. They traveled on the Pacific Electric Railway on the $1 Sunday pass, and the recital of the places they saw and the territory covered read like a real adventure story. He said that if it weren't for the tourists, one might never discover the possibilities of one's own surroundings.

Railway managements, if they have not already done so, should take stock at once of the particular opportunities on their own lines to sell rides in the good old sum-

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mertime. Nature lovers, hikers, campers, bathing beauties —all are part of the caravan moving from the cities and towns on picnics, sightseeing parties and just-out-in-the-open revels. Cheaper rates and good accommodations will attract them. But railways must do more than just run vehicles. They must oblige their patrons with countless extra services. For example, tickets could be on sale at local stores and perhaps a guide might accompany a sightseeing trip. All such extra services will please the rider who has mapped out his time, and will encourage the vacationist who is uncertain where and how to go.

If transportation companies were only to do what was expected of them—carrying passengers hither and yon—they would transport only those business bound. The desired patronage that will round out the service is from the rider who wants to travel for pleasure, for rest or on educational pursuits. By and large, the public has developed a habit of travel. As a transportation and travel agency, the electric railway must consider the small tourist who in at least one season of the year is mentally and physically in tune with the world, is fairly amenable to suggestions and quick to react to bigger and better opportunities for becoming travel-wise.

Galvanized Buckets and the Man

MOST any man will do to fill a job, but to select a galvanized bucket—well, that requires considerable thought and careful inspection. With such comparison one of the flaws in electric railway management is brought to light by Dr. C. P. Segard, of the Third Avenue Railway, speaking at the recent meeting of the New York State Electric Railway Association. His complaint is that man power has been subordinated to mechanical power—that more attention has been given to equipment and operation than to the human element, which is indispensable no matter what type and kind of equipment are in use. He is at a loss to understand why, if the street railways pay out of their incomes approximately 50 per cent in wages, that in itself is not indication enough of the importance of man power in their business.

Mr. Segard's point is well taken. Some time ago before useful discoveries were made in the field of medicine, psychology and sociology, the man at work presented no special problem. He just came, was assigned a task and if he didn't measure up to the standard, assuming there was one, he was automatically dropped to become driftwood—a burden to himself and a liability to the community. Latter-day wisdom discovered many men inefficient in one branch of activity, with possibilities for fair success in another. Gradually time and effort were concentrated on studying the individual employee so as to know his endowments and proclivities. Then he was placed where he could employ his own particular talents to best advantage, become a contented worker and give to his particular industry something of himself that would make both him and the business grow.

Here and there railway managements have adopted this modern point of view. They have resorted to psychological tests, studied the research available, employed medical assistance and insisted on intensive training in their quest for employees physically and mentally qualified for specific jobs. There is a definite obligation on the part of business to cut down the number of misfits by a study of their employees' aptitudes and abilities. Progressive railway organizations are giving attention, as never before, to the importance of the human element in maintaining and selling a public service.

Many "Ifs" in the St. Louis Finding

JUSTICE in part finally has been done the St. Louis Public Service Company, successor to the United Railways, in the fare and valuation decision rendered by the Missouri Public Service Commission. In the matter of fares, the rates effective on July 1 have been fixed at 8 cents flat, with a 4-cent fare for children, contrasted with the present rate of 8 cents cash or two tokens for 15 cents for adults, and 3 cents for children. The new rate is substantially the request of the predecessor company made a year ago. In the matter of the valuation the figure fixed by the commission is $66,000,000. This contrasts with a sum of $75,000,000 set up by the company and the tentative figure of $52,000,000 fixed some time ago by the commission and apparently the sum on which calculations by the state body have heretofore been made. The valuation question has been a matter of controversy since before the receivership in the year 1919. To that subject alone eight pages are devoted in the final report of the receiver to the court, rendered only a few months ago as the concluding word of his stewardship.

During the almost nine years of the receivership, $1,500,000 a year was charged to depreciation reserves. This sum it was sought to continue as a yearly charge. The city contended that $1,000,000 a year was sufficient. The commission decided that $800,000 a year was enough. This is only 1.2 per cent on the valuation found by the commission. The justification for its ruling in this particular is found by the commission in the facts covering past expenditures, the present large reserves, and the good physical condition of the property at this time. This, of course, is a back-handed compliment, but it remains to be seen whether the sum now set up is sufficient to preserve that excellent condition. Under this plan the difference of $700,000 between the two sums becomes available, other things being equal, as net return, but other things may not remain equal.

It is the old two-edged sword again. The commission's estimate of the probable number of riders may or may not prove to be correct, but it is much to the company's credit that despite the decreasing number of riders carried the railway was able to keep its expenses at a constant during 1925, 1926 and 1927. Among the other interesting comments by the commission is that in its opinion stress should not be put on either original or reproduction costs of the property. The state body said that its desire was to give the company a return as nearly just as possible and still keep its customers.

This is a nice point, and one with which the company may find itself able to conform, but only because of the recent drastic reorganization as a result of which there are now outstanding only $46,457,458 of bonds and preferred stock. But there are a lot of "ifs" in the situation. If the commission's estimate of future earnings proves to be substantially correct; if its estimate of possible future passenger trends is correct; if its depreciation allowance proves to be all that is really needed to keep the property up to its present standard, and if the wage question now up for adjudication can be settled without imposing any additional or substantial burdens upon the company, matters may right themselves. These are only some of the uncertainties. So far as the new company is concerned it has been functioning only since Dec. 1, 1927, but in that time it has given ample evidence that it is keenly aware of its obligations to the public.

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Meeting the Need for Employee Training

MORE and more, transportation executives are realizing the need for intensive training of all employees who must perform tasks that require the exercise of individual skill or judgment. While this may be considered to include practically every person working for the property, those who are engaged in the operation of vehicles naturally need the most attention prior to assuming their regular duties on car or bus.

Closely coupled with this training is the selection of the men. It has been demonstrated on many properties that tests can be developed which will enable the examiner to determine with small chance for error whether an applicant has the mental acuteness and physical skill that work of this sort demands. After ascertaining in this manner that the applicant is fairly certain to become fitted for the task, the work of training can be planned accordingly.

This is what has been done by the personnel department of the Milwaukee Electric Railway & Light Company. Methods that are in use for the selection of men, which have been described previously in this paper, have been planned to weed out the unfit before, rather than after, the period of training. This has made it possible to concentrate on those applicants who have been accepted, with the knowledge that few of them will fail to qualify. In developing this idea further, a track and road have been constructed where the men are actually given instruction in their work on car or bus away from the main lines of traffic. An article in this issue tells of the equipment and methods in use. After such instruction the period of probation on the road can be shortened.

The important difference between this and the older methods of employment and instruction is that the entire plan is worked out as a whole, and the steps are arranged to fit into their places in a well-organized scheme. In this respect it constitutes a definite recognition of the returns which have been obtained from the earlier training work of the same company, which necessarily was carried along in abbreviated form but which was planned along the same lines as those now in use.

Creating Modern Standards

COMPETITION and change go hand in hand. An industry pressed to maintain its supremacy must take radical steps to keep pace. An outstanding example of this is the discontinuance of the Model T Ford automobile. The Ford Motor Company realized that the public was demanding more in the way of speed and appearance and, therefore, rearranged its entire plant to bring out a new model.

In most industries it is becoming more and more a survival of the fittest. As E. J. McIlraith stated it before the recent convention of the Canadian Electric Railway Association, "only the active, aggressive and progressive will survive."

While public transportation companies are being pressed relentlessly to make changes they must realize that it is necessary to create new standards along modern lines, rather than allow the development to become haphazard and disorganized. Accordingly there must be a readjustment in the thinking. True, many competent minds have been determining the ultimate development of the industry, but no general conception of its future has been seen by the industry. New ideas are being developed on many properties. It is the joint work of these contributors that eventually will raise the electric railway to the plane where it belongs.

Although much progress has been made in the several fields there still are numerous possibilities in every single one. In his paper Mr. McIlraith listed fourteen items "to serve as a foundation" in developing new ideas. Among these were traffic regulation and improvements of street use, reducing plain wastage in operations, building more comfortable and attractive cars, scheduling service suited to the various districts served, using properly the possible auxiliary equipment, active and effective supervision of the operations to insure performance of the standard sets, and planning for better and bigger city growth.

Each of the subjects named invites research. Not one has been developed to any degree of completion and all are fraught with possibilities. To these fourteen items might be added many others.

Readjustment and modernization in the electric railway industry and the development of new ideas is the answer to the question, "What can be done to create modern standards?"

Face to Face With Facts in Detroit

IN HIS report on the operations of the Detroit Municipal Railway, Ralph Stone appears to have settled the question of the future of the road in its effort to liquidate the cost of the system out of earnings. He says it cannot be done unless fares are advanced. That, of course, is a direction in which the system has been heading for some time. Another thing, Mr. Stone has made plain the reason for the so-called discrepancy of $1,000,000 between the figures of the system as presented by outside auditors and the returns made by the system's own auditor. The $1,000,000 is a tangible sum only in so far as it represents honest differences of opinion between two accounting schools. Mr. Stone has thrown the weight of his opinion in with the more conservative of the two declarations. In other words, he favors the Price, Waterhouse method as indicating conditions accurately. It is a nice point for the accounting technician to debate, the one that Mr. Hauser made to the effect that "it is impossible to pay for two plants at the same time, and that is in effect what is being done when depreciation and sinking funds are both established."

But Mr. Stone sees a legal point involved. He wants the Corporation Counsel to pass upon the matter of the interpretation of Section 14 of the City Charter. He even goes a bit further than was expected. His main finding was that unless the annual debt maturities can be met by rearrangement an increased fare will be needed to comply with the spirit of the city charter, if not the letter of that document. This he supplements with the statement that it is not possible to say that an adjustment of the existing rates of fare could be avoided by a rearrangement of the debt maturities.

Mr. Stone's is a carefully worded document, but for all that it reflects the impression long felt in quarters outside of official Detroit Department circles that an advance in fares is inescapable. The problem in all its details is too complicated for an analysis in a discussion of this kind, but the reports of operation from month to month have for some time pointed in the direction of an increase in fares. The political consequences of such a step would of course not rest lightly on those responsible for taking it, but it is to be hoped that the issue, if it is the real issue which Mr. Stone's report indicates, will be met on an economic rather than a political basis.

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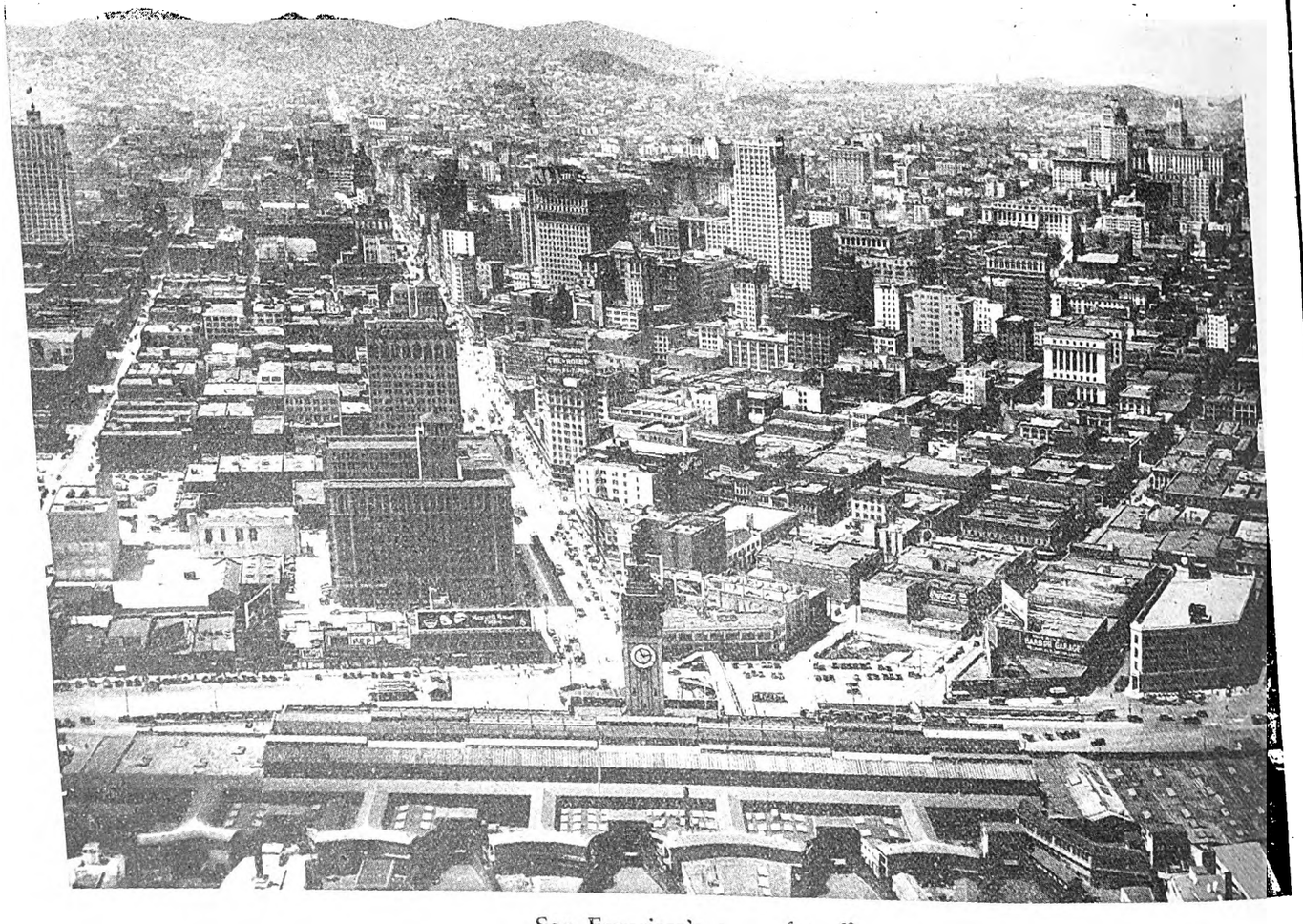
San Francisco Needs
Street Traffic Control

Extensive survey directed by Dr. Miller McClintock reveals street traffic problems caused by unusual physical layout of the city. Report condemns jitneys and makes suggestions on electric railway service

FIRST ARTICLE



San Francisco's area of traffic concentration

The large building in the foreground is the terminal for the ferries from the cities on the eastern side of the bay, like Oakland, Berkeley, etc. The broad highway leading from this terminal is Market Street, 120 ft. wide between property lines. In this part of Market Street there are four electric railway tracks, two belonging to the Municipal Railway and two to the Market Street Railway. This photograph is copyrighted by G. E. Russell, San Francisco.

SAN FRANCISCO, because of its topography and resulting unusual street layout, has developed many difficult problems. "In the hope of evolving constructive suggestions and thus bringing about improved street traffic control in San Francisco," Mayor James Rolph, Jr., appointed the San Francisco Traffic Survey Committee. This committee of 22 men from several companies, associations and clubs, organized an advisory council of 64, in which 21 associations were represented. Many business interests gave their financial support to the project and constructive co-operation was given by public officials and the press.

Dr. Miller McClintock, director of the Albert Russel Erskine Bureau for Street Traffic Research in Harvard University, was engaged to organize and conduct a comprehensive engineering survey. Theodore M. Matson was appointed chief engineer and the services of four others secured for the technical staff.

The conclusions in the report were formulated after a year of intensive investigation. Since the object of the study was to secure maximum fluidity of traffic by means of regulatory and minor physical improvements, and hence at a minimum cost, an exhaustive

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survey was made of the existing street facilities. Comprehensive and detailed recommendations for a system of street traffic control and proposals for administrative organization and methods to meet the problems of the future were based on the facts of street traffic conditions.

Much Traffic Data Collected

The survey was designed to include a study of the principal factors which affect the use of the street. An intensive check of traffic flow, volume, speed, concentration, and other important elements was first conducted to obtain correct conclusions as to the conditions which have led to congestion and accidents. The analysis of the collected data with respect to the economic wastes and accident hazards involved in street traffic, constituted the second step. With the foundation thus established, there followed a consideration of the ways and means of giving relief through regulation of street use and through minor physical improvements. Lastly, attention was given to the problems of city administration in connection with traffic matters, the formulation of a new and comprehensive traffic ordinance, and the requirements for a suitable and effective enforcement of traffic regulations through the functioning of public officials and police courts.

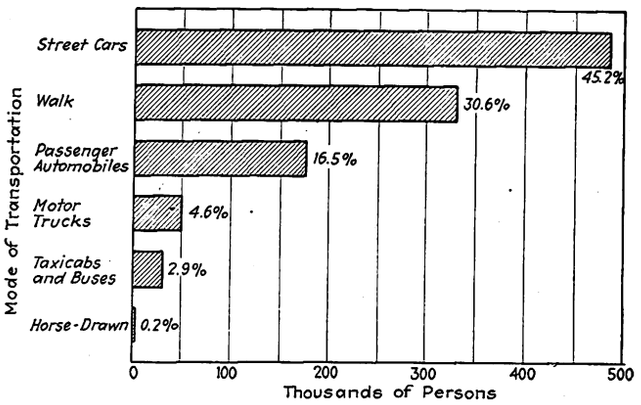
Attention was directed primarily to the area within the corporate limits of San Francisco. For the study two natural divisions were made in this area. First and most important was the central business district, along with the area immediately surrounding it. The second division included the remainder of the city, special attention being given to the prinicpal streets leading from the residential portion of the city to the central business district.

Recommendations Cover All Phases of Street Traffic Control

The report deals exclusively with the problems of traffic control, that is, the safest and most convenient utilization of existing street facilities to a more orderly movement of traffic. The recommendations made by the survey committee fall into several well-defined classes: first, installation and use of various safety and regulatory devices; second, enforcement of law through the police department; third, punishment of violators; fourth, administrative organization for a more systematic handling of future traffic problems; and fifth, a specific and balanced system of traffic regulations.

The report recommends that traffic direction signs be erected immediately to cover all the provisions for which signs are required in the proposed ordinance, that the enforcement of sections requiring signs be dependent upon their actual erection and that fuller use be made of paint markings for the indication of crosswalks, greater visibility of safety zones, and more accurate alignment of traffic.

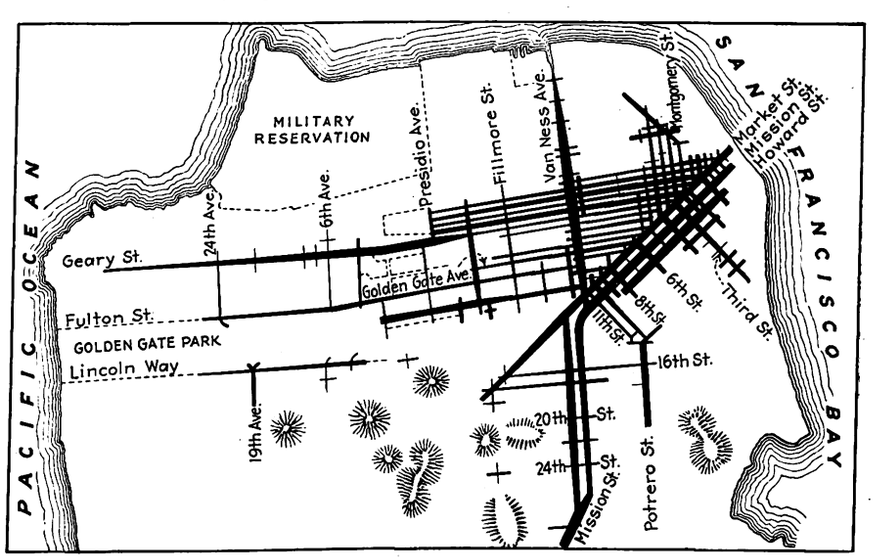
For the system of control designed for Market Street it recommends that three-light electric signals be utilized, also that this type of signal be substituted gradually for existing types for general control of traffic throughout the city; and the present type of signal eventually be utilized exclusively for pedestrian control requirements on Market Street. A complete program of traffic signal installations is proposed in the report and the order in which they should be installed is given.



Distribution by various means of transport of 1,073,963 persons entering and leaving the central business district of San Francisco on a typical week day in November, 1926

The report recommends that the personnel in the traffic division of the police department be increased in the near future to 125 officers. Inasmuch as special aptitude and training are required for effective traffic service, it also advises that the personnel for enlargement and replacement be drafted from young men who are applicants for the police department. A traffic school is proposed for the instruction of new men, the maintenance of high standards among the men already employed in the division, and for the general education of all police officers in the city in traffic control methods. Provision should be made, according to the report, for the investigation of all traffic accidents involving serious personal injury and for reports of all traffic accidents upon forms as recommended.

A more systematic enforcement of penalties against traffic violators through the establishment of a traffic fines bureau, is suggested as a substitute for the present method of citation for appearance at traffic police headquarters. Minor violators should be required to appear at the proposed traffic fines bureau, and pays penalties subject to a schedule of fines to be established by the judges of the police courts. Also, records should be



Relative vehicular traffic load on principal traffic arteries of San Francisco, based on an eight-hour count, from 8 a.m. to 12 noon, and from 2 p.m. to 6 p.m., September, October and November, 1926

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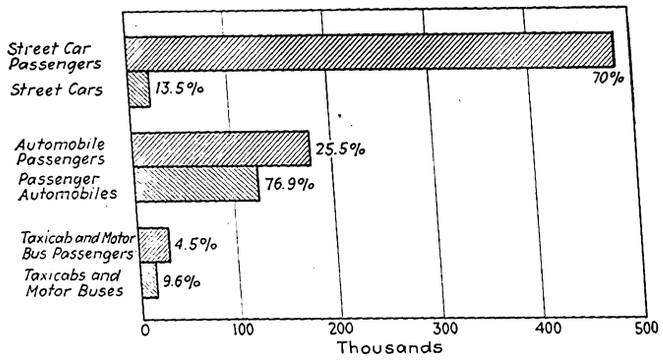


Distribution by various modes of street transportation of 693,384 passengers and 160,674 transportation units, entering and leaving the central business district between 6 a.m. and 8 p.m. on a typical week day in November, 1926

kept in order that persistent violators may be classified and properly penalized.

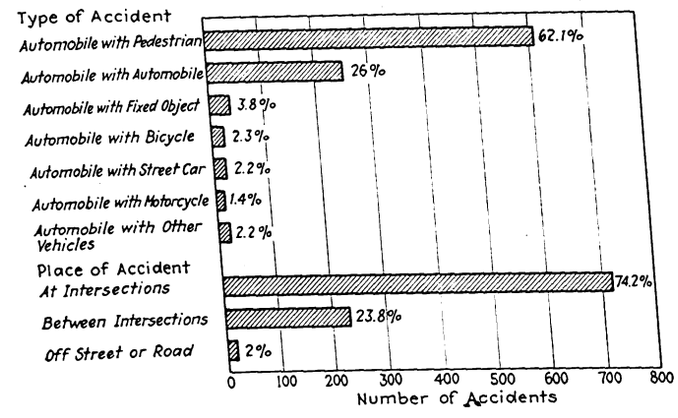
The survey recommends that a division of street traffic engineering be established in the bureau of engineering in the Department of Public Works, this division to consist of a traffic engineer and a technical staff. Its duties would be to study all traffic accidents and other conditions affecting the safe and orderly use of the public streets; to serve as the agency for application of the administrative provisions of the traffic ordinance, and to supervise the location, erection and maintenance of all physical control devices recommended in the report and required by the ordinance. The specific recommendations included in the report will be presented in the following paragraphs.

Cordon Count Shows Heavy Travel in Business District

Many detailed studies regarding volume, flow, and other general characteristics of the street traffic were made. On a typical day there was a total movement in eleven hours of 24,579 vehicles and 156,167 passengers. Ferry passengers make up 107,905 of the latter group.

A study of 183 intersections along the major routes of travel was made to determine the amount of traffic on and across the principal arteries. With the data obtained, a graphic chart was designed showing the relative vehicular traffic flow on the principal streets of the city. The concentration of traffic on certain routes is clearly revealed on the map.

To ascertain the degree of concentration of traffic within the downtown business district the survey undertook, through the co-operation of the two street railways, a cordon count of the central business district for a typical week-day. The study gives the amount of all types of traffic movement, whether inbound or outbound, and shows not only the number of each type of vehicle but also the number of persons and their modes of transportation.



Analysis of motor vehicle accidents involving personal injury in San Francisco for the months of November and December, 1926, and January, 1927

During the fourteen-hour period from 6 a.m. to 8 p.m. it was found that 744,667 passengers in all types of vehicles entered or left the central business district. Besides these were 329,296 pedestrians, making a total movement of 1,073,963 persons. The total number of vehicles was 203,641. Of the total of 1,073,963 persons, 45.2 per cent used street cars, 30.6 per cent walked, 16.5 per cent employed passenger autos, 4.6 per cent were on motor trucks, 2.9 per cent rode in taxicabs or buses and 0.2 per cent were in horse-drawn vehicles. Of the total of 203,641 vehicles, 60.7 per cent were passenger automobiles, 20.2 per cent trucks, 10.6 per cent street cars, 7.6 per cent taxis and buses and 0.9 per cent horse-drawn vehicles.

On the assumption that all who enter the central district leave it during the day, its average daily population is indicated to be 536,981 persons; that is to say, the equivalent of about 85.5 per cent of the population of the city proper passes through the central business district during each week-day, between the hours of 6 a.m. and 8 p.m.

In addition to the study of volume concentration of traffic in the central business district and vicinity, an analysis of the speed of flow was made. Observations were made by traversing each street in a motor car at different times of the day. The study reveals that the average speed of vehicles within the district studied is 10.13 m.p.h. It shows further that 12.3 per cent of the time required to traverse a street is lost by actual stops, and that the average running speed, that is, average speed attained while in motion, amounts to 11.55 m.p.h. The values are for street lengths and would be much lower if only for the central business district.

The physical condition of San Francisco complicates street traffic problems. Because the hills are steep and the areas reached by them not readily accessible, the growth of the city has been forced to concentrate into the lower and more level areas. This concentrates the traffic flow to fewer arteries of travel and reduces the available street area. The steep street grades are a serious accident menace. More than 35 per cent of the total street mileage of San Francisco is at grades exceeding 5 per cent. The lack of street area and the street design are other factors which have contributed to much traffic congestion within the city.

Street Cars Affected by Street Layout

The unique street layout of San Francisco, with a lack of arteries paralleling Market Street on the north side and the peculiar pattern by which all streets of the "western addition" branch from Market Street make acute and obtuse angles, has produced a great amount of street car congestion on Market Street. The concentration of street cars on Market Street is principally due to the inherent defects of the city plan. Yet, the duplication of service for the entire length of the street by the Municipal Railway and the Market Street Railway, and the excessive frequency of service resulting from the competition of these two systems have caused a large yearly loss to both railways. They have also materially restricted the growth of local merchandising in

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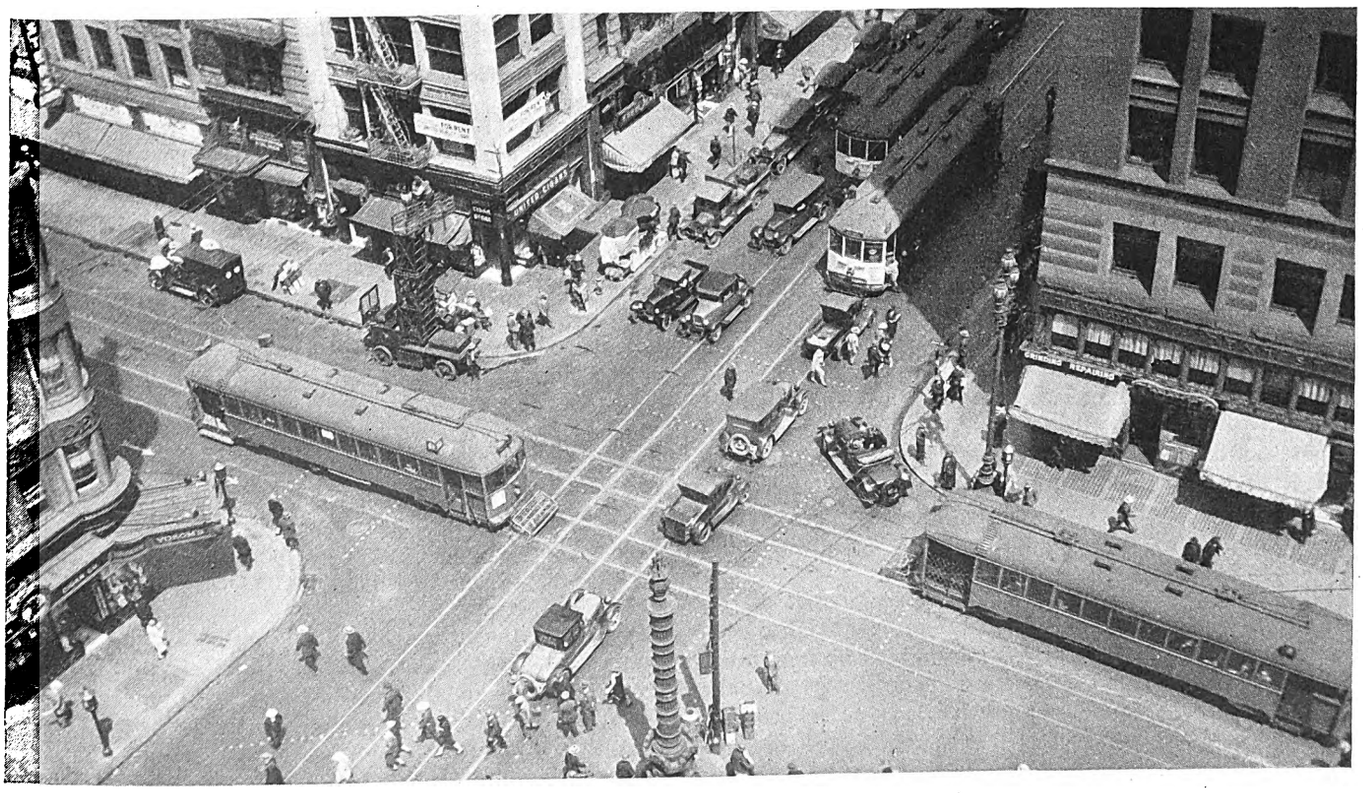
other business activities, because of the congested area and street hazards. Commenting on jitney service the report says:

"In addition to the excessive rail transportation facilities on Market Street, there is a duplication of service in jitney operation. Jitney service is absolutely unwarranted. They not only add to congestion by loading and unloading in the one traffic lane left for motor vehicles, but their practice is hazardous to their own patrons as well as to the patrons of the rail lines. Moreover, the jitneys operate only during the rush hours, taking the 'cream' of the business from the street railways which furnish the public with consistent, reliable service."

Street car movement was studied in conjunction with other vehicular traffic, so that a properly balanced system of regulation and control might be set up. While it was found that as a rule regulations which are really beneficial to motor vehicle traffic are equally helpful in expediting rail movement, certain intersections demanded special study and special regulation to improve the traffic stream as a whole. In arriving at the control measures outlined for several important intersections, certain car stops were eliminated because of their effect in preventing reasonable speed. A number of mid-block crossings were also eliminated because they delay many while accommodating only a few. As a rule, it was concluded that a reduction of one stop per mile results in an increase in speed of about 6 per cent.

The far-side stop on the north side of Market Street should be eliminated at all points, the report states. The obstruction caused to traffic flow by these stops is very serious. Other changes recommended in car-operating practice included abolition of the "dead-ending" of street cars from intersecting streets on Market Street and the standing of cars there to maintain a definite schedule. The schedule could be adjusted better at some other point on the line, if necessary. The report also says that left-hand turns of trolley cars into Market Street from such streets as Geary and Sutter Streets are the source of considerable delay in trolley speed on Market Street. Each movement of this character intercepts the flow of three lines of street cars and one line of vehicular traffic. Moreover, it prevents the smooth flow of traffic at the intersecting street running in a northerly direction. The situation, however, cannot be avoided under the present operating methods of rail movement.

This practice of reversing cars on a turntable on one of the side streets debouching into Market Street blocks traffic



Far side car stops on the north side of Market Street cause congestion, in the opinion of the authors of the report

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The ultimate solution of this difficulty can only result from a comprehensive plan of rerouting.

Many Accidents Occur at Intersections

An analysis of motor vehicle accidents in San Francisco involving personal injuries was compiled by the survey, with individual reports made by police officers for November and December, 1926, and January, 1927. The analysis shows that of 973 accidents, 62.1 per cent were caused by automobiles with pedestrians; 26 per cent automobiles with automobiles; 2.2 per cent automobiles with street cars; 3.8 per cent automobiles with fixed objects; and 5.9 per cent automobiles with vehicles other than those listed. A large majority of the accidents, 74.2 per cent of the total, occurred at intersections. Reckless driving or speeding was responsible for 56.8 per cent of the accidents on the part of the motorists. Jay-walking, crossing with no signal, running or walking into vehicles and automobiles running down passengers boarding or alighting from street cars were the chief causes of pedestrian accidents.

The analysis of accidents served as the basis for numerous recommendations. The report suggests that every effort be made to encourage the establishment of sound community habits in street use, that the simple traffic ordinance prepared by the survey be made the textbook for every motor vehicle driver in the city and that its provisions be made known to all who use the streets. To this end the survey recommends that at all times printed copies of the traffic ordinance be provided for free circulation through the police department, public schools, automobile organizations, business clubs, civic associations and all other organizations interested in traffic.

The survey further states that there should be an energetic and continuous educational campaign based upon the special traffic hazards as revealed by the future and constant analysis of accident records, and that the public officials should energetically pursue a program of protection for both motorists and pedestrians, through the construction and maintenance of the physical devices for traffic protection, direction and warning. These devices should include, among others, traffic signals, warning signs, paint marks, visibly marked safety zones and cross-walks, in accordance with the system as recommended.

The second article, to appear next week, discusses the pedestrian, parking and traffic control problems, and presents a proposed traffic ordinance.

Sunday Pass Plan Increases Riding

INSTALLATION of the Sunday pass by the Gary Railways, Gary, Ind., has been received by the public with great enthusiasm and has caused a large increase in riding and revenue, even though the plan has only been in effect since April 15. The increase in riding necessitated an increase in service on the Valparaiso division shortly after the pass was installed. The former two-hour service was replaced by hourly service, and later, on April 29, even this was inadequate and an extra car had to be added.

On the Saturday preceding the Sunday the pass went into effect, a cold rain fell all afternoon and evening, and Sunday was cold and windy, considerably dampening the company's hopes of a successful opening day. Despite the adverse conditions, 1,388 passes were sold and a total of 34,528 riders were carried for the day, an increase of almost 3,000 passengers over the average for the three previous Sundays.

On April 22, the second Sunday, the weather again was unfavorable, but 1,638 passes were sold, an increase of 250 over the first Sunday and an increase in passengers carried of nearly 3,300 over the average Sunday.

On the third Sunday, the weather was more favorable, and 1,989 were sold. This figure represented an increase of 351 over the previous Sunday and 601 over the first Sunday the passes were sold. There were 36,525 passengers carried on this day, an increase of nearly 5,000 over the average Sunday.

With the coming of more pleasant weather, the company is looking forward to a large increase in both riding and revenue as a result of the Sunday pass.

SAN FRANCISCO TRAFFIC SURVEY COMMITTEE

TRAFFIC SPEED STUDIES

STREET Mason
CONDITIONS FAIR-WARM.
OBSERVERS O'Donnell & Mohu

~LEGEND~
A - Automobile C.T. - Cross Traffic
A.S. - Arterial Stop S.C. - Street Car
C.C. - Cable Car T. - Truck
CON: Congestion T.S. - Traffic Signal
*(T.S.) - Officer

Cross Streets	Date	Cab No.	Time of Day	Time Reading	Time in Sec's.	Distance in Feet	Av. Speed M.P.H.	~Delays in Seconds~ A.	A.S.	C.C.	CON	C.T.	S.C.	T.	T.S.	Total Delay	Period Delay	Running Speed M.P.H.	Remarks	Double Parks	Backs to Curb
Clay to Pine																			Steep Hill		
Pine to Bush	10/4/26	94	4-5	00	37	343.75	6.30					04				04	10.00	7.00	Hill		
	10/8/26	302	1-2	5.55	33		7.08											7.08			
	10/11/26	302	2-3	00	33		7.08											7.08			
	10/13/26	374	12-1	2.42	2.3		10.15		02							02	9.70	11.12			
	10/15/26	374	3-4	3.52	20		6.34		03							03	10.70	9.33			
Bush to Sutter	10/4/26	94	4-5	37	35	343.75	6.66											6.66	Hill	1	
	10/8/26	302	1-2	5.22	31		7.52					06				06	19.35	9.33			
	10/11/26	302	2-3	33	31		7.52											7.52			
	10/13/26	374	12-1	2.19	25		9.33											9.33			
	10/15/26	374	3-4	3.24	20		6.34											6.96			
Sutter to Post	10/4/26	94	4-5	1.12	43	343.75	5.42					04			02	02	7.14	5.90	Hill	*2	*2
	10/8/26	302	1-2	4.51	163		1.43				20			66		04	9.30	5.90			
	10/11/26	302	2-3	1.04	127		1.84				90				*03	06	52.71	3.03			
	10/13/26	374	12-1	1.56	20		11.70									9.3	73.20	7.70			
																		11.70			

A portion of typical traffic speed study, as conducted by traffic survey committee

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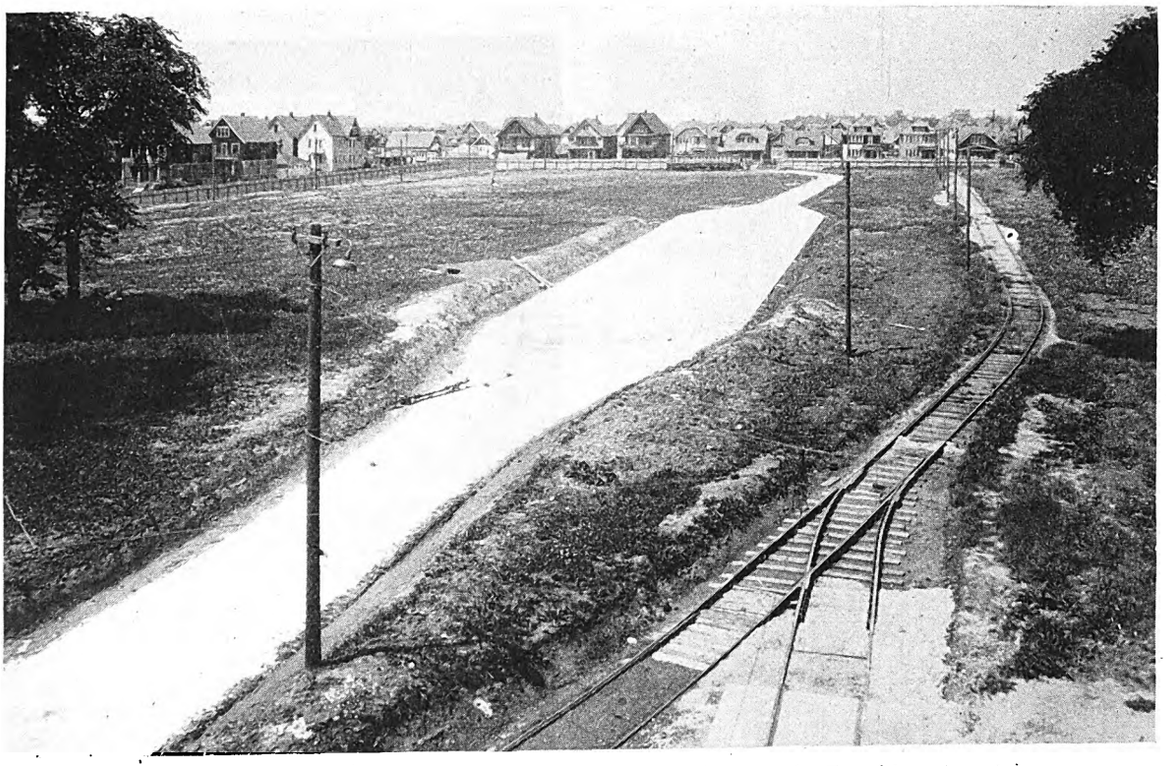

An oval practice track with stops, signals, switches and grades is used. Bus drivers practice on the macadam road shown in the center

Milwaukee Builds Practice Track and Road for Instruction

Half-mile car track, macadam bus road, and specially equipped building expand training facilities of T.M.E.R.& L. Company

FOR outdoor training of transportation employees a half-mile oval practice track and a tarvia macadam bus road have recently been constructed by the Milwaukee Electric Railway & Light Company. These, in conjunction with a transportation training building equipped with class rooms and an abundance of street railway, interurban and bus apparatus, enlarge materially the scope of the courses which can be offered the railway and bus men. The same building also has facilities to improve the organized trade training given to car repairmen.

During 1927 instruction was given to 114 conductors, 147 motormen and 370 one-man operators in the building and on the training track and bus road.

The housing of training facilities in a building designed especially for them makes it possible now to offer optional courses to the railway men in electrical equipment, air-brake equipment, car repairing, and special courses in English, arithmetic and other subjects. These all supplement the regular training given to prepare them for the job of conductor, motorman, one-man operator, bus operator or repairman. Supervisors, instructors and division superintendents, in addition to the rank and file of railway and bus personnel, are taking advantage of these opportunities for self-improvement.

The transportation training is given in a two-story brick building erected for the purpose adjacent to the Fond Du Lac station, the company's largest carhouse and storage yard. One class room on the second floor is especially equipped for the use of lantern slides, opaque projections and motion pictures. Special car equipment may be mounted for testing and demonstration work. A second class room is used largely for conductor training, and for the conductor part of one-man training. This class room has large bulletin boards where the schedules, transfers, accident and car condition reports, and other forms in use are posted. Instruction in the mechanical manipulation necessary for the conductor's job is afforded by an arrangement of sockets countersunk in the floor which permit setting up the forms of standard railing that inclose the conductor's position in the various types of Milwaukee street cars. The third class room is used for training motormen and one-man operators in the motorman's part of their duties. This room is equipped with a row of controllers for giving starting and notching practice. Another room is used for instruction of the rolling stock maintenance men. The fifth class room is devoted to training bus operators, both from the transportation department and from the Wisconsin Motor Bus Lines. For optional

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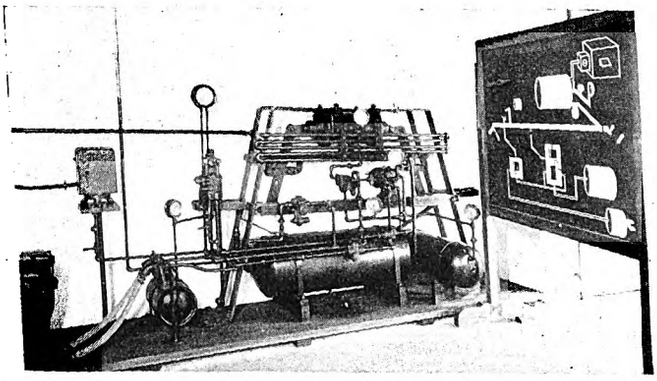
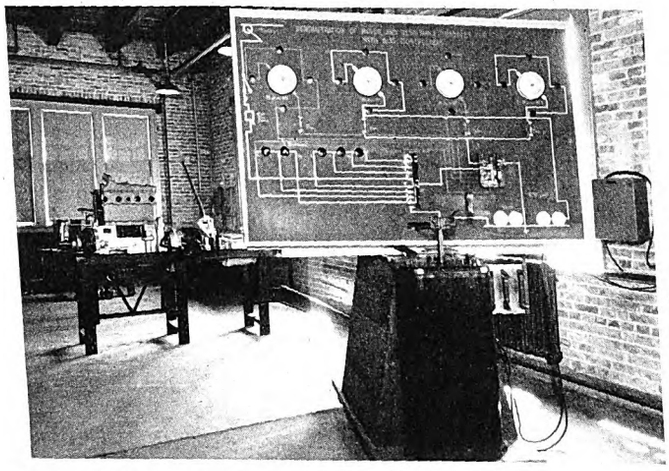


Set-up of interurban air brake equipment. The demonstration board at the right duplicates graphically the interlocking action of valves in air lines



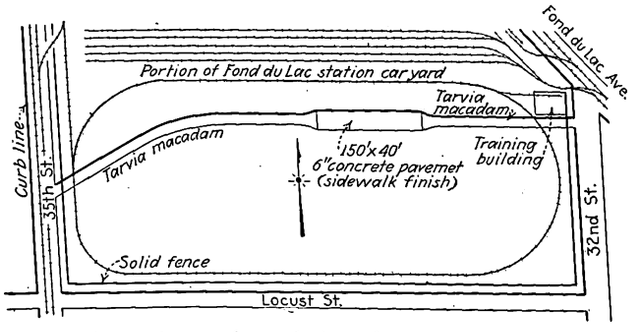
Several of these boards are used to show action of equipment and procedure in trouble hunting. In the background are cutaway demonstration bus motors, clutch and transmission mechanisms

work, any class room is used which is not in use at the time for some other purpose.

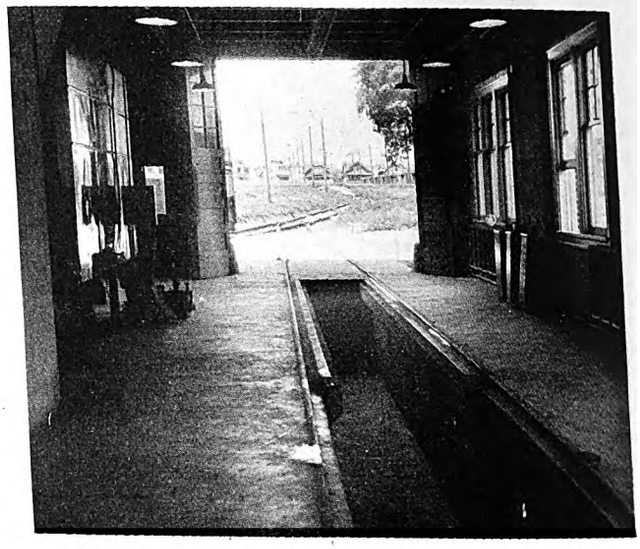
Besides the five class rooms, the top floor includes a storeroom, an interview or examination room, a private office and a general office. The general office is not only a space for instructor's work, but has complete records of the men trained, material for the several courses, etc.

The ground floor of the building is given up entirely to apparatus, to be used for laboratory instruction. On it there is installed a variety of railway equipment arranged to show the operating principles of the cars on the road.

Bus equipment includes a White poppet-valve motor, with cut away sections for illustrating motor principles,



The oval practice track, exclusive of spurs to the neighboring Fond Du Lac car yard and into the training building, is 1,997 ft. long. The bus road runs from end to end, vehicles completing their circuit through streets along the training field



This 60-ft. track pit is so constructed that either a street car or a bus can be run over it

next to which is mounted a Knight sleeve-valve motor, coupled with clutch and transmission, all having sections cut away to permit study of the mechanism.

Along one wall the air-brake equipment found on the rapid transit cars is mounted so that all of the troubles which happen out on the road may be demonstrated. Details of this arrangement of air-brake equipment are shown in an accompanying illustration. Near this equipment is a demonstration blackboard which shows by means of a schematic diagram the operating principles of interurban air brakes. Another piece of equipment is a double demonstration panel having a K-35 controller on one side and a K-6 controller on the other. These boards demonstrate graphically the principles of operation of the electrical equipment of most of the types of cars used in Milwaukee. Another board shows the hook-up of electrical equipment on the rapid transit cars, and another one the operation of the air brakes on all one-man cars.

A work bench, near a window, is used in the training of maintenance or repair men in details of soldering, chiseling and other bench work. In the center of the room is a shortened electric car, on which all of the equipment of a modern safety car is to be mounted, exposed to full view, for study by both the repairmen and trainmen. A well-lighted track pit extends the full length of the north side of the building and is connected by a concreted spur outside to the training track. This pit is built so that both street cars and buses may be driven over it. The indoor section of track is used in the training of maintenance men and car repairmen in the main uses of the various parts of the car truck. A complete truck with gears exposed assists in this instruction.

Training Track Carefully Detailed

The outdoor training track is more than ½ mile in circumference, and completely incloses a plot of ground two blocks long and nearly a block wide. Five street cars can be run around this track with sufficient headway to allow for the instruction of the platform men in all phases of their work. Regular stops bearing street designations are distributed around the track, and the student is taught to stop at standard places and call streets in a standard way. The track is so located that these regular stops are made on level ground and on

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grades. On each trip around the track, the student operator must open and close an electric switch, pass through a set of Nachod signals and run under a trolley circuit breaker. The spur between the training track and the training building is concreted. On this 75-ft. stretch of track, a car is derailed as part of the training practice. Every new man must learn how to use the car rerailer.

Illumination for night practice is supplied by twelve 200-watt lamps equipped with white enamel reflectors and mounted at equal intervals on the trolley poles which parallel the track.

The track has two grades, a short one of approximately 4 per cent and a longer grade of 6 per cent. As part of the operator's training he has to make emergency stops on the steeper grade after the track has been greased to simulate conditions during inclement weather.

A training road for bus instruction is partially completed. The road bisects the training track inclosure, extending the full length of the field with access to streets at opposite ends of the training ground. The road is being designed to give bus operators special training in backing and turning around, double clutching, avoiding skidding, and in maneuvers which cannot be carried out on a public street without interference to traffic. A section of this road consists of a 40-ft. pavement 150 ft. long, with a 5 per cent grade, the section being heavily cemented.

This two story brick building, housing the offices, classrooms, and special training equipment, was opened last October

The instruction is tied in with the operating department through the supervisor of training, who reports both to the superintendent of transportation and to the educational director. There is no direct connection with the medical department, although all men must have a doctor's certificate before they can start training. Special men are given examinations at the request of the training division. During 1927 the approximate average cost of training per man trained was $100. This included instructors' salaries and students' pay while in training.

The importance of learning to do things in a standard way is the first subject handled in the training course. One standard way of operating a car to get good results is taught, and the motormen are told that this is the only method to use, even though they will probably find older men on the system using different methods. The next classroom subject is the controller. Practice on notching to stop on every notch, to use proper feeding speed, and to respond quickly to signals is given. Controller troubles are discussed and their repair demonstrated. The air brake is next discussed with classroom practice on operating the air valve. The rest of the first day is spent on the outdoor track, practicing the proper notching of the controller and the use of air brakes on a regular street car. The functioning of Nachod signals is demonstrated on the track and also by means of parallel switching circuits located within the laboratory at a point where, through a window overlooking the track, the action of the signals can be observed.

Effort is made to get the man thoroughly familiar with the department organization, the duties of supervisors, instructors, clerks and division superintendents. A great deal of time is spent in discussing the rules of the road. Safety is strongly emphasized. The necessity of constant attention to changing conditions of street traffic is thoroughly impressed on the railway man's mind. Various dangerous situations are discussed in the hope that the new man will recognize when danger impends without needing the actual experience of an accident.

Under the supervision of an instructor each new motorman spends three days on the practice track, putting into effect the principles which have been demonstrated in the class room. About three hours of these first three days are spent in teaching the man the location of all parts of the car with which he must become familiar.

One of the first things the conductor is taught is the use of standard practice in handling his job. This is not only true in the mechanical methods of doing his work but in the method of announcing streets and in the use of standard expressions. The mechanics of making change, selling tickets, and handling transfers are explained. Signals are taught, with emphasis on safety as well as in connection with helping the motorman to speed up the schedule. One-man operators are given a combination of motorman and conductor training courses. Platform instructors are trainmen who have regular runs but are specially trained. When they have a student for road instruction they are given a day-off run so that practice may be had on all runs.

And Now—

An Experimental, American-Type Car in Europe

For details, see next week's issue

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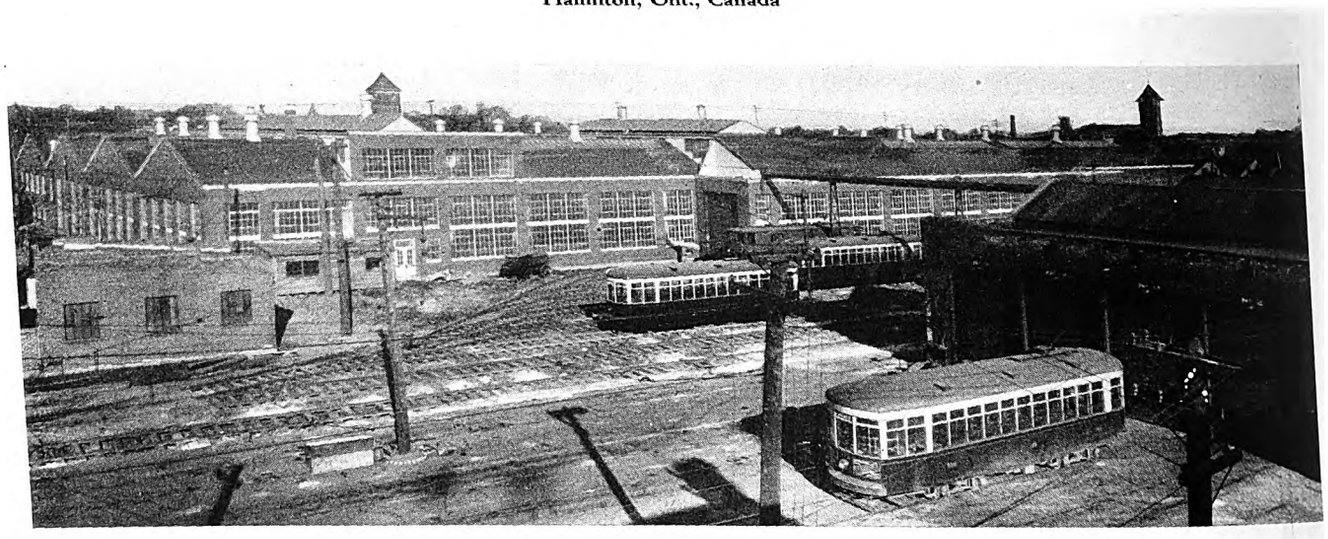
Car Shop and Garage Is of Latest Design

Building erected by Hamilton Street Railway provides excellent working conditions for employees and allows maximum efficiency in performance of maintenance duties

By C. J. Porter
Construction Engineer Hamilton Street Railway
Hamilton, Ont., Canada



The size of the new building can be seen in this view, which also shows the old inspection barn and a section of the storage yard. Note the many windows in the walls of the new building

FOR some time the old car shop and inspection barn, on account of unfavorable location, lack of room and dearth of modern equipment, failed to afford adequate facilities for the maintenance and repair work of the rolling stock of the Hamilton Street Railway, Hamilton, Ont., Canada, and the interurban railway owned by the Dominion Power & Transmission Company, the parent company. The inauguration of bus service made the situation more acute because the company owned no building of suitable design or location to serve as a bus garage. The foregoing considerations in conjunction with the agreement with the city of Hamilton, made at the time a new franchise more favorable to the company was secured, resulted in the decision to undertake the construction of a modern car shop and bus garage.

Excavation work began for the building on Aug. 20, 1927. On March 1, 1928, a few days more than six months later, the new building was occupied and operating in large part. In addition to the building, the construction program included five new storage tracks and a sixth track to enter the car shop.

The building is a one-story, fireproof structure, covers an area of 85,600 sq.ft., or 1.96 acres, and has a total floor area of 109,921 sq.ft. It includes four main sections, the offices and headquarters for employees, a general storeroom, a bus garage and a car shop. In designing the building and selecting the equipment, care was taken to provide for the comfort and efficiency of employees. Adequate heating facilities, good lighting and ventilation, sanitary conditions of the best and machines to do the heavy work were factors not overlooked. The plan also included adequate means of efficiently handling materials and equipment, and of routing work through the various departments.

Building Located Advantageously

Careful consideration was given the location of the new building. The requirements were that it should be as central as possible with respect to the various street car and bus routes to eliminate dead mileage of rolling stock to and from route starting points, that if possible it should be located on property already owned by the company, that it should be so connected with the existing storage yard and street railway system that it would afford maximum facility for movement of cars, and that it should require the minimum modification of existing storage yard trackage. The requirements were all met by locating the building as shown on the accompanying drawing. Certain properties were acquired and consolidated with the plot already owned by the company. Buses have access to two streets, Wentworth and Nightingale, while track connections are made on two other streets, Wilson and King. The tracks on Wilson Street, in turn, provide connection over track on Sanford Avenue to the belt lines at Barton and King Streets, and

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View of the pit room and the craneway. At the left of the crane are the armature repair and machine shops, and to the rear of these shops is the general storeroom

with the Hamilton Radial Electric Railway at the corner of Sanford Avenue and Wilson Street. The storage yard connections with the belt line on King Street remain as before.

The building is 385 ft. 6 in. long, and 250 ft. wide at the widest part, narrowing to 157 ft. at the smallest width. Its total floor area of 109,921 sq.ft. is divided as indicated in Table I. The four main sections are the offices, completely equipped for the car shop superintendent, the general construction superintendent and their staffs, and quarters including locker rooms and toilets for the shop and construction employees; a general storeroom where all shop and construction materials for the Dominion Power & Transmission Company in Hamilton are stored; a bus garage where all city and interurban buses and service trucks will be repaired, serviced, cleaned and stored, and the car shops where city and interurban cars will be repaired or rebuilt. The car shop section includes a machine shop, armature repair shop, forge shop, pit room, paint shop, carpenter shop and a transfer table which serves the four latter subdivisions.

All foundations are of concrete, reinforced with steel where necessary. All exterior walls are faced with pressed brick laid in dark mortar. The building trim along Wentworth Street is of cut stone, while that of the remainder is of artificial stone. The inside face of the exterior wall and all interior walls are of high-grade building brick, painted. An outstanding feature of the exterior walls is that 40.5 per cent of their entire area is for windows. The windows are of factory ribbed glass, set in ventilated steel sash. All inside walls with the exception of those in the offices are painted white with a dado of pearl gray 4 ft. from the floor. The partition walls of the offices are of gypsum slab construction, plastered and painted in a buff shade and trimmed in chestnut. The building's interior has a very bright and pleasant appearance.

The floors in the bus garage, inspection and repair pits, paint shop, basement and employees' quarters are of concrete treated with a hardener. The floors of the general storeroom, machine shop, armature repair shop, pit room and carpenter shop are of creosoted wood blocks, laid grain on end on a concrete slab to which the blocks are bonded by paving tar. The wood block floors resist wear, are easily cleaned and do not become slippery and hazardous for the workmen. The forge shop floor and the transfer table runway are of cinder fill on earth. The rails for the transfer table, however, are laid in a substantial concrete bed.

The building's main supports are steel columns of H section, while the roof is carried on trusses of structural steel. Close to 550 tons of structural steel were required for the entire building. The roof is of reinforced gypsum slab, laid on steel purlins and covered with three layers of roofing laid in hot tar. The great number of skylights in the roof is another feature of the building. With a total area of 10,720 sq.ft., they permit a wealth of light to enter. They are of ribbed wired glass fitted into and held by formed members of solid copper sheet. All flashing and entrance heads to downspouts are also of solid copper.

Unit heaters with motor-driven fans are placed in suitable locations throughout the building. Steam for the heaters is furnished through a main from a central heating plant, consisting of two 200-hp., Kewanee-type boilers and located in the inspection barn. A coal pit was constructed under a track just outside of the boiler room. Coal in carload lots is brought in bottom dumping cars and emptied into the pit, from where it is transported by wheelbarrow into the boiler room.

Power and lighting are supplied through transformers located in a vault under the employees' washroom. All wiring is in metal conduit with the exception of feeder mains strung open through the trusses. Switch panels for the many lighting circuits are provided at convenient points. Lighting units consist of 110-volt lamps mounted

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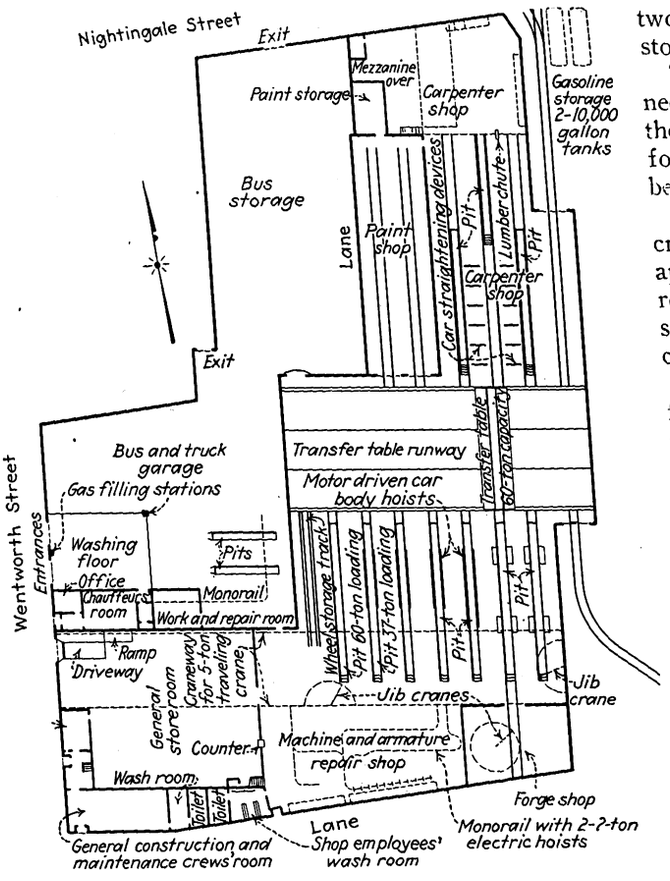

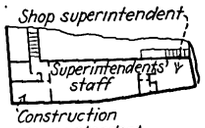

Plan of Mezzanine Floor

The many units of the building are arranged to provide the utmost in efficiency in handling cars, buses and materials

in standard dome reflectors. The intensities of illumination provided for the various departments are listed in Table II.

Offices Are Spacious

The offices are located on a mezzanine floor above the employees' quarters. The shop superintendent has an office at one end of the suite with a window overlooking the shop, while the construction superintendent has an office at the opposite end. The large intervening office, which has an area of 900 sq.ft., is for the staffs of the two departments. On the main floor is an office for the stock clerk in charge of the storeroom.

The offices and storeroom were made larger than necessary for the car shops alone, so that the staffs of the Dominion Power & Transmission Company caring for rolling stock, track work and line construction could be concentrated at one point.

Quarters for shop employees and general construction crews are commodious and comfortable, with well-appointed locker and wash rooms, toilets and an assembly room. These are located underneath the offices in the section of the building facing Wentworth Street. They can be entered from the shop or from the outside.

The storeroom, with an area of 8,410 sq.ft., is used for materials for both the car shop and the line construction work. A 5-ton, motor-operated, overhead crane serves 4,000 sq.ft. of its floor area. The crane is used to unload incoming materials and equipment entering by trucks through the Wentworth Street entrance, or by carload over the transfer table and a track in the pit room. The crane also covers 6,000 sq.ft. in the machine shop, serving lathes, wheel presses, heavy drills and other machinery. That portion of the storeroom not served by the crane is occupied by steel shelving of latest design, in which a myriad of materials are stored.

Transfer Table Is Important Unit

The transfer table, capable of carrying a load of 60 tons, is one of the most important units in the entire shop. It operates between the ends of the machine shop tracks at one end of the building and those of the paint and carpenter shops at the other end. It also serves the bus garage through a door at the end of the runway.

The machine and armature repair shops including the pit room occupy an area of 28,070 sq.ft. The machine shop proper is equipped with every type of machine needed for efficient work. The machines doing heavy work are located in the craneway, so that heavy pieces may be lifted to and from them with the crane. Machines doing work of a lighter nature are placed in the remaining section of the shop. Materials for this section are handled by an overhead monorail system with two electric hoists of 2-ton capacity. Jib cranes with hoists are provided also at convenient locations. Lists of the more important items of equipment for the machine shop and armature shop are given in Tables III and IV.

In the pit room there are seven tracks with pits and an eighth for storage of wheels. All repair pits are open, allowing easy access from one to another, and providing room to lay aside tools or parts removed from trucks. The rail heads are 4 ft. 10 in. above the pit floor, giving good head room for working on car trucks. Lighting units are placed in the sides of all pits and project light upward.

Two repair pits are equipped with wheel pits with removable sections of rail. Three pits have motor-driven car hoists, each capable of raising the entire body of the heaviest car from its trucks.

The heating and drainage facilities of the pit are of particular interest. Three unit heaters are located below the main floor slab. The warm air, driven along the pit by the heater fan, in rising from the pit, comes in contact with the undergear of cars and is extremely effective in the removal of ice and snow in winter. Good drainage of pit floors has been effected by crowning them a little and placing drainage openings between them. This insures good drainage of the floor for the workmen and ease of cleaning.

TABLE I—FLOOR AREAS OF THE BUILDING'S SEVERAL SECTIONS

Section	Sq.Ft.
Carpenter shop, including repair pits, main floor, basement and mezzanine	17,520
Paint shop and storeroom	4,410
Transfer runway	11,550
Machine shop, including repair pits	28,070
Storeroom	8,410
Garage, including repair pits	36,026
Offices	3,935
Total floor area	109,921

TABLE II—INTENSITIES OF ILLUMINATION FOR THE VARIOUS DEPARTMENTS

Department	Foot Candles
Storeroom	12
Machine shop	10
Forge shop	12
Carpenter shop	12
Paint shop	6
Bus garage	14
Garage workroom	12
Offices	

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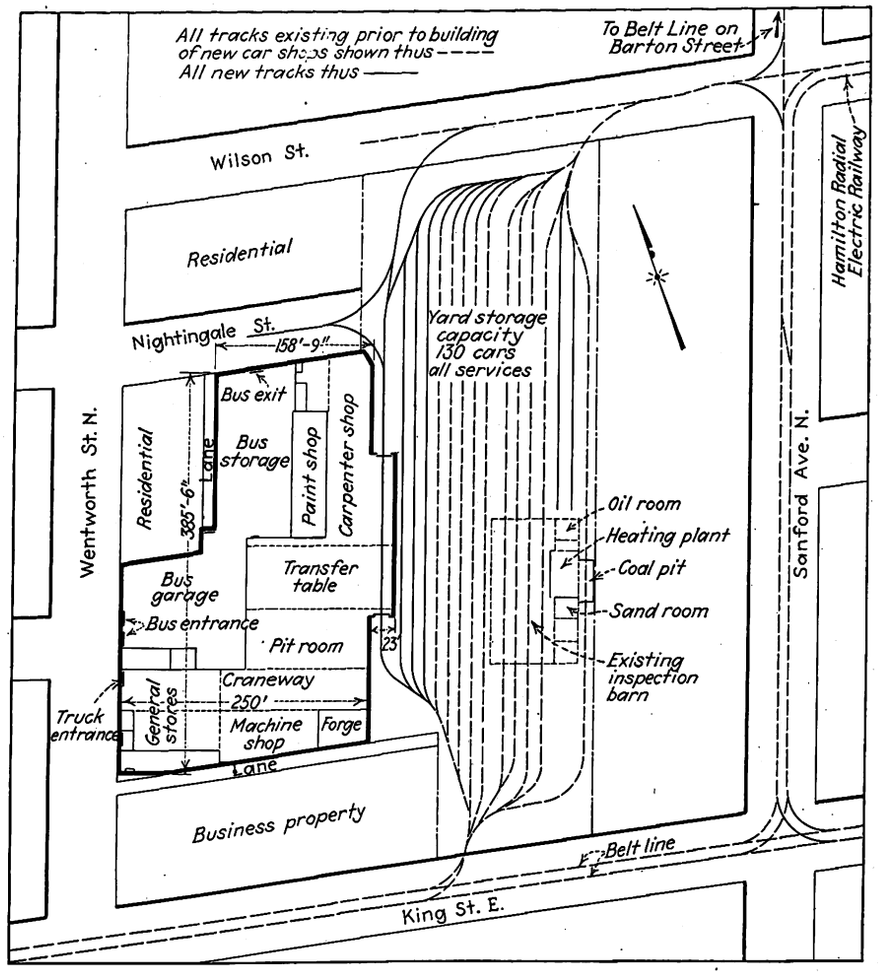
The forge shop, in one of the corners of the building, is convenient to both the machine shop and the pit room. Car trucks may be rolled into the shop for repairs on an extension of one of the pit tracks. A jib crane operating through 360 deg. and equipped with a 2-ton electric hoist handles heavy parts in the shop. An exhaust fan creates a draft over the forge fires and carries away all fumes and smoke. In Table V the equipment of the forge shop is listed.

Body rebuilding and repair work for cars and buses is done in a large, well-equipped carpenter shop. Three tracks, each with a pit, accommodate six cars of any length now in use on the system. Each pit extends the full length of the longest car, allowing minor work to be done to the underbodies. A car-straightener made of structural steel buttresses which hinge into slots in the floor is a useful device of this equipment. Cars that are bowed or twisted are readily brought back into line with these buttresses, beams and jacks. The principal pieces of equipment in the carpenter shop are listed in Table VI.

The millroom section of the carpenter shop is adjacent to the section in which the tracks are located. Below the shop floor is a basement with a floor area of 2,050 sq.ft., providing ample and convenient storage. A lumber chute and stairway communicate with this basement. Upholstering work is performed on a mezzanine floor which extends over a section of the carpenter shop and paint storage room, as shown at the bottom of the plan on page 1070.

Between the carpenter shop and the bus garage is the paint shop, with a floor area of 4,410 sq.ft. It has two tracks which will accommodate four of the longest cars. The shop has excellent lighting and ventilation. It is provided with an exhaust system to change the air frequently and remove paint and varnish particles suspended in the air when spray equipment is used. Tubular posts with arms which may be moved vertically on the posts support platforms for the workmen.



General plan of the present terminal showing the convenient location of the new building with respect to the storage yard and the adjacent streets. The new tracks are shown by solid lines

Garage Designed for Efficiency in Caring for Buses

In addition to ample office and work room, the bus garage with its floor area of 36,026 sq.ft. has space for storing 45 buses and trucks. Two doors on the Wentworth Street side are for entrance, while a door at the extreme end of the garage, and another to a lane adjacent to the west side of the building, provide exits to Nightingale Street. The garage was designed for rapid and efficient care of the buses. Wash racks and a specially drained wash floor are just inside the entrance door, so that buses can be cleaned just as they are brought in from their various routes. Warm water to temper the cold water and to assist in the removal of ice and snow in winter is supplied from a 2,000-gal. storage tank. After being washed the buses are serviced with gasoline, oil and grease, as required, and the tires are tested and inflated at convenient air hose connections. If any repairs or adjustments of a major nature are required a bus is

TABLE III—MACHINE SHOP EQUIPMENT, IN PART

One heavy-duty wheel lathe with 18-ft. bed.	One shaper.
One heavy-duty general purpose lathe.	One bolt machine.
One intermediate lathe.	One power-driven hacksaw.
One small lathe.	One cylinder grinder for air compressor and automobile engine cylinders.
One large drill.	Three motor-driven car hoists.
One intermediate drill.	One horizontal wheel press.
Two small drills.	One cleaning and rinsing tank.

TABLE IV—ARMATURE REPAIR SHOP EQUIPMENT, IN PART

One commutator slotting device.	One coil taping machine.
One commutator turning lathe.	Two coil winding machines.
One 30-ton vertical forcing press.	One armature baking oven.
One armature banding machine.	

TABLE V—FORGE SHOP EQUIPMENT

One jib crane with 2-ton electric hoist.	Four forges with down draft.
One 600-lb. air-operated power hammer.	One combination punch and shear.
	One babbitt melting gas furnace.

TABLE VI—CARPENTER SHOP EQUIPMENT, IN PART

One circular saw.	One Radial-arm sander.
One planer.	One disk sander.
One jointer.	One wood-turning lathe.
One lightning cut-off saw.	One mortiser.
One table saw.	One tenoning machine.
One band saw.	

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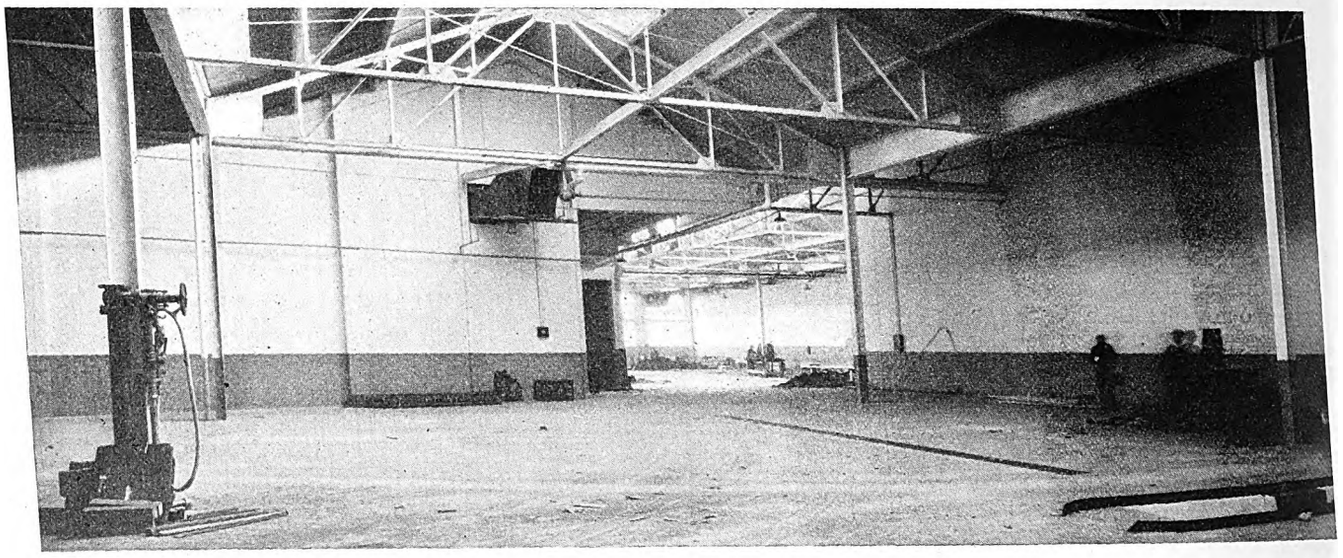


View of the bus garage looking toward the storage end. At the left of the doorway may be seen the ventilation hood and above the hood, the steel roof truss construction. Buses are serviced and repaired in the rear section of the garage

driven over one of the two repair pits. After servicing, the buses are placed in a storage section of the garage.

Gasoline is stored in two 10,000-gal. underground tanks remote from the building, and is forced through underground pipe to the filling stations, two of which are located at the Wentworth Street entrance. Water pressure obtained by a small water tank located in the peak of the carpenter shop forces the gasoline through the pipe. Nozzle valves of the filling station are opened by pressing a trigger and permit a flow of 20 gal. per minute.

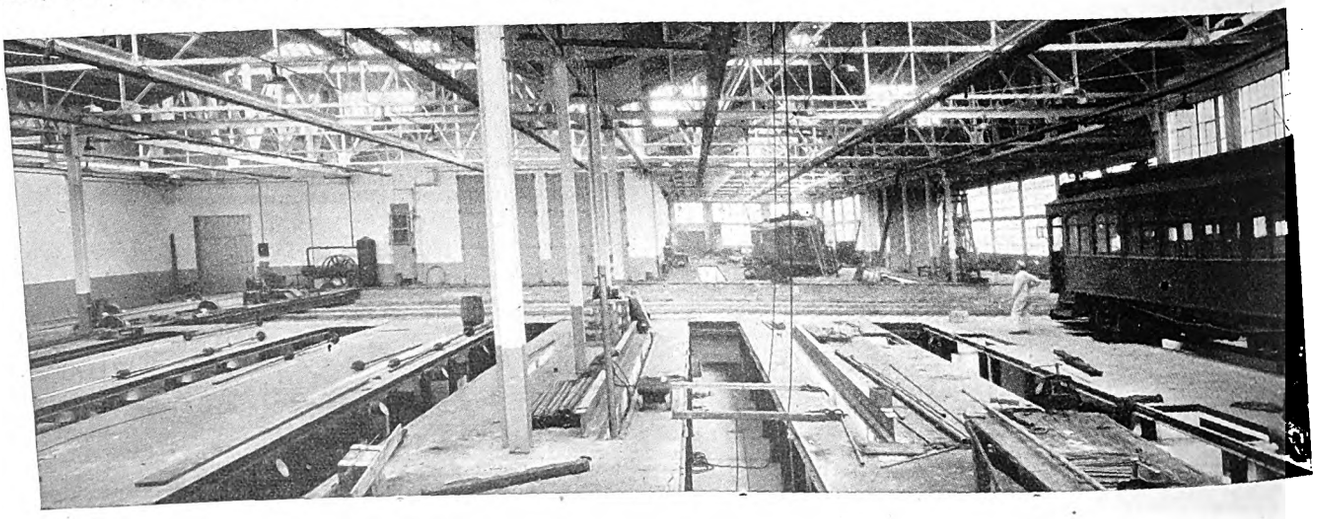
The unit heaters of the bus garage are so arranged that they may recirculate the air of the room or draw fresh air from outdoors. When drawing fresh air from outdoors a slight air pressure is created in the garage which effectively expels the fumes.

Inspection Barn Used for Car Washing and Minor Repairs

The car inspection barn, built some years ago, is to be used for greasing, oiling, renewal of brakeshoes and the detection of faults. The minor repairs will be made here, while others, such as the replacement of a damaged motor, imperfect wheels, etc., will be made in the new shop. Car washing is done also in the old building, where ample track space is available and where proper washing racks are being installed for the purpose. Each car in service is washed once a week.

Track additions include two storage tracks extending half the length of the yard, three extending practically its full length and one passing through the new building to serve the transfer table. A separate track was laid from the one extending through the building to join the Wilson Street track, and a wye was constructed in Nightingale Street. Two single-track curves were made at the corner of Wilson Street and Sanford Avenue, and a double-track curve at the corner of King Street and Sanford Avenue.

The general layout of the building and the arrangement of equipment were planned by the engineering department of the Dominion Power & Transmission Company of Hamilton, while the design and working out of building construction details were done by the firm of B. H. & F. Prack, architects and engineers. Most of the construction work was done by local contractors and the company's own construction forces.



Another view of the pit room, looking toward the carpenter shop and the two closed doors of the paint shop. The transfer table can be seen at the left of its runway

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South American Cities Have Fine Railway Service

Lines are heavily patronized and prove profitable. Considerable pleasure riding is done in some of the cities near the equator

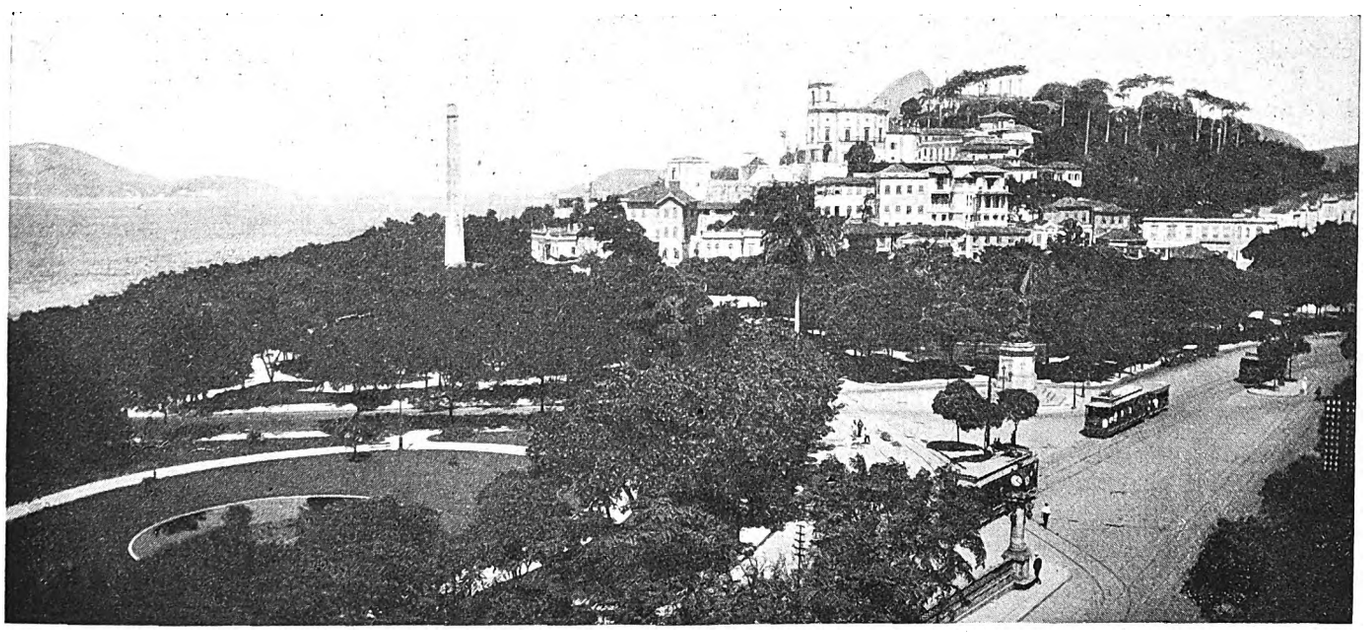
By Arthur Floyd
Victoria, B. C., Canada

ELECTRIC railways in the various cities of the South American republics are uniformly good. Starting with the largest city of South America, Buenos Aires, the wonderful capital of Argentina, we find electric traction well established, with frequent services to all parts of the city and suburbs. Zone fares obtain in all the Latin-American cities, as in many cities in Europe. The lowest fare is the equivalent of 2 cents.

An Anglo-American company operates the service. Most of the cars are of the English type, as the American car would be too long for the narrow streets.

Turning to the west coast, we find Valparaiso, foremost seaport in Chile, a city with a topography strikingly similar to San Francisco, with steep hills in all parts of the town. Many of the cars here are of the double-deck type, as used in Great Britain. The seats inside are for first-class passengers and the outside for those paying for second-class seats. Many amusing scenes are witnessed with American and English visitors, who invariably seek the outside seats, both for the fresher air and the possibility of seeing the town to better advantage. The natives stare at the Anglo-Saxons, well dressed and seemingly prosperous, sitting outside with the hoi-polloi, not knowing that their fellow passengers paid the higher fare and preferred to sit on top to view the sights.

A picturesque feature on the Valparaiso electric railways is the woman conductor, who wears a rather jaunty



Open cars are the rule in Rio de Janeiro, owing to the tropical climate

British and German companies share the franchises to run cars in Buenos Aires. The cars are of European design and of rather small size.

In addition to the surface lines, a British company has built an excellent subway system. The cars on this line are modern and of an approved type. A feature is the embellishment of the stations, the names being strikingly prominent in mosaic lettering. The trains emerge from the subway about 3 miles from the city and continue on the surface to the more distant terminals. The Argentine Central Railway also is electrically equipped for suburban service for a distance of 30 miles. The third rail system is used. This line is well patronized.

Montevideo, the charming capital of the Republic of Uruguay, can also lay claim to a fine electric railway system. This city, one of the most Spanish of all the Latin-American towns, has a large amount of track. In spite of extremely narrow streets, the cars render service to every part of the city. They seem almost to touch the houses in passing around corners. The lines which run to Pocitos and Ramirez, two fasionable seaside resorts a few miles from Montevideo, do an enormous business.

hat not unlike a waterproof derby. These Amazons perform their work expertly and climb up and down the winding staircases of the cars with facility. How they manage when encountering belligerent males is hard to say, although it must be admitted that when the Chilean goes on the warpath he is one boisterous *hombre*. Perhaps the native Chilean gallantry asserts itself in such case and no harm is done.

São Paulo, Brazil, one of the amazingly modern and prosperous cities of South America's largest republic, possesses an excellent traction system, in common with the other places mentioned. This city, with a population of well over 400,000, is the great coffee center of the rich province of Minas Geraes. The tracks radiate from one of the central plazas to all parts of the city.

There are many beautiful trips to be had in São Paulo, not the least interesting being the ride out to the famous snake farm at Busançon. This snake farm is maintained by the Brazilian Government for the purpose of studying at close range the various poisonous snakes with which interior Brazil abounds. The cars are modern and neatly finished in cream and black and are of the European type. Traffic is exceedingly profitable, if one

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Rio and Sao Paulo, two large and beautiful cities in Brazil, possess excellent tramway systems. A plaza in Rio intersected by car lines. is shown at the right. The Sao Paulo view shows the Automobile Club in the background

can judge by the full loads carried at all times of the day.

All of the cars in this city, even the small ones, carry both motorman and conductor. Indeed, the writer never once came across a one-man car in the whole of the South American continent. Evidently there is not the stress of competition down there that there is in North America. One reason probably is in the fact that few mechanics there can afford to own an automobile. The joy rides of the masses are taken on the street cars.

Last, but not least, we come to the beautiful city of Rio de Janeiro, by many considered the world's most scenically grand city. Here is the finest street car service in the southern hemisphere. There is a regular electric railway terminus on the Avenida Central, in the heart of the city, from which point the system radiates to all parts of the city and distant suburbs.

In no city in the world are there so many scenic trips to be enjoyed as in Rio de Janeiro. The cars skirt the wonderful harbor, world famous for its beauty, and reach out to the lovely seaside resorts that abound near the city. A particularly charming ride takes the visitor along the Beira Mar, a crescent-shaped drive along the coast. This road is likened to the famous Corniche Road in the south of France, in the Riviera district. Another wonderful journey by electric car is to the little suburb of Santa Theresa, over canyons and crossing a fine old bridge built in the time of Dom Pedro, last emperor of Brazil.

The management of the car company in Rio makes special provision for tourists, and this class of travel proves highly profitable. One trip of note is to the Corcavado, a high prominence overlooking the sea, with an elevation of nearly 3,000 ft. The trip is through luxurious tropical foliage, with wonderful vistas on all sides. At the top of the Corcavado there is a public restaurant and beer garden, where visitors can refresh themselves before returning to the city.

The cars in Rio are well maintained and have center entrances. Owing to the tropical latitude of Rio there is no necessity for windows in the cars, and here lies one of the chief magnets for drawing customers. It is the regular thing on the part of the Rio populace to take trips around the town and along the sea front to escape the humid atmosphere, which at times is quite oppressive. A ride in an open car on one of the magnificent avenues of Rio on a hot night is a real joy, and in affording this relief to the citizens the street car company is a benefactor to the city. A Canadian corporation controls the destinies of the Rio de Janeiro Electric Railway, which is a profitable concern.

Altogether South America can be proud of its electric traction systems, and it can be noted there is not the competition that similar systems have to contend with in North America. In fact, extensions are being made quite generally, but especially in Brazil.

The Readers' Forum

More on Car Heating Costs

CHICAGO SURFACE LINES
CHICAGO, ILL., June 21, 1928.

To the Editor:

The discrepancies between the conclusions reached in my recent letter to you on Mr. Baumgarten's article regarding "Heating Costs" and his reply to him seem to arise from a difference in interpretation and viewpoint. To attempt to reconcile the various points of difference would result merely in an extended controversy.

The point which I wished to emphasize, and which Mr. Baumgarten also brings out in his reply, is that each installation must be considered on its own merits, and the savings realized will be determined by conditions peculiar to the application. We realize that very different conditions obtain on a large property from those encountered on a smaller one, such as the required capacity and distribution of substations, and the corresponding distribution of peaks which tends to reduce the power plant demand or required capacity, resulting in a much better load factor.

We feel sure, however, of our figures and deductions presented as applying to our property and conditions. Our calculations have taken into account demand charges such as we obtain, and include only such other items as seem properly chargeable to the particular type of heating considered, but do not include those which should be common to all forms of heating. In like manner, the savings take into consideration the availability of heat when needed, and loss when generated though not required.

W. C. WHEELER,
Engineer of Equipment.

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Maintenance Methods and Devices

Fireproof Lacquer Spray Room

By J. W. Weir

Assistant to General Superintendent of Maintenance Kansas City Public Service Company, Kansas City, Mo.

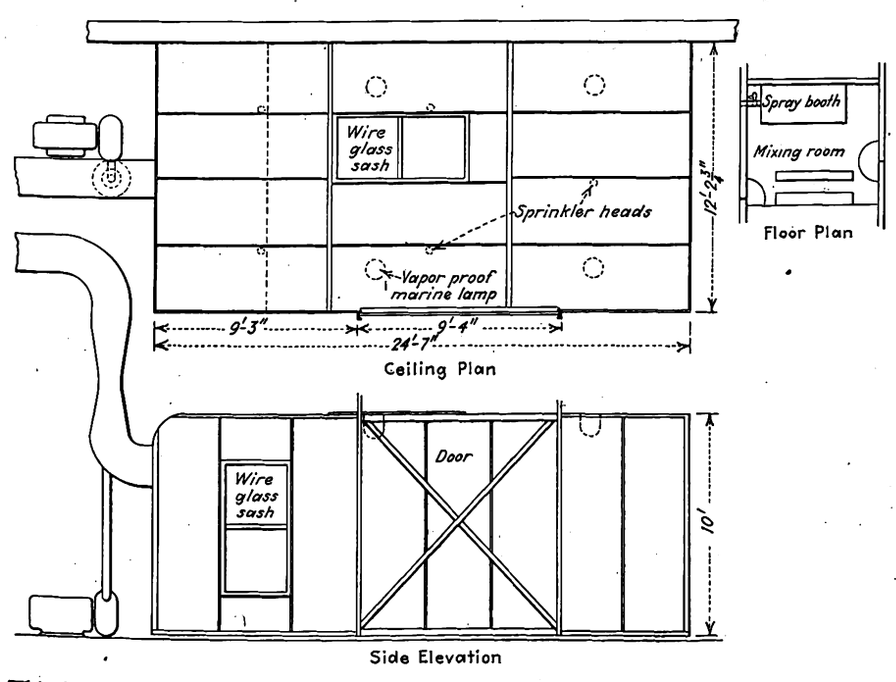
USE OF sprayed lacquer as a maintenance item in the 10th and Lister shops of the Kansas City Public Service Company has increased rapidly in recent years. A part of the overhaul program for cars of this company calls for lacquering of numerous car parts such as window guards, seat cushions, seat frames, stanchions, window frames, etc.

In order to handle this class of work without incurring a fire or explosion hazard and in conformity with the requirements of the State Inspection Bureau, the spray painting equipment has been isolated from the remainder of the paint shop.

The accompanying diagram gives a general idea of the arrangement of the lacquer spray booth. It is located in the paint mixing room and is constructed entirely of sheet steel reinforced with angles. The sash is metal with two-wire glass. The booth is ventilated by an indirect type of blower fan and air ducts which will completely change the air in the booth every two minutes. The room will be illuminated with marine type vapor-proof lamps.

Access to the booth is through a large fire door constructed under the specifications of a class A fire door, which was made large enough to permit the hauling of material into the booth on electric-driven industrial trucks.

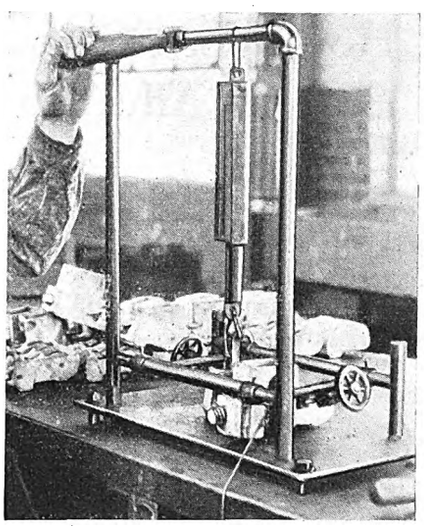
Fire protection will consist of three open sprinkler heads of the wet type, two mounted within the booth and one in the exhaust air duct. There will be five sprinkler heads on the same system in the mixing room.



This lacquer spray booth in the paint shops of the Kansas City Public Service Company is of fireproof construction and contains latest equipment for handling this type of work

Brush-Holder Tension Measuring Device

FOLLOWING an overhaul in the electrical department of the Coney Island shops of the Brooklyn-Manhattan Transit Lines, it is the practice to adjust and measure the brush-holder spring tension in order to insure uniformity and accuracy. For this work a device has been developed. The brush-holder is clamped in position, a spring clip attached to the brush pressure lever and the pressure read on a spring balance as the tension is raised by a lever arm. A link connects the clip attached to the brush pressure arm to the spring balance, and the top of the balance is fastened to the inside end of the lever, as shown in the illustration.



Testing brush-holder spring tension by a special device in the shops of the Brooklyn-Manhattan Transit Lines

The apparatus is mounted as a unit on a plate 20x12x¼ in. This is fastened firmly to the work bench, the plate being raised slightly from the bench by bushings. The framework for clamping the brush-holder in position and supporting the spring balance is constructed of ¾-in. pipe in the form of a rectangle. The front and rear longitudinal pipes carry straps to which are riveted rectangular pieces that support the clamping mechanism. The straps on the front and rear pipes slide for adjustment, but when in position to fit a particular type of brush-holder they are held firmly by cotter pins.

Each of the two longitudinal cross-members carries a nut for the hand screws used in clamping the brush-holders. These nuts are also arranged to slide back and forth to provide proper adjustment. The screws are provided with a small hand wheel at the top and a swivel end at the bottom which rests on the brush-holder frame. The adjustable clamping device thus provided will clamp different types of brush-holders securely in position in a moment's time.

The two upright pipes at the front carry a crossarm on which is mounted a lever on a sliding sleeve to support the spring balance. The front end of the lever has a wooden handle

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while the back end has a link to hold the spring balance.

The lower end of the spring balance is fitted with a ring and a spring clip so as to attach quickly to the brush-holder lever arm. After attaching it to the brush-holder arm the operator pulls down on the front end of the lever which raises the spring balance and the brush-holder lever arm. The tension can then be read on the spring balance.

How Worn Carbons or Brush-holder Boxes Affect the Neutral Position

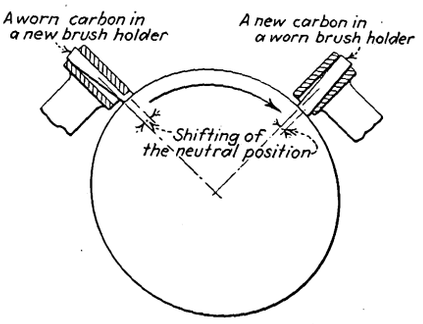
By John S. Dean
Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa.

PRACTICALLY all railway operators appreciate the importance of setting brush-holders on the neutral position, which on nearly all standard railway motors is in line with the centers of the poles. This location is determined by the throw of the leads on the armature coils, which as a rule is equally spaced around the center line of the coil. There are some few machines made where for special design reasons the leads are unequally spaced. On these the brush-holders do not line up opposite the center lines of the poles.

In the mechanical design of railway motors, the method of clamping the brush-holders to the frame is such that when properly adjusted they are drawn up securely into the correct neutral position. This is especially true with the more modern motors using the construction commonly known as the insulated pin type.

With the brush-holders properly adjusted on the neutral position, carbons that are badly worn on the side will shift the neutral position ahead on the motor, as shown in the accompanying illustration. With the modern ventilated motor the carbon brushes are subjected to excessive side wear due to the dust and dirt which are drawn through the motor. Before the brushes are allowed to wear $\frac{1}{16}$ in. as a permissible maximum they should be replaced, as the shifting of the neutral to a forward position tends to produce sparking and poor commutation.

Besides shifting of the neutral due to the side wear on carbons, badly-worn brush-holder carbon boxes also affect the neutral position. This is also shown in the illustration, from which it will be seen that this also tends to shift the neutral position ahead, which will cause the motor to spark and commutate poorly. It is important to maintain the carbon box inside dimensions quite close to the original gage limits. The maximum permissible limit of wear on the brush-holder box should not exceed $\frac{1}{32}$ in.



The above shows a worn carbon in a new brush-holder on the left, and a new carbon in a worn brush-holder on the right. Both affect the neutral position

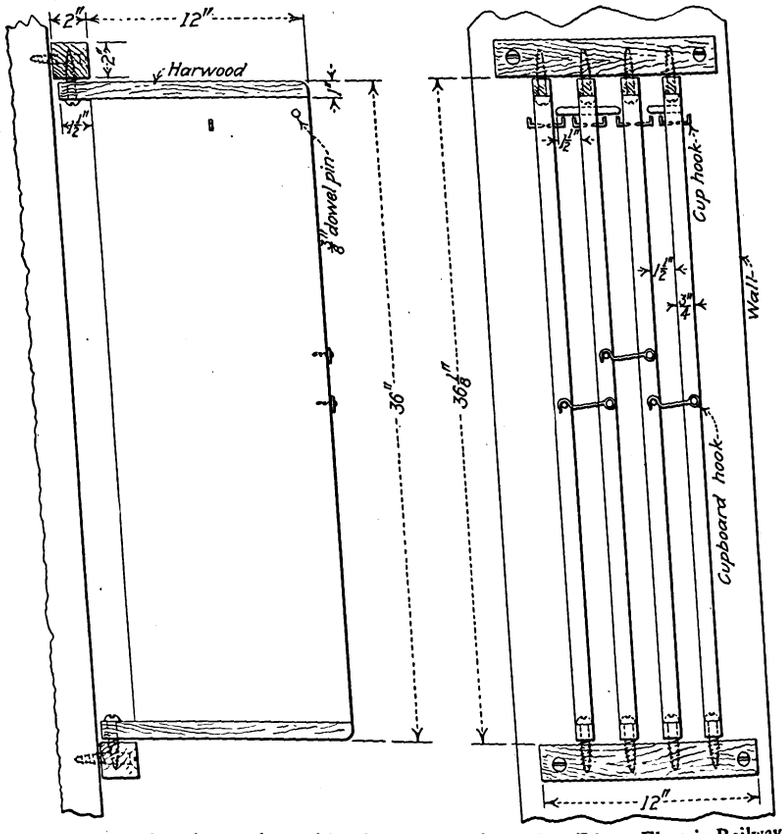
Either one of the conditions mentioned has a detrimental effect on the commutation, while a combination of both, which is quite frequent in service, tends to shift the neutral ahead to such an extent that the commutator sparks badly, frequently flashing from brush to brush and occasionally jumping to ground, causing the motor to blow. In addition, this poor commutation causes rapid wear, both of the commutator surface and the carbon brushes. From an economic point of view these defects justify correction. This can be accomplished readily by systematic inspection and better maintenance of these parts.

Book Type Gasket Rack*

By Charles Herms
General Foreman San Diego Electric Railway, San Diego, Cal.

GASKETS for bus engines are usually large and so require considerable storage space if each type is kept separate. If they are kept in piles damage is sure to occur, especially to some of the paper and cork types. For convenient storage which will take little room a gasket rack has been constructed in the shop of the San Diego Electric Railway. This takes care of all the gaskets in general use on the system. The rack occupies a wall space of 12x40 in., and if the gaskets which it accommodates were to be spread out on a flat wall,

**Submitted in* Electric Railway Journal *Prize Contest.*



Type of gasket rack used in the garage of the San Diego Electric Railway

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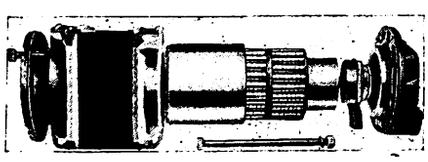
the space required would be 36x96 in. The rack is made in book form with four panel wings. Any desired number of hooks may be fastened to each side of a panel, and of course any number of wings may be used, depending on the number of gaskets stored.

A label is placed over each hook to show the particular type of gasket to be carried on it. Hardwood dowel pins glued in place prevent wings from touching each other and causing the gaskets from the opposite wing to be caught on the hooks of another wing. End hooks are provided to hold the wings together and eliminate flapping at random.

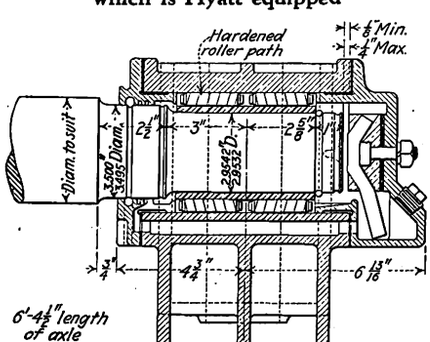
New Equipment Available

Roller Journal Bearing

DESIGNED to meet the demand for a journal bearing that requires no weekly or monthly inspection, the improved Melcher roller journal bearing has been produced by the Railway Motors Corporation, De Pere, Wis. This journal bearing interchanges with all A.R.A. standard equipment and is Hyatt equipped. It utilizes standard axles, is quickly and easily installed, and every part is accessible for inspection without removal from the truck.



A Melcher roller journal bearing assembly which is Hyatt equipped



Cross-section of the type K 3¼x6 Melcher roller journal for electric railway use

This journal includes both radial and thrust bearings, neither of which reduces the efficiency of the other, and lateral adjustment is easily made. The center member is reversible and is made of R.M.C. alloy noted for its wear-resisting qualities. The pedestal guides and equalizer seats are heat-treated and hardened and the finished surfaces are ground accurately to the size required.

The lubricating system constantly washes and cleanses the roller path of any foreign matter, thus increasing the life of the bearing. It circulates and filters from 15 to 30 drops of oil per minute under all temperatures. The normal operating temperature is only 10 deg. above atmosphere, and inspection or lubrication is only necessary every 100,000 miles. These bearings have been in operation for a considerable time on steam railways and a number of applications are now in operation on electric equipment.

Device For Testing Meters and Instruments

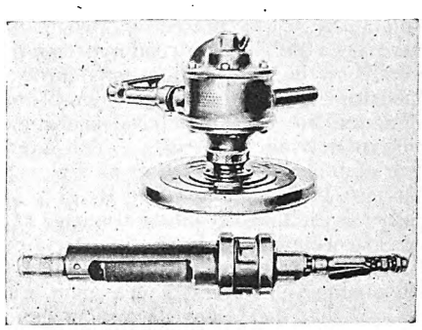
TEST blocks and plugs for making connections when testing meters, instruments and relays, have been developed by the General Electric Company, Schenectady, N. Y. The new line will be designated by the type number PK.

The blocks are essentially four-pole and six-pole jacks, provided with covers having internal plug contacts which make connection when the plug is in place. The four-pole and six-pole blocks have various combinations of auxiliary contacts which automatically short-circuit the current transformer when the cover is removed. Thus a block and cover are equivalent to a double-throw test switch.

Both test plugs are provided with studs and links and may be connected permanently to the testing equipment for any of the various test methods in use. Routine testing may be accomplished simply by removing the cover and substituting the properly connected test plug. Normal connections are restored by replacing the cover.

Improved Portable Grinder

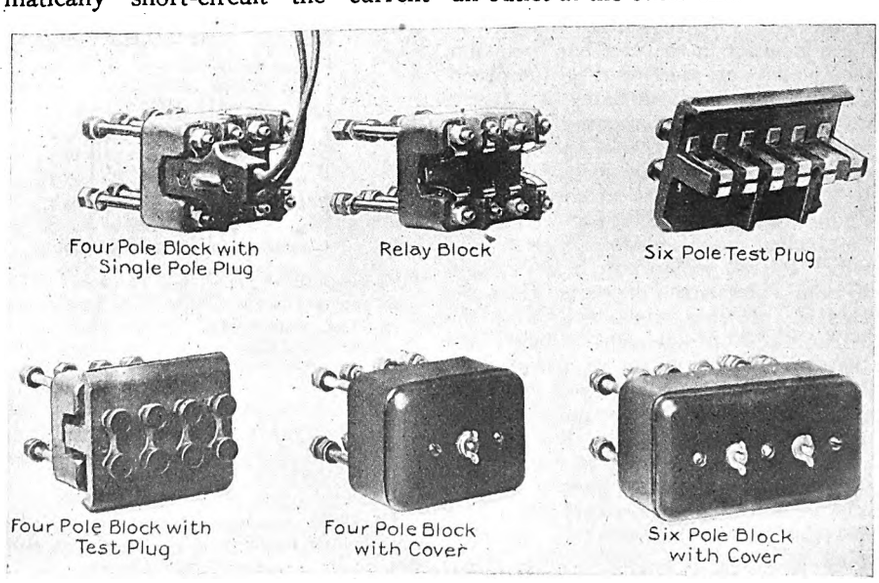
FOR grinding, sanding and polishing the Buckeye Portable Tool Company, Dayton, Ohio, has just announced the Hercules air tool. The rotary principle is used, compressed air acting against movable blades.



Air-operated tool—at top, sander; below, grinder

This is claimed to eliminate much of the vibration hitherto associated with air tools.

The only wearing parts of the new tool are the small blades in the rotor. For lubrication, grease is injected into the tool at one point and reappears at an outlet at the other end.



Four and six-pole relay blocks showing spring jacks and plugs, and the arrangement of links and studs for making various connections

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Association Activities

Steam Railroad—Automotive Conference at A.R.A. Meeting

MEMBERS of the Motor Transport Division of the American Railway Association and representatives of the National Automobile Chamber of Commerce, the American Automobile Association, the Society of Automotive Engineers, and the Railway Supply Manufacturers' Association, participated in a general conference on June 23 at Atlantic City, on the occasion of the first annual meeting of the newly-organized Motor Transport Division of the A.R.A.

Sessions of the Motor Transport Division during the preceding two days were open only to railroad representatives, but the final session was thrown open for general discussion of problems of mutual interest to railroad and automotive transportation men. The question of interstate regulation of highway carriers, both passenger and freight, together with that of automotive rail car design occupied most of the attention during the meeting. In a preliminary statement A. P. Russell, chairman, explained that the Motor Transport Division was anxious to co-operate with others interested in the solution of problems incident to the development of highway transportation, and suggested that the question of the regulation of interstate vehicles was of paramount importance. He called upon A. J. Brosseau, vice-president of the National Automobile Chamber of Commerce, to voice the views of that body regarding interstate regulation.

Mr. Brosseau said that the difficulty in arriving at a satisfactory regulatory law is that of finding a common ground of thought. He suggested that one of the difficulties in the past has been that the policy of the several interested groups have been formulated by lawyers instead of practical operating men. He said that the automobile industry has on several occasions given evidence of its interest and desire to co-operate in finding a proper basis for regulation, and called attention to the statement which he had made at the hearings held by the Interstate Commerce Commission, expressing the views of the N.A.C.C. This statement, in brief, held that only a certificate of convenience and necessity, together with adequate assurance of liability responsibility, is needed to insure healthy development of interstate highway transportation. Regulatory legislation covering trucks was opposed on the ground that these vehicles in most instances are not operated as common carriers. Mr. Brosseau was hopeful that a fair and reasonable solution of the bus regulation problem can be found, and said that although the automobile industry has at times opposed specific regulatory bills, it is not opposed to the principle of regulation of common carrier highway vehicles.

C. S. Sale, president American Car & Foundry Motors Corporation, suggested the need for uniformity of regulation regarding the dimensions of buses. He recommended that a uniform maximum width of 96 in. be advocated throughout the country. Speaking on the question of rail car design, he maintained that the weight of rail cars can be reduced and said that a 30 to 40-passenger rail car capable of operation at speeds of from 45 to 60 m.p.h. can be produced. Representatives of various railroads operating rail cars participated in the discussion and outlined some of the operating problems of branch line service which determine the type of automotive rail equipment demanded by the railroads. Although the advantages of a more frequent service which can be given with small light rail vehicles were emphasized, the trend of thought among railroad representatives was toward larger units capable of handling the wide variations in traffic encountered on branch lines.

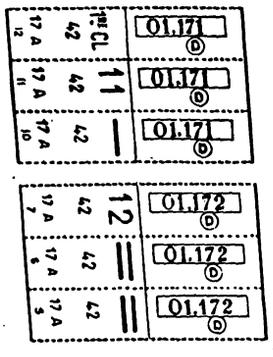
Paris Adopts New System of Fare Collection*

Offers 16 2/3 per cent reduction in rates to passengers who purchase coupon tickets in advance. Eighty-five per cent of passengers use the new system

By André Mariage

Chairman of the Board of the S.T.C.R.P. (Paris Surface Lines and Bus System)

FARES in Paris are based on the zone system, with a higher charge for the first zone than for each succeeding zone. There is also a difference in charge between first-class and second-class passengers, and these fares are still further modified by reduced round-trip workingmen's tickets, reduced rates for cripple war veterans, and double rates charged during certain hours of the night.



Reproduction of cancelled coupon. That at the left is for a first-class fare covering one section, that at the right for a second-class fare covering two sections

The practice has been to give each passenger paying fare a ticket or fare receipt, indicating the ride to which he is entitled and the fare paid. This has meant that the conductor has had to carry a large number of each kind of ticket. This he has usually done on a board which he has carried with him. On certain long lines where a board to carry all of these tickets would be unwieldy, the conductor has been supplied with two such boards, one to use, say, during ordinary hours and the other during the hours in which workmen's tickets are sold. As he has to issue the right ticket to each passenger, mark it with a pencil to indicate the zone and often make change he has a great deal to do. In an effort to reduce the work of making change, the company tried the plan of issuing fare tokens at their cash value, but as few passengers purchased them, no great saving in time resulted.

New system of fare collection

The principle by which these fare receipts are supposed to protect against fraud is that as they carry a serial number assigned to the conductor of that car, they are good only on the car on which they are issued. A record of these serial numbers is kept in the office of the company, and periodical checks are made of the tickets issued to passengers on individual cars to see that there is no trading in tickets,

**Abstract of communication presented at the biennial meeting of the Union Internationale de Tramways, de Chemins de fer d'Intèret Local et de Transports Publics Automobiles, held in Rome, Italy, May 6-12, 1928.*

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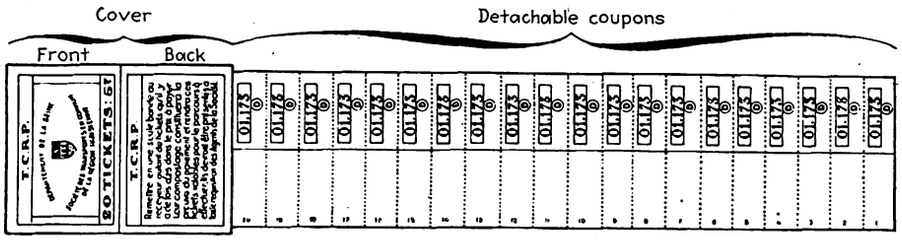

Coupons are sold in strips of twenty at a reduction of one-sixth over the cash fare

overriding or use of expired tickets.

In the new system adopted, the work of the conductor has been greatly reduced, as it has been changed almost entirely to that of cancelling rather than that of issuing tickets. The system is based on the following principles:

1. Where there are various rates of fare for different lengths of rides and different classes of accommodation, these rates should be multiples of a common factor.

2. The coupons issued to cover all rides should be of the same kind, and the unit value of each should correspond with the value of the common denominator mentioned in condition 1.

3. When these tickets or coupons are cancelled on the car, the cancellation should be of such form as to indicate the length of ride for which they have been accepted, and the cancelling apparatus should be arranged so as to totalize the receipts as well as the number of travelers in each class.

4. It is desirable to make obligatory, so far as possible, the use of these coupons for passage. Otherwise, it will be necessary for the conductors to carry not only the new cancelling machine but also all the equipment formerly used, such as assorted packages of tickets, change bags, ticket recording blanks, etc.

5. If it is not possible to make all passengers buy coupons, a special inducement should be given to those who do so, the purpose being to reduce the number paying cash for fares to the smallest number.

6. For this final group of passengers some system should be devised by which the new equipment can be used, so as to reduce the appliances carried by the conductor.

All of these conditions have been fulfilled by the system which we have on trial now on five of our city lines. Later it will be extended to the suburban lines.

The conditions were met in the following manner:

Thirty centimes were adopted for the common denominator of fares when paid in cash, and the fares were set as follows:

NEW SCHEDULE IN FRANCS OF CAR AND BUS FARES IN PARIS IF PAID IN CASH

Number of sections	1st Class	2nd Class
1	0.90	0.60
2	1.20	0.90
More than 2	1.50	1.20

If paid in tickets, the fares are as follows:

NEW SCHEDULE IN FRANCS OF CAR AND BUS FARES IN PARIS IF PAID IN TICKETS

Number of sections	1st Class	2nd Class
1	0.75	0.50
2	1.00	0.75
More than 2	1.25	1.00

It will be seen that these fares are all a multiple of the denominator 25 centimes and that they represent a reduction of $\frac{1}{6}$th from the fares paid in cash. The reduction given over the cash fare is so considerable that practically all regular users of transportation will purchase the slips. The coupons are sold in strips of 20 in the way illustrated. The price of the twenty-ticket strip is 5 francs (20 cents in American currency).

The special rates for crippled veterans and workmen were arranged as follows: The veterans are allowed to travel first-class and their rate of fare is 30 centimes for one section, 40 centimes for two sections and 50 centimes for more than two sections. Their coupon unit has been fixed at 10 centimes, making the cost for a twenty-coupon strip, 2 francs. For workmen, weekly tickets carrying a coupon for each day, one for the outgoing trip and one for the return trip are sold in advance. These coupons are cancelled by being punched by the conductor on the car.

Cancelling and Registering Machine

The cancelling and registering machine is carried by a strap around the neck of the conductor. It measures $7\frac{1}{4}$x$5\frac{1}{4}$x$2\frac{3}{4}$ in. and cancels the coupons by surcharging them. This surcharge gives: (1) the number of the machine, (2) the day of the month, (3) the trip number, (4) the class of accommodation, and (5) the numbers of the sections through which the passenger has paid to ride. Of these, only the two last mentioned have to be set by the conductor during the trip.

Typical cancelled coupons are illustrated. In the lower line, 17 is the day of the month and "A" is the route number. In the line above, 42 is the number of the cancelling machine. In the next line above, the first words indicate first class. If these words do not appear, the ticket is for second-class accommodation. The number 11 indicates the boarding station, and the one horizontal line on the third coupon indicates that one section only has been paid for. In the group of second-class cancelled coupons, the two horizontal lines show that two sections have been paid for.

The registering part of the apparatus totalizes the number of tickets cancelled and the number of passengers traveling first and second class.

Provision, of course, has to be made for passengers who insist on paying cash. The conductor sells them the number of special coupons which they require from a roll of 200 coupons which he carries, but charges them 30 centimes for each coupon instead of 25 centimes.

The coupons, after being cancelled, are retained by the passengers in the customary way until the end of their trip.

Practical Experience with the System

The company was anxious, of course, when the plan was started, to learn how many passengers would purchase tickets in strips. During the first days 30 per cent continued to pay cash, but in a short time this proportion shrank to 15 per cent, made up primarily of persons like tourists, who are either unacquainted with the system or who do not use the cars or buses often enough to warrant the purchase of a strip of coupons. The company believes from its experience on the five lines on which the system has been tried that this percentage of 15 will grow considerably less.

It has been found that by this system of fare collection the average time

COMING MEETINGS OF *Electric Railway and Allied Associations*

***July 8-12*—Public Utilities Advertising Association and International Advertising Exposition, Detroit, Mich.**

***July 12*—New York Railroad Club, annual outing, Indian Point, N. Y.**

***July 13*—A.E.R.A. Executive Committee on yacht "Florida," New York, N. Y.**

***July 17-20*—American Society of Civil Engineers, annual convention, Buffalo, N. Y.**

***July 19-21*—Pacific Claim Agents' Association, annual convention, San Diego, Cal.**

***July 25-27*—Electric Railway Association of Equipment Men, Southern Properties, Cincinnati, Ohio.**

***July 27-28*—Central Electric Railway Accountants' Association, Detroit, Mich.**

***Aug. 16-17*—Wisconsin Utilities Association, Transportation Section, Sheboygan, Wis.**

SEPT. 22-28, 1928

American Electric Railway Association, 47th annual convention and exhibit, Cleveland, Ohio.

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required by the conductor to collect a fare has been reduced at least 50 per cent. The saving is more than this, of course, when the time taken to make change is included. That took, on the average, 25 seconds per passenger, whereas the present system takes only seven seconds per passenger. This greater rapidity permits the conductor to watch more carefully for attempted fraud. The plan is very popular with the employees.

Another advantage of the present plan is the reduction of inspectors needed, as the work of the inspection of tickets is greatly simplified. The elaborate system of accounting in the office for tickets issued to conductors and the return by them of unused tickets is eliminated. Finally, the accounting for receipts and number of passengers carried is much reduced, as these figures are given on the totalizers on the cancelling machine.

Periodical Physical Examination of Trainmen*

By W. L. Weber

Chief Surgeon Pacific Electric Railway, Los Angeles, Cal.

FEW large corporations as a preliminary requisite to employment subject their applicants to a thorough physical examination. Fewer still conduct periodical health rechecks of their employees. Many concerns have no medical department at all. Some that have are more or less indifferent in their attitude toward the employee.

The Pacific Electric Railway Company employs some 6,000 individuals, who, excepting the Mexican laborers, are obliged to submit to a thorough medical examination before final acceptance into the employ of the company. This examination is made by a full-time doctor whose office adjoins that of the employment bureau, thus facilitating the handling of the men. This doctor's time is largely occupied in the examination of applicants and in the re-examination of men already employed.

The medical department has a full-time staff consisting of a chief surgeon and two assistants, three office nurses, and other clerical help. The office organization is quite complete, having a well equipped X-ray laboratory in charge of a competent radiologist and technician. There is a physio-therapy department and a full-time masseur. The laboratory work is done by a competent laboratory staff, the material being called for once daily and reported upon promptly. In addition, there are in every line specialists whose services are free to the employee. Perhaps one of the most valuable acquisitions to our medical department has been the installation of a dental clinic under the direct supervision of a competent dental surgeon. While not an integral part of the railroad organization, it is so closely associated with the men that it has become a definite and important factor in our organization. The charges for dental work are very moderate, being about half of that usually made for similar work done elsewhere. The dentists are not on a salary but make a charge directly to the individual having the work done. The service is extended to dependent family members as well as to the employee.

The aforementioned medical and dental benefits are derived through the maintenance of a hospital fund through pay roll deductions. The amount deducted varies from 50 cents to $1.50 a month, depending on the salary received.

With such an organization the re-examination and subsequent care of any number of cases can be effectually done. During 1925-26-27, 2,956 trainmen were re-examined. Up to 1925 the re-examination of trainmen took place every three years and consisted in testing visual acuity, auditory and color perception, and noting the general appearance of the applicant. Only in isolated instances was an applicant given a detailed examination. This may account, and probably does, for the large number of men found suffering from serious organic disease, as revealed by our re-examinations of 1925. Now the trainmen take this examination every two years and are not permitted to return to duty unless they present to their immediate superior a clean bill of health from the examining doctor.

The man to be examined removes all of his clothing, even to his shoes and socks. The examination takes in the general fitness of the applicant, the cardio-vascular system, the teeth and the nervous system. Blood pressure records are taken, including in all cases both the systolic and diastolic readings, and a urinalysis of a specimen voided in the doctor's presence. Vision, hearing, and color perception are carefully noted. Where a more detailed examination is required, such as X-ray of heart, lungs, gastro-intestinal tract, including the teeth, Wasserman tests of the blood or cerebro-spinal fluid, blood chemistry, etc., the patient is referred to the laboratory doing such work. All findings, whether normal or otherwise, are carefully recorded on the applicant's blank. These blanks at the close of the day are placed before the chief surgeon for inspection, and should any very serious defect be found the man is requested to return for further rechecking. However, should the examining doctor find any defect that in his judgment is of sufficient gravity to be a menace, the applicant is withheld from duty until further examination and disposal of the case can be made.

When the system of re-examination was first inaugurated, it created quite considerable consternation and ill feeling among some of the employees, but when they became convinced that they were the actual beneficiaries, and that it did not mean their loss of position, the feeling changed so that soon there were no more complaints. Instead of resentment the men welcomed the careful examination which they received.

The question as to the ultimate disposition of a given case in which a serious disqualifying defect might be found, naturally arises. In no case has an employee ever been discharged from service because of physical disability. Those men who were found suffering from organic disease of sufficient gravity to render them a hazard to the traveling public, their fellow employees or to themselves, were removed from the position and employment less exacting provided. Motormen with high blood pressure and serious heart disease are removed from the front end and given work as conductors, or at station, or trolley holding positions. Some were found to be too seriously ill to continue at any employment, and were given the benefits derived from their insurance in the Metropolitan Life Insurance Company. In other cases where the length of service warranted it, a monthly gratuity or pension is allowed in addition to their insurance, thus providing, at least, a living. We discovered a few platform men suffering from locomotor ataxia. These were transferred to station or similar positions and seemed to do quite well. At the present time one or two such are holding trolley jobs. They are carefully supervised both from a medical and efficiency standpoint. They report to the medical department at least once a month, and are carefully checked over for possible development of symptoms that would render them an unsafe risk, even in such a position as holding trolleys.

In 1925, 1,586 men were re-examined, and of this number 157 were instructed to return for rechecking. The following defects were found, which, in the great majority of cases showed improvement or recovery under observation and treatment: Glycosura, 21; hypertension and associated cardiac disease, 85; hernia, 24; visual impairment, 9; faulty color perception, 4; nephritis, 4; locomotor ataxia, 12; bad teeth, 73.

In 1926 there were 133 re-examinations and nine rechecks: Hypertension, 3; glycosuria, 1; disease of the nervous system (non-syphilitic), 3; visual impairment, 2.

The reason for the small number re-examined in 1926 was that the majority of the trainmen were checked in 1925.

*Abstract of a paper presented at the annual meeting of the California Electric Railway Association, San Francisco, Cal., May 7-8, 1928.

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In 1927 1,237 men were re-examined, and of this number only 84 were instructed to return for rechecking. The defects noted were as follows: Hypertension and associated cardiac disease, 42; cardiac disease without hypertension, 6; glycosuria, 17; locomotor ataxia and nervous syphilis, 6; cardiovascular syphilis, 3; nervous system disease, 8; visual impairment, 9; auditory defects, 2; impairment of color perception, 3; thyroid gland, 1; nephritis, 1.

There can be no question but that tremendous benefits have accrued to the men. Almost all have co-operated in a most satisfactory manner in the effort to detect disease and improve their health. The fact that in 1927 our X-ray laboratory took 1,000 more dental X-rays than in 1926 shows conclusively that the employee appreciates the value of detailed and careful physical examination.

Since most of the defects noted were for arterial hypertension and associated cardiac disease, the possible cause, or causes, becomes interesting and important. The majority of our cases occurred among the motormen, and I am inclined to believe that the nervous strain incidental to running high-speed trains where traffic is frequently crossing the tracks, must be a factor. I also believe that since their occupation is largely sedentary, combined usually with overeating and consequent overweight, that these latter factors also play a considerable part in causing hypertension. I do know that the majority of these men showed marked improvement under proper dietary regime and elimination through skin, bowels, and kidneys. Any case showing a blood pressure in excess of what should be normal for his years is rechecked and made to report at stated intervals. A systolic pressure of 180 mm. disqualifies for the work of motormen—a diastolic pressure of 100 mm. or over also disqualifies, no matter what the systolic pressure may be.

American Association News

Engineering Executive

DISCUSSION of work done during the year by various committees, approval of the program for the sessions of the Engineering Association at the coming convention and many other routine matters formed a busy session of the executive committee of the American Electric Railway Engineering Association, at association headquarters, New York, June 13. Those present were: President R. H. Dalgleish, chairman; F. H. Miller, W. W. Wysor, C. H. Jones, L. D. Bale, P. V. C. See, F. McVittie, E. M. T. Ryder, J. W. Welsh, John Y. Bayliss, H. F. Brown, H. H. George and A. T. Clark.

A report of work being done in the rolling stock division was presented by A. T. Clark, chairman of the general rolling stock committee. In addition to the regular assignment, several special ones which have come up during the course of the work were reported on by Mr. Clark. These included the designing of a new standard axle and a study of lamp sockets for 20-in series lamps.

Work in the purchases and stores division was reported on by John Y. Bayliss. A request for the organizing of a joint committee with the National Electric Light Association to consider certain subjects of mutual interest was approved, as was also another request for arrangements to co-operate with committees of the National Association of Purchasing Agents, the National Electric Light Association, and the American Railway Association, in a joint study to establish standard packages for storeroom material. John Fleming was appointed as a representative of the purchases and stores division, to co-operate with the United States Department of Commerce.

A report of the committee on revision of the constitution and by-laws was discussed and approved with certain revisions. H. H. George presented a very complete report for the program committee covering the coming convention. It was voted to publish all advance papers for early distribution.

Correspondence covering many suggestions for subjects to be considered during the coming year were discussed, and these were referred to the subjects committee. The following personnel changes on A.E.S.C. committees and those co-operating with other societies, were approved: Messrs. H. W. Codding and W. E. Bryan were appointed as representatives of the Association on the sectional committee on mercury arc rectifiers. H. E. Bachman was appointed to the place made vacant by the resignation of M. B. Rosevear, on technical committees 5 and 10 of the sectional committee on insulated wires and cables.

Charles R. Harte was appointed to represent the association at a conference called by the American Society of Mechanical Engineers in connection with the co-ordination of standardization activities in the mechanical industries. L. D. Bale was appointed to represent the association at a meeting of the fuels division of the American Society of Mechanical Engineers to be held in Cleveland, Sept. 17 to 20. W. W. Brown was appointed to represent the association on the advisory board of the Power Transmission Association.

It was voted to endorse the report of the revision conference on classification of iron and steel scrap put out by the Division of Simplified Practice of the United States Department of Commerce. Recommendation No. 71 on turnbuckles was also endorsed.

Power

JUNE 11-12 the final meeting before the Cleveland convention of the standing committee on power was held at association headquarters, New York City. Those present were W. E. Bryan, chairman; C. S. Anderson, J. W. Allen, W. H. Bassett, L. W. Birch, H. W. Codding, H. A. Kidder, John Leisenring, H. S. Murphy, J. F. Neild, F. W. Peters, W. J. Quinn, J. L. Ross, Dwight L. Smith.

Special committee No. 1 on Manual review presented a final report, which has been sent out to the various members of the standing committee for ballot. A revised report on mercury arc rectifiers was presented by special committee No. 2. This will be sent out for approval later.

Due to recent changes in the chairmanship of special committee No. 3 on power costs and power contracts, data have not yet been compiled. A questionnaire has been prepared to be sent to member companies. The questionnaire was discussed in detail and a number of changes suggested. The questionnaire was then referred back to the committee for revision. A formal report on catenary construction was presented by special committee No. 5. Suggestions for some changes were made by the general committee. Special committee No. 6 on trolley wear and breaks reported that it is compiling results of a questionnaire sent to member companies. This information will be in shape for approval soon. Regarding other assignments to the committee, no definite conclusions have been reached.

Special committee No. 7 on inductive co-ordination and radio interference has presented its final report, which has been sent to members of the standing committee. The report was reviewed for further suggestions. Special committee No. 8 on trolley wire reels submitted a formal report. After discussion it was decided that several minor changes were advisable in the drawings of the reels. These will be made and the report sent out for approval.

The report of special committee No. 9 on underground conduit specifications was discussed in considerable detail. It is proposed to substitute revised drawings in place of the present Manual drawings after these have been rechecked. Designs of manholes will be treated as a recommended design.

Special committee No. 11 on overhead versus underground distribution cable presented a progress report, but stated that information following the questionnaire as to cost, operation, etc., of underground and overhead cables was still being received. No conclusions were reached by the committee.

Special committee No. 12 on ferrous versus non-ferrous overhead material, and No. 13 on trolley voltage in congested districts did not present reports.

A program for the various sessions of the power division at the Cleveland convention was agreed upon. These were presented to the program committee and also to the executive committee for consideration.

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News of the Industry

Cardinal Fliers Organized

Transportation men embark on new venture looking toward cross-country service via the air

TO PROVIDE air transportation from Louisville, Ky., to any point between the United States and Canada within the next few years is the dream of James P. Barnes, president of the Louisville Railway, and Lee L. Miles, president of the Louisville Taxicab & Transfer Company, who recently organized the Cardinal Fliers, Inc. This company caters to general cross-country taxi and sightseeing work and has under negotiations the matter of contract with the United States Government for transportation of mail on its newly developed air routes. At the present time the regular operation consists of handling newspapers for the *Courier Journal* and Louisville *Times* between Louisville and Lexington. Flights have been made by planes of the Cardinal Fliers, Inc., to Atlanta, Philadelphia, New Orleans, Little Rock, Hot Springs, St. Louis, Chicago, Grand Rapids, Detroit, Buffalo and Kansas City, Mo.

The company was originally incorporated, early in March, with a capital of $50,000, but since then the industry has made such strides that at a meeting of stockholders the last of May, the capitalization was increased to $250,000.

The equipment of the company at the present time consists of five open Waco planes and one Fairchild cabin plane. An order has been placed for two additional cabin planes, and one Whirlwind Waco open cock-pit plane, the latter being equipped for night flying. In addition the company is local agent for the Monocoupe, equipped with a five-cylinder radio motor, manufactured by the Velie Auto Manufacturers, and also for a two-passenger cabin plane. The five-passenger cabin planes operate on the basis of 50 cents per air-mile and the three-passenger open plane on the basis of 25 cents per air-mile.

At a municipal election in November, 1927, a bond issue of $2,000,000 was approved by the voters of Louisville, $750,000 of which was for the purpose of park work, including the establishment of a municipal air port in what has been known for several years as Bowman Aviation Field. The company has just been allotted a location in Bowman Field approximately 80x200 ft. for the construction of hangars, and adjacent will be terminal buildings and offices.

The backers of the Cardinal Fliers, Inc., are men of experience in transportation matters. They are anticipating the establishment of cross-country service in conjunction with other commercial aviation companies. At the present time the company is planning the establishment of part air and part rail trips across the country, using airplanes, for instance, from Louisville, Ky., to Omaha, Neb., traveling on sleeper by night for a portion of the journey, and making the final hop to the Pacific Coast by air. As an alternate the combination of commercial air companies has in mind flights by day, possibly from New York City to Louisville, spending the night in Louisville, hopping thence from Louisville to Denver, Col., spending the night in Denver, and hopping the third day to the Pacific Coast.

Lee L. Miles, president of the Louisville Taxicab & Transfer Company, is president of Cardinal Fliers; Saunders P. Jones, capitalist, is vice-president; Houston Quinn, former Mayor of Louisville and vice-president of the Louisville Trust Company, is treasurer, and Miss Mary E. Clines of the Louisville Taxicab & Transfer Company, is secretary.

The board of directors consists of James P. Barnes; Graham Brown; A. H. Bowman; C. C. Webb; W. W. Crawford and J. C. Willson.

Flat Eight-Cent Fare in St. Louis

State commission passes upon plea made originally by receiver of United Railways, since succeeded by St. Louis Public Service. Valuation $60,000,000

THE St. Louis Public Service Company has been authorized by the Missouri Public Service Commission to charge a flat 8-cent fare for adult passengers and a 3-cent fare for children between five and twelve years of age in all of the fare zones of St. Louis and St. Louis County, effective July 1. Eight cents cash or two tokens for 15 cents for adults and 3 cents for children were the former rates. The commission also found the value of the property of the company used and useful for transportation service to be $63,500,000 and the property not used for public service $2,500,000, a total of $66,000,000. This compares with the former valuation of $52,000,000, or an increase of $14,000,000. The commission also allowed the company to charge $800,000 annually for depreciation.

How Contentions Differed

The company, in its application for the higher fare, had sought an 8-cent flat fare, a valuation of $75,000,000, a rate return of 8 per cent and a depreciation allowance of $1,500,000, while the city of St. Louis in resisting the application contended for a fare of 7½ cents, $53,000,000 valuation, a 7 per cent return, and only $1,000,000 depreciation. The commission anticipates that the new fare rates will return the company 7.14 per cent net on the $63,500,000 valuation. This is based on the passenger business of the system in 1927. A continuation of the universal system of transfers was recommended.

On the basis of past experience the commission estimated that in 1928 252,392,464 adult passengers will be carried at 8 cents for $20,191,397 and 6,418,512 children at 3 cents for $192,555, making total gross revenue from passengers $20,383,952.

A recapitulation of the commission's findings shows:

Net revenue available for return in 1927, $2,360,990; estimated increase in revenue, $1,792,740; decrease in depreciation reserve, $700,000; grand total, $4,853,730. From this amount must be deducted the $318,323 increase in income taxes, leaving an estimated $4,525,407 available for dividends.

Explaining its decision to cut the depreciation reserve the commission said:

In view of past expenditures, the present large reserve, and the present physical

Neither Company nor City Satisfied

THE St. Louis Public Service Company on June 28 applied to the Missouri Public Service Commission for a rehearing, contending for a $75,000,000 valuation and claiming that $800,000 annual depreciation allowance is insufficient. The company conditionally accepted the 8-cent fare, but asked a rehearing on the valuation and depreciation items. It said the return should be 8 per cent instead of the 7.14 per cent allowed, and that the commission failed to make due allowances for intangibles and erred in allowing only $3,000,000 instead of $8,700,000 for going value.

City Counselor Muench has stated the city will also ask for rehearing, but did not announce the basis for such appeal. It also probably will attack the $63,500,000 valuation fixed by the commission as too high.

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condition of the property, as compared with conditions in the past, the commission is of the opinion that $800,000 is a reasonable and just amount for this company to place yearly in its depreciation reserve fund.

The company has accumulated $8,500,000 in the depreciation reserve.

The commission allowed $3,000,000 for "going value" and $2,042,164 as working capital.

The capitalization of company is $50,843,020, leaving an excess of valuation over capital of $15,156,980.

In arriving at the $66,000,000 valuation the commission took a middle of the road course, as the $63,500,000 valuation on the operating property practically "splits the difference" between the $75,000,000 asked by the company and the $53,000,000 contended for by the city. The set-up is:

Original cost physical property other than land	$49,355,565
Reproduction cost physical property (estimated)	73,392,609
Reproduction cost less depreciation	55,044,457
Land (present fair market value)	4,700,000
Cost of franchises, amounts actually spent	208,522
Materials and supplies	1,442,164
Cash working capital	600,000
Going value	3,000,000
Rate-making valuation	66,000,000

In this connection the commission's ruling in part reads:

The commission is of the opinion that stress should not be put on either the original or reproduction cost of this property. The commission is attempting to fix a value that will keep the car-rider from seeking some other means of transportation and at the same time give the company a return as nearly just as is possible and still keep its customers. The commission believes that an 8-cent adult fare will not produce excessive return.

The estimated net return of $4,535,407, which the 8-cent fare is calculated to produce, is sufficient to pay $1,884,975 interest on all the outstanding bonds and the $494,294 needed for the 7 per cent dividend on preferred stock. This will leave $2,156,183 available for return to the holders of 343,645 shares of common stock, or $6.28 a share. This stock was issued at $12.50 a share, but had an actual valuation of about $18.50.

Under the commission's ruling the book valuation of the common stock has been greatly increased. The total of all the outstanding bonds and preferred stock is $46,547,458. This sum deducted from the $66,000,000 valuation leaves $19,452,542 valuation for the common stock, or $57 a share.

However, the calculations of estimated net return for the company have not taken into consideration any probable increase in wages for the platform men and shop workers affiliated with the Amalgamated Association. The Public Service Commission has been selected to arbitrate the differences between the company and its workers on the wage question. The commission probably will not give its final decision in the wage question for many weeks. Neither side has presented its evidence to the commission.

The St. Louis Public Service Company on June 23 asked the Missouri Public Service Commission to establish an 8-cent fare in each zone on the Missouri Electric Railway operating between Wellston and St. Charles, Mo., and its branch lines, effective July 1. In the past the fare on that line has followed the rates fixed for the St. Louis city lines, which on July 1 advance to a flat rate of 8 cents for adults and 3 cents for children.

S. W. Greenland, vice-president and general manager of the company, believes that the 8-cent fare will produce far less additional revenue than anticipated by the commission. He pointed out that when the state commission fixed the rate at 8 cents or two tokens for 15 cents it estimated that the company's revenues would be increased $1,250,000 a year, but while the period covered in this estimate expires on July 5 present indications are that the increase will not exceed $500,000. The reason has been the progressive decline in street car travel.

The company is also facing higher operating costs due to the demands of the Amalgamated Association for increased wages for carmen and shop workers of from 5 to 10 cents an hour. Company officials estimate that if these demands are met in full the payrolls will increase $1,800,000 a year.

Subway System Suggested in Cleveland

Local railway not committed at present to $30,000,000 project. Plan is to make new line pay for itself out of earnings

THE "penny subway" proposal, first broached two years ago, has come to the front again in Cleveland, Ohio. Raymond Cragin, author of the plan, announced recently that financing is assured and he has submitted to the City Council an ordinance authorizing the Cleveland Subway Company to build subways to cost $30,000,000, to be operated by the Cleveland Railway when complete.

The name "penny subway" is derived from the method of financing. The plan is to allot 1 cent out of each car fare paid the Cleveland Railway for the next 35 years to a fund to pay 6 per cent interest on the $30,000,000 bond issue and at the same time amortize the principal.

A limit of $30,000,000 of construction is fixed because it is estimated that 1 cent on each car fare will produce enough to retire this amount in 35 years with a safe margin on the basis of the average number of fares collected each year by the Cleveland Railway for the last ten years.

Subway routes provided in the Cragin ordinance are:

Two-track subway in Superior Avenue Northwest, connecting with the lower deck of the Detroit-Superior high level bridge and looping under the Public Square.

Four-track subway in Superior Avenue Northwest, starting at East Twelfth Street and with two loops under the Public Square.

Two-track, subway connecting with the East Superior subway at Payne Avenue Northeast, entering Chester Avenue Northeast at East Thirteenth Street and proceeding east under Chester and the proposed Chester extension, connecting with Euclid Avenue surface tracks at University Circle.

If sufficient balance is left in the $30,000,000 fund when these units are built, the following lines will be built under the ordinance:

Two-track subway in Ontario Street from Woodland Avenue Southeast to to the Public Square.

Two-track subway in West 25th Street from the lower deck of the Detroit-Superior high level bridge to a point south of Lorain Avenue, with a branch in Lorain Avenue to a point beyond West 28th Street.

The ordinance provides in addition that the Council may substitute new routes for any of those specified, provided the cost of the new route keeps the total cost within the limit of $30,000,000

The entire $30,000,000 will be furnished by the Equitable Trust Company, New York, Mr. Cragin said. The profits of the Cleveland Subway Company are to be derived from two sources—advertising concessions in the subway stations and the difference between the rate at which it can borrow money and the 6 per cent charge which is to be met by the car riders out of fares.

Under existing provisions of Ohio law, a municipality is not permitted to own stock in a public service corporation furnishing transportation. But if the city ever acquires the right to take title to the subways, it may do so any time after their completion. In the meantime, the title is to be vested in a trustee. But when they are paid for the lines will be the property of the city.

The ordinance also contains provisions that the city may contribute

Bright Red Trains

ALL passenger and freight cars of the Arkansas Valley Interurban Company, operating between Newton, Wichita and Hutchinson, have been painted a bright red and equipped with musical whistles. Officials declare that motorists can see a red car at a greater distance, and the new color therefore should aid in reducing accidents.—*Topeka Capital.*

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money from taxation or other sources to the funds used for subway construction, so that the proposed subway system may be extended as the need arises.

Opposition to the Plan Develops

Opposition to the plan developed even before the ordinance was introduced in the Council. One bone of contention is that the method of financing would place the entire burden of construction on the car riders and that no part of the cost would be paid by automobile drivers and owners of property specially benefited. Opponents of the Cragin plan also have said that if the city intends to assess subway construction costs solely against car riders, the city could direct the Cleveland Railway to build subways and the Cleveland Railway could finance the job through bonds at less than 6 per cent, or issue stock at 6 per cent, which would not require the accumulation of a retirement fund.

The Cragin ordinance cannot go into effect, even if passed by the City Council, unless it is approved by the Cleveland Railway. Officials of that company were unaware of the details of Mr. Cragin's plans until they were announced in the newspapers. Joseph H. Alexander, president of the company, has declined to comment on the plan, beyond saying that the company had not been consulted and had not entered into any commitments.

McGraw-Hill and Shaw Company Merge

Consolidation affects twenty engineering and industrial papers and "Magazine of Business," "System" and "Industrial Distributor and Salesman"

A CONSOLIDATION affecting two large publishing interests was brought about on June 29 by the merger of the McGraw-Hill Publishing Company, Inc., of New York and the A. W. Shaw Company of Chicago.

Two reasons for the merger are stressed by the officers of the merging companies. The magazines of the two organizations are complementary in character. The Shaw papers cover business broadly, giving the business man an understanding of what is going on in all branches of trade, industry and finance. Their service is extensive in character. The McGraw-Hill service, on the other hand, is intensive. Its magazines afford a highly specialized service to given major industries and to related industrial groups. Thus the consolidated companies serve the business man in both his general and special business interests. The second reason is the very evident economy and increased effectiveness of consolidated operation, enabling a superior service to be rendered to the whole sweep of American business. A statement by Mr. Shaw said:

It is gratifying to me after long years spent in developing the Shaw publications to have them put together with the strong group developed under Mr. McGraw's leadership. The combination will strengthen both groups. *The Magazine of Business* and *System* cover broadly the problems of all business, and exchange knowledge between its different divisions. The McGraw-Hill papers specialize on the problems of a dozen or more major branches of industry and trade. The advantages of joint control of these related but differing publications is apparent.

The merger comes at a particularly gratifying time, when the Shaw organization, following a plan long contemplated, is re-establishing *System*, the pioneer general business paper and for more than 25 years the guide, philosopher and friend of tens of thousands of men conducting the smaller businesses of this country and the administrative work of the larger ones.

In his comment Mr. McGraw said:

Mr. Shaw's organization and ours have been working closely together for more than a year. It was apparent that the McGraw-Hill group of industrial and trade papers would have a new way of carrying the message of common business problems if it was allied with papers like *The Magazine of Business* and *System*. At the same time these publications would be immeasurably strengthened by being tied in with and assisted by the great editorial staff of more than 130 industrial and business specialists who edit the McGraw-Hill papers.

Every paper of the merging companies will be strengthened by the consolidation, and thus render greater service to its readers and advertisers, but the most conspicuous result will be the new and strong position of *The Magazine of Business*. Through Mr. Shaw's vision and courage it is a magazine of strength, standing and influence. It now becomes the capstone of the virile group of papers and the other publishing activities of the McGraw-Hill company, thus extending the scope of the latter organization to the whole range of American business. At the same time, drawing on the intimate contact with trade and industry of the large corps of McGraw-Hill specialist editors, it will speak with unexampled authority on the problems of business. It will be able to render an outstanding service to the business men of America by its authoritative information, its expert interpretation, and its fearless advocacy of sound business policies. It will fight for the interests of business but it will place in an equally important position the responsibility of business to the public. It will, in a word, stand for true business statesmanship.

A. W. Shaw will continue as chairman of the board and James H. McGraw will become president of the A. W. Shaw Company. Mr. Shaw will also become a director of the McGraw-Hill Publishing Company, Inc., and will continue as president of the McGraw-Shaw Company. Mr. Wheeler Sammons will become a director and member of the executive committee of the McGraw-Hill Publishing Company and senior vice-president and general manager of the A. W. Shaw division of the business, which will be known as the "A. W. Shaw Company, a division of the McGraw-Hill Publishing Company, Inc." The McGraw-Shaw Company will also be operated as a division of the McGraw-Hill Publishing Company.

The Shaw organization publishes *The Magazine of Business, System,* and *Industrial Distributor and Salesman,* while the McGraw-Hill organization is the publisher, either directly or through subsidiary and affiliated companies, of more than twenty leading business papers, and of engineering and business books. Among its papers are Electric Railway Journal, *Bus Transportation, Electrical World, Engineering News-Record, Power, American Machinist Engineering & Mining Journal, Chemical & Metallurgical Engineering* and *Radio Retailing.*

The two companies have had a close relationship since last fall when they jointly formed the McGraw-Shaw Company, which publishes *Factory and Industrial Management* and *Industrial Engineering.*

Another Strike Vote in Connecticut

A strike of employees of the Connecticut Company, New Haven, Conn., was scheduled to begin at midnight June 24, but was postponed. It was given out by those interested in affairs of the employees that a new vote would be taken at once on the matter of going on strike, as it was explained that many voted in favor of a strike without knowing it. The next vote will involve the simple question to each voter: "Are You Willing to Go on a Strike?"

J. T. Reardon, Worcester, Mass., international official of the Amalgamated Association, explained the decision to hold the strike in abeyance was due to a misunderstanding of the ballot on the part of the men. Another ballot was desired now so there would be no further misunderstandings.

The Connecticut Company offered a renewal of the wage agreement, which terminated on June 1. The wage demands call for an increase from 62 to 75 cents for both men on the two-man cars and proportionately more for one-man operators.

Committee Will Solve Boston Problems

Under an order adopted by the Massachusetts Legislature, after such action had been requested by Governor Fuller in a special message, a special committee of four senators and eleven representatives has been appointed to draft new legislation for the solution of the Boston Elevated Railway problem in Boston. The public hearings were started on June 21, but the public failed to respond and the committee then went into executive session. The committee will now study material at its disposal, such as reports and plans, and formulate a bill to submit to the Legislature which is waiting to receive it.

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Progress in Toledo

Toledo's new transit plan, which provides for a monopoly of bus and railway service under the Community Traction Company, operation for at least five years, establishment of at least fifteen bus lines and extension lines, and a general rehabilitation program in addition to financing and power rate helps for the company, will probably go into effect on July 5 without interference.

Officials of the company have closed options for the purchase of the Ottawa Motor Coach, Inc., which operates fifteen buses, and for the Elm Street line, which has been operating eight buses. The new plan prohibits an independent line from operating within a quarter mile of any company-operated service and it is now believed that since the two most important independents have been purchased there will be no referendum on the ordinance and no challenge made by any of the smaller operators.

The Community Traction Company, had previously agreed to a plan of purchasing all independent bus lines at their physical value as determined by an independent commission appointed by Mayor William T. Jackson. Serving on the commission are James Aitken, radio dealer, Ben Groenewold, who is in the storage business, and Walter Stoepler, who is in the coal and cartage business. They have valued several of the properties but owners of the bus lines have been closing with the railway before announcement of the valuations.

The new power rate specified under the agreement has been approved by the Ohio Public Utilities commission. It provides for a refund to the railway of $2,500 monthly by the Toledo Edison Company, for five years, and a new rate on a flat basis of 1.25 cents per kilowatt hour measured on a.c. basis without any demand or service charge.

North Shore Summer Trips

Special excursion trains are being operated by the Chicago, North Shore & Milwaukee Railroad each Sunday during the summer months between Chicago and Kenosha, Racine and Milwaukee, Wis., according to the new "bargain rate round-trip" policy announced by North Shore Line officials. The excursion specials leave Chicago and Milwaukee early in the morning and make the return trips late in the evening. This gives all those taking advantage of the special rates almost a complete day in whatever city they choose to visit. All-steel equipment is used on the excursion trains. Descriptive literature dealing with the various cities on the schedule is distributed to passengers en route.

In addition preparations have been made by the North Shore Line to furnish special service direct to the gates of Ravinia Park during the summer opera season. For the convenience of Chicago and suburban residents a special train will be operated each evening during the opera season, arriving at Ravinia Park just before the program starts and leaving immediately after the performance. Chicago and suburban music lovers will also be afforded special facilities for reaching Ravinia Park on regular trains, according to an announcement by J. W. Simons, superintendent of transportation.

Special opera tickets, including round trip fare and admission to Ravinia Park, may be secured at North Shore Line stations. Tickets for seats in the open-air theater must be obtained through the opera ticket office.

Reduced Mileage Books in South Bend

A reduction of 15 per cent in the price of commutation mileage books between any two stations on the system has been announced by the Chicago, South Bend & Northern Indiana Railway, South Bend, Ind. Books containing coupons worth $5 in straight cash fares may now be purchased at $3. The old rate was $3.75.

New York Surface Lines Asks Increase

The Dry Dock, East Broadway & Battery Railroad, New York, has applied to the Transit Commission for a 7-cent fare, effective as of July 24. The 7-cent fare schedules were referred by the commission at its meeting to Clarence M. Lewis, the commission's general counsel, for an opinion. The current fare is 5 cents.

The outstanding stock of the Dry Dock, East Broadway & Battery Railroad is owned by the Third Avenue Railroad. The Dry Dock operates from 6 to 8 route-miles of road in the East Side district of New York City.

The Drydock, organized in 1863, operates under a franchise granted by the Legislature under the railroad laws of 1860. Inasmuch as company functions under a franchise, the status of the present application differs from that of the Interborough, which is operating under a contract with the city. If the commission decides it has jurisdiction in the matter, it may suspend the increased rates and hold hearings on the justification for a higher fare.

Excursion Rates in Indiana

Permission to establish for a trial period a reduced "excursion" fare of 50 cents between Gary and Valparaiso, Ind., was granted recently by the Indiana Public Utilities Commission to the Gary Railways. The new rate, which will become effective July 1, is, in fact, a one-way fare and represents a reduction of 10 cents below the former single-trip rate. A corresponding reduction will be established at the same time between Gary and intermediate points on the Valparaiso interurban line and a cut from 24 cents to 15 cents in the regular one-way fare between Gary and Indiana Harbor. The new tariffs will in no way affect or supercede the 25-cent Sunday pass established by the company on all lines last spring.

Upholds Fare Increase in Philadelphia

The United States District Court has ruled the Public Service Commission has a right to grant the Philadelphia Rapid Transit Company, Philadelphia, Pa., increases in fare notwithstanding the 1907 agreement which stipulated a 5-cent fare. In reaching this ruling, the court dismissed an equity suit of George Sambor and John J. Mullin, taxpayers, for an injunction to restore the 5-cent fare and a refund to the city of $79,800,000 in fares.

Complainants previously had said they would appeal the case to the United States Supreme Court.

Hearing Set on Omaha Franchise

City Commissioners of Omaha, Neb., have set July 2 for a public hearing on the Omaha & Council Bluffs Street Railway franchise. The Council itself has agreed to the franchise in its present form. It calls for an election on Nov. 6 on the question of granting a 30-year franchise. The only change suggested by the Council from the draft as agreed upon between the corporation counsel and the Company is that the Council retain the control of stopping places for cars. This has reference to the skip-stop system, which the patrons, in a straw vote, recently decided to retain.

"When I accept this franchise," said President Shannahan, "I marry it; I accept it for better or for worse. The corporation counsel has included a provision that obligates the company to co-operate with the city in carrying it out. I enter into the agreement with no other purpose in view."

$9 Monthly Pass on Pacific Electric Suburban Line

The Railroad Commission on June 20 by informal action authorized Pacific Electric Railway, Los Angeles, Cal., to establish on less than statutory notice, effective July 1, a $9 monthly pass good for bearer and for any number of rides between Los Angeles and Santa Monica, Ocean Park and Venice.

The present 60-ride commutation fare is $11.65. The pass therefore will result in a reduction of $2.65 a month, in addition to giving the pass owner the privilege of additional transportation. The pass will be honored via either the Venice short line, Sawtelle line, or Hollywood-Venice line, and also be good on local street cars within the first zone of Los Angeles and within the 5-cent zone of Santa Monica, Ocean Park and Venice.

This reduced transportation is similar to the monthly pass now in effect between Los Angeles and Pasadena, and is established for an experimental period, July 1 to Oct. 31, 1928.

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A New Start in Chicago

Important change of procedure relied upon to bring success in committee's effort to reach satisfactory agreement

THE City Council of Chicago and representatives of the local transportation companies will join forces in a new attack on the baffling railway problem. Instead of seeking to obtain enabling legislation first and afterward drafting an ordinance, as contemplated in previous negotiations, the new plan will be to determine the basic principles and features of a satisfactory ordinance. These points will then be drafted into an ordinance and submitted to the voters next November. If then approved by them the ordinance will be presented to the Legislature at the session in January, 1929.

This decision was reached on June 21 at the conclusion of a conference between members of the Council's committee on local transportation and officials, attorneys and bankers for the Chicago Surface Lines and the Chicago Rapid Transit Company.

A sub-committee of Aldermen is to be appointed to represent the city in the new negotiations. The same committee will probably be asked to draft, in cooperation with company representatives, the enabling legislation to be presented jointly by the city and companies to the General Assembly. On previous occasions, enabling bills have been presented independently, first, in June, 1927, by the companies, and last May by the city, both sets of bills having been allowed to die in the Legislature.

With the resumption of franchise discussions in the City Council, prospects for the construction of a downtown subway system in the near future have once more begun to brighten. The latest move in this direction was a request by Michael J. Faherty, president of the board of local improvements, for an appropriation by the City Council of $647,000 to finance the preliminary work of planning the underground system. This money would be spent for engineering and legal aid and for the building of a $25,000 model subway to be used in the trial of special assessment cases in court. Maintaining that a subway is, in reality, a lower level street, Mr. Faherty believes that it can be built and paid for like any other local improvement by special assessments and without additional legislation.

Consideration of Mr. Faherty's request for an immediate appropriation was continued until the next meeting of the Council on the plea that it would be unwise to build a subway without first obtaining a tenant.

A movement to have private citizens undertake the solution of the transit problem—entirely apart from the new program adopted by the City Council and transportation companies—was started on June 15, when invitations were sent out to some 40 civic, commercial and educational organizations of Chicago by the City Club asking them to co-operate on the plan. Each group was asked to send two representatives to a conference sponsored by the City Club, who will be willing to devote a large share of their time for the rest of the year to study the various angles of the problem and to devise "a comprehensive, sound and business-like traction program."

The citizen's committee plan is in answer to the suggestion made by certain Aldermen that they would be glad to receive aid and advice in the settlement from public-spirited citizens. The committee will merely propound principles which it feels should be followed.

Illinois Franchise Will Go Over

The St. Louis, Mo., Board of Public Service on June 22 approved the proposed 50-year franchise for the Illinois Terminal System which provides for a subway and elevated system connecting the McKinley Bridge with a new freight and passenger terminal at Twelfth Boulevard and Lucas Avenue. Improvements planned by the McKinley System would cost $5,000,000. The company would have the right to handle carload freight in St. Louis under the new franchise. It is restricted to package freight at present. On June 28 the Board of Aldermen voted to recommit the bill. This delays action on the measure until the fall as the Aldermen start on vacations June 30.

Queens Road Wants Six-Cent Fare Continued

General Lincoln C. Andrews, receiver for the New York & Queens County Railway, Long Island City, has applied to the New York Transit Commission for permission to continue to charge a 6-cent fare on the lines of the company. The present permission to charge the extra cent expires on July 1. The company has been charging the extra fare for nearly three years. General Andrews says the extra cent means a difference between operating at a loss and making expenses.

News from Houston

HOUSTON, TEX., June 24, 1928—Houston *Chronicle* today states "after careful survey among metropolitan newswriters here, Hope's new political guide to Washington is awarded first place among political pieces of the month. The prize, a palmetto fan, a pair of slightly used bedroom slippers and a Houston Electric Company street car token will be delivered to Mr. Hope, the author of "Alice in the Delighted States," by A. S. Draper, of the *Herald-Tribune*, and O. O. McIntyre following the convention." — New York *Herald-Tribune*.

Railway Station in New York Off the Air

S. W. Huff, president of the Third Avenue Railway, New York, has informed Radio Commissioner Caldwell that Station WEBJ, belonging to that railway, is "prepared voluntarily to discontinue operation."

This station is relinquishing its broadcasting license to aid the Radio Commission to clear the air, and was not one of the 162 stations ordered off the air in the New York zone.

Mr. Huff wrote that the station was established for broadcasting safety campaigns, the relations between the public and the transportation company, relations between the employee and employer, and kindred subjects, along with sufficient entertainment to carry the more serious subjects, that it never entered the advertising field and that it was not operated more than six hours a week. Mr. Huff said:

I may add that we have taken an active part in the scientific work of radio development. Our electrical engineer is chairman of the committee of the American Electric Railway Association for the study of radio interference and we have been making a number of investigations to determine the causes and possible remedies of interferences derived from street railway currents, and we shall continue this research work, although we are no longer in the broadcasting field.

Commissioner Caldwell has expressed to Mr. Huff the appreciation of the Radio Board for his "public spirited action." Mr. Caldwell's letter concludes:

Your willingness to adopt the course indicated certainly deserves the commendation of the local millions of listeners who will benefit. It is to be hoped that this fine and unselfish example of your company will be voluntarily followed by other broadcasters in the metropolitan area, to the end of helping the commission solve its difficult problem of clearing the ether channels for good radio this fall and winter.

San Francisco Casts Longing Eyes at Private Road

The public utilities committee and the finance committee of the Board of Supervisors of San Francisco, Cal., on June 20 considered the expiring franchises of the Market Street Railway and instructed City Attorney O'Toole to file suit at once to establish the date of expiration, the city contending it is September, 1929, and the railway contending it is 1932. Mr. O'Toole has also been asked to report what legislation is needed for the city to take over the Market Street Railway system.

According to Mr. O'Toole three things are necessary: placing valuation on the properties of the Market Street Railway, studying the elimination of Market Street Railway lines, and having a conference with California Cable Car Company officials on properties to take over. The city attorney was authorized to go ahead with his work in this connection, for which a $30,000 budget has been appropriated.

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Foreign News

Japan Opens Subway

First city in Orient to resort to underground system for traffic solution

WITH the opening of the first link of an underground subway system to the public in December, 1927, Tokyo, Japan, is the first city of the Orient to adopt the subway as a means of solving traffic problems. The enthusiasm of the populace over the inauguration of what was to them a most novel scheme of travel was so great that close to 100,000 passengers crowded the trains and stations on the opening day, and many rode repeatedly back and forth.

The new subway, which is about 1½ miles long with two intermediate stations, connects two thickly populated sections of Tokyo for which surface lines had become inadequate, the terminals being at Uyeno and Asakusa, popular pleasure resorts. In their construction and equipment, the engineering features and general appearance are very similar to those of the subways of New York City. The excavation was open cut, roofed over with steel. It is of rectangular section and is located comparatively near the surface. The stations, even to the set spaces for advertising on the walls, are like those of New York City, and similar automatic turnstiles are used. The fare is 10 sen (4.6 cents). The possibility of earthquake disturbance received due consideration in the planning, and extra precautions were taken.

The subway was built by the privately owned Tokyo Underground Railway. The second part of the system, consisting of 1.3 miles between Uyeno and Manseibashi Stations, is now under way and will be open for traffic in about a year. The cost of the latter section will be about 3,000,000 yen ($1,300,000), or less than two-thirds of the cost per mile for the first section, owing to more favorable terrain and as a result of the experience gained in the construction of the first section. When the other sections under contemplation are finished the entire city will be traversed and traffic will be facilitated between the outskirts and the business center of Tokyo.

The tunnel is 12 ft. high from the rails, 24 ft. wide, increasing to 36 ft. at the stations. It is double tracked with 100-lb. rails, 4 ft. 8½ in. gage.

Ten all-steel cars make up the initial rolling stock. These were built in Nagoya by the Nippon Sharyo Kaisha and their motors and control equipment were made by the General Electric Company. Each of the cars has two 120-hp. motors, and the maximum speed is 35 m.p.h., the schedule speed being 15½ m.p.h. Lighting equipment and accessories were furnished by the Tokyo Electric Company. The seats are longitudinal, and for standing passengers there are enameled metal hand loops overhead which swing away from the center of the aisle when not in use. Each car accommodates 40 seated passengers and 80 standing.

Two 1,000-kw. rotary converters in the substation supply the 600-volt direct current. The transformers were supplied by the Shibaura Engineering Works. To insure continuous operation the substation is provided with two different sources of power supply and the lighting and signal equipments have three sources of supply.

New Rolling Stock for London Underground Railways

Contracts have been placed for the following new equipment for the London Underground Railway companies, London, England:

For the Metropolitan District Railway, 101 car bodies, 184 trucks, 538 traction motors, and 263 control equipments.

For the Charing Cross & Hampstead and the City & South London Railways, 112 cars, 224 trucks, 128 traction motors, 127 control equipments, and 170 car bodies.

For the Baker Street & Waterloo Railway, 162 cars, 116 traction motors, and 57 control equipments.

Beside the above, 136 car bodies, 612 bogies, and 266 traction motors have been ordered conjointly for the Charing Cross & Hampstead, the City & South London, and the Great Northern & Piccadilly Railways, and 67 control equipments for the last-mentioned line.

With the exception of the 112 cars for the Hampstead line, the whole of the above will replace old cars now in service. It is hoped to have a large proportion of the new equipment in service by the end of this year, and the remainder early in 1929. All the orders have been placed with British firms. The new cars will be fitted with air-operated doors, in place of the gate system.

London Season Ticket Arrangements

To simplify purchase of season tickets on the London Underground Railways, London, England, the companies have decided that all season tickets will be issued from the station booking offices beginning July 1, just as are ordinary tickets. It will no longer be necessary for the passenger to call at appointed season ticket offices or to await tickets at their home stations sent from those offices. There has recently been a remarkable growth in the number of season tickets issued, and it is expected that the new arrangement will lead to further increase.

Bow Trolley Experiments

In Great Britain practically no use has been made of the bow collector for tramcars, the ordinary wheel trolley being in general service. On the continent of Europe the bow is better known. Two leading British municipal tramway authorities now intend to try it out. Birmingham is equipping 50 cars with the bow, and Glasgow is about to experiment on a somewhat smaller scale.

Spanish Railways Contemplate Electrification

Electrification of certain mountain sections of the Spanish railways and part of the Catalan system where traffic is intense, amounting in all to 1,200 miles, is now under consideration by a committee in Madrid, Spain. The committee expects to make its report within three months. The Minister of Public Works has set aside 300,000,000 pesetas (approximately $50,000,000) for electrification, in the extraordinary budget of national reorganization.

The sections to be electrified are about 350 miles in the Norte system, and a somewhat shorter mileage in the Madrid-Alicante system. The latter sections are in the Pyrenees and in Catalonia.

Success of the electrification of the Pajares Tunnel, which includes very steep gradients, has encouraged the Spanish railway companies, although it is not expected that the substitution of electric traction for steam will prove equally advantageous everywhere in Spain. This is what the committee has to determine, and its task is difficult owing to the lack of comparable statistics.

Successful electrification in Spain is largely linked with the creation of a power belt around the whole country. This great work is being considered by the Ministry of Labor, which is collecting data and inviting technical proposals. It is stated that two American concerns are among the firms which through Spanish associates are undertaking to advise the Ministry. This power belt would tap water power or the so-called "white coal" in the Pyrenees and Cantabrian mountains and on the Ebro, Duero (as arranged in the recent Hispano-Portuguese agreement), Tagus and Guadalquivir and, finally, the brown coal deposits in the Teruel region.

Pending the fulfillment of the more elaborate program, it seems certain that the Spanish railways will continue to electrify such sections as may be feasible.

Improvement on German State Line

Single-phase motor-car service has been begun by the German State Railway system between Leipzig and Halle and between Leipzig and Magdeburg, 23 and 77 miles apart, respectively. The service is for local passengers, and is given by two-car trains. The through trains are hauled by electric locomotives.

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Recent Bus Developments

Increased Fare Sought on Washington Suburban Line

An appeal for relief in the form of a 10-cent cash fare, or three tickets for 25 cents for the bus line operating on Bladensburg Road, between Fifteenth and H Streets Northeast, Washington, D. C., and Laurel, Md., has been made to the Public Utilities Commission by William F. Ham, president of the Washington Railway & Electric Company. The new schedule contemplates the issuance of free transfers between the buses and the cars on the payment of a 10-cent cash fare. Ticket users would be required to pay 2 cents additional for a transfer.

The existing rates of fare on the Bladensburg bus line are the same as those on the car lines of the railway. Free transfers are issued between the buses and the street cars at Fifteenth and H Streets Northeast under a five-year agreement between the commission and the company, which expired on April 11.

Mr. Ham's plea for a higher bus fare was made at a public hearing called specifically by the commission to determine whether the transfer arrangement contained in the five-year agreement should be disturbed. He declared that the bus line suffered a loss of $44,511 in the five-year period, beginning April 11, 1923, when buses were substituted for rail service on Bladensburg Road.

Bus Line Rearrangements Look to Unification

What is believed to be a long step toward the ultimate unification of all methods of local transportation in Cincinnati, Ohio, was announced on June 22 by E. D. Gilman, public utilities director, in the transfer by purchase of a number of bus lines, in the securing of one independent competitor by the Cincinnati Street Railway and in the effacement of one company from the field. This result is a partial accomplishment of a plan set up in the Beeler report, urged by C. O. Sherrill, City Manager, and other officials for co-ordination that will include later operation of the municipal rapid transit system.

The transfers of bus properties are expected to avoid destructive competition and to provide a better distribution of lines serving sparsely settled territory. The Cincinnati Street Railway is to purchase the Cincinnati, Hamilton & Dayton Traction Company's bus connection from the Blue Bus Company, a connection operated from Government Square, in the heart of the city, to the interurban traction terminal on Spring Grove Avenue, a distance of about 6 miles. The Mount Airy line, serving a sparsely settled community, operated by the Cincinnati Street Railway, is to be taken over by the City Transit Company, an independent. City Transit will also obtain from the Blue Bus Company five other lines feeding suburbs. All changes are to be effective July 1.

In commenting on the changes, Walter A. Draper, president of the Cincinnati Street Railway, said:

The rearrangement of certain bus lines is a step in the direction of unification of operations. I have several times expressed the opinion that while complete unification is logical and ultimately desirable, the time had not been reached when this should be brought about, because, in my opinion, it can be accomplished gradually at less cost to the railway system (which is the car-riding public of Cincinnati) than if it were done immediately.

The Beeler report recommends such unification as one of the necessary steps in connection with the operation of the Rapid Transit line. The changes secured by the city are all in this direction and will materially help the whole transportation system. It is a practical recognition of the soundness of the theory of unified operation.

Detroit Buses Run at Loss

Expert Mayo assigns cause to pioneering nature of lines. Suggests bids for 50 vehicles be rejected and new proposals called for 67 40-passenger autos

WITH administrative and overhead costs of the Detroit Department of Street Railways properly allocated between the rail and the coach lines the loss for the motor bus division for the year 1927 was $260,492. This is shown in a report submitted to members of the Street Railway Commission by William B. Mayo, advisory engineer for the D. S. R.

The report was prepared for the commission as the result of a survey of bus operating and bus accounting systems, ordered by Mayor Lodge and the commission on March 12, 1928, at a session of the commission at which Commissioners Gorman and Barlum questioned the correctness of figures on the cost of bus operation in the monthly report of William M. Hauser, then auditor of the D.S.R. Mr. Gorman said that Mr. Hauser's figures for cost of bus operation for February, 1928, given as 25.12 cents a mile were too low and that the real figure was nearer 34 cents a bus-mile. Mr. Barlum pointed out, however, that since many of the department's motor coach lines are pioneering into new and undeveloped territory they are not expected to show a profit.

In his survey of motor coach operations Mr. Mayo was assisted by H. M. Gould, former assistant general manager of the D.S.R. Mr. Mayo is chief engineer of the Ford Motor Company and is a former general manager of the D.S.R.

The occasion for the desire for verification of figures of bus operation arose in connection with the consideration of bids submitted to the department on Feb. 23 for furnishing 25 to 50 new buses. In his recent report Mr. Mayo recommends that the former bids be rejected and that "for reasons of economy in operation," sixty-seven 40-passenger street car type coaches be purchased for use as follows: on the Plymouth line, eight; Ford-McGraw line, eleven; Livernois line, twenty-two; Conant line, seventeen; and for spares, nine.

It is further cited that by rejecting the bids now under consideration, a more careful consideration will be permitted of the specifications under which additional equipment is to be purchased, "a reasonable stipulation in the light of recent developments in coach construction."

The report states that the success of the bus enterprise is premised on a knowledge and proper application of production costs.

Sections of the report are quoted as follows:

Because of the distribution of population in the outlying sections of the city, some of the D.S.R. coach lines are of a pioneering nature and will continue to be so for some time, and any default accruing from such operations must necessarily be offset by a profit from coach lines in more settled districts or else from the rail lines.

There is nothing new in a situation of this kind as the same condition exists in respect to rail lines serving sparsely settled districts not only in Detroit but elsewhere. Business principles dictate that the number and amount of pioneering lines should be kept to a minimum, unless some form of subsidy is forthcoming, such as a direct contribution from the party or parties desiring the operation of such lines, or an indirect subsidy in the form of a general fare increase.

That D.S.R. motor coach operations comprise about 20 per cent of the department's activities is set forth, and it is stated that it might properly be expected that the former would bear a proportion of the interest, sinking fund and managerial charges, which is not now the case.

$260,492 Bus Loss

It is in the setting of these proportionate costs against bus operation in 1927 that the Mayo report shows a loss of $260,492, for the year in the motor bus division, whereas the department's financial statement for the year ending Dec. 31, 1927, shows "there is an inferred profit amounting to $231,656 from coach operation. Mr. Mayo says:

Not only should the proper allocation of costs be made between the rail lines and the coach lines, but it should be determined which lines are paying their way and which are not. This refers to both the rail and coach lines, but more especially to the

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latter, as they are used to a great extent in a pioneering type of service with a tendency for such use to increase because of a shifting in population to the outlying districts.

In referring to individual lines the report states that by allocating proportionate costs for insurance, interest, sinking fund, etc., the Chalmers line actually operated at a loss of $17,190 and similarly the Livernois line showed a deficit of $14,768 rather than a net profit of $19,893. The Chalmers line, as shown in the department's financial statement, showed a profit of $50,127.

In regard to the uses to which various types of coaches might be put the report says:

The 21-passenger coach has a definite use in sparsely settled territory and also in some thickly settled territory where frequent headway is necessary or desirable. The 29-passenger coach is the logical vehicle where the 21-passenger coach does not give the requisite capacity, while the 40-passenger and the 61-passenger coaches are admittedly for use where the loading is concentrated. For the economical use of vehicles continuous research should be made of population, traffic and transportation trends.

Mr. Mayo recommends that the Jefferson Avenue express service, now running between St Antoine Street and Lillibridge Avenue be extended easterly 2 miles to the city limits and that after a suitable trial period a plebiscite be taken to ascertain the opinion of the riders. Here the report says:

If it is found that the cost of such service is greater than street car service alone, the plebiscite might also be employed to ascertain the reaction of an increase in the fare to cover the extra cost of a faster service.

The shifting of population to the outlying districts warrants a faster service than that given by anv vehicle stopping five to eight times per mile, and a faster service if it costs more, warrants a higher rate of return.

Figures are available which show that the per capita riding of mass transportation vehicles is decreasing, thereby making it necessary to employ means other than those used in the past if such vehicles are to retain their position in the transportation field.

Schedule changes, the elimination of certain outlying coach lines, or their amalgamation with other lines are contained in the engineers' suggestions and recommendations in the report cover shop and garage services, time keeping and material issuing methods, with recommendations for cutting costs and eliminating duplication of effort.

Trial Operation on St. Joseph Line in Prospect

Motor coaches will be operated parallel to the Grand Avenue car line of the St. Joseph Railway, Light, Heat & Power Company, St. Joseph, Mo., starting about July 1, according to Fred E. Henderson, superintendent of the railway department. A permit to operate the coaches for 60 days was asked by the company and granted by the City Council, and the company is now awaiting the arrival of the new equipment. Three coaches will be operated at the regular street car fare, with transfers acceptable on all street car lines except Grand Avenue.

Extension of New Jersey Bus Service

The Port Authority of New York announced on June 27 that the two new bridges between Staten Island and New Jersey would be opened officially for traffic at 5 a.m. the following day.

At the same time the Public Service Interstate Transportation Company announced that it would operate bus lines between St. George and Elizabethport and Perth Amboy over the new bridges beginning June 29.

By acquiring the crosstown service and the Paterson-Lodi bus lines the Public Service Co-ordinated Transport now controls every passenger bus operating wholly within Paterson. Both of these companies are affiliated with the Public Service Corporation of New Jersey.

Competitive Rights Sought

Chicago Motor Coach Company's petitions for 100 miles of new routes being heard by Illinois Utility Commission

PLANS for a major expansion of the lines of the Chicago Motor Coach Company to cover approximately 100 additional miles on 40 streets in all sections of the city of Chicago are involved in hearings now being conducted by the Illinois Commerce Commission in Chicago.

Three petitions for certificates of convenience and necessity, one each for west, north and south side extensions, are being heard one by one in a series that is expected to extend through most of the summer. With its present 145 miles of route mileage, the Chicago Motor Coach company would, in case the applications are granted, operate a total of 245 route-miles. The motor coach company operates 456 single and double-deck buses at present and is adding to its fleet each month.

The Chicago Surface Lines and several city Aldermen have been attempting to obtain permission from the commission to operate buses on many of the same street as a part of, and in supplement to, the surface lines system with a 7-cent fare and free transfers to connecting car lines.

In a similar project contemplating bus service on Addison Street between Sheridan Road and the west city limits, for which privilege both the motor coach and surface lines companies had applied, the commerce commission last month granted the petition of the bus company.

The legality of the right of the Illinois Commerce Commission to empower bus lines to operate in Chicago streets without a franchise has been pending in the Illinois Supreme Court for more than two years.

Bus Extension Planned by East St. Louis Company

The East St. Louis & Suburban Railway filed with the Illinois Commerce Commission at Springfield, Ill., on June 21, three applications for permission to abandon electric railway service in St. Clair and Madison Counties and substitute buses. The company would abandon electric railway service from the northern city limits of Collinsville to Edwardsville; through service from Collinsville to Edgemont, and all passenger service from St. Louis and East St. Louis to O'Fallon and Lebanon, Ill., via Edgemont and French Village. It has also asked the right to take up its tracks between Collinsville and Edwardsville from French Village to Long's Junction, on the outskirts of Collinsville, and from Lebanon to O'Fallon.

Simultaneous with these applications the Blue Goose Motor Company, Inc., the bus subsidiary of the railway, filed requests to operate bus service from Collinsville to Edwardsville, from Edgemont to Collinsville and the Eads Bridge station in St. Louis, Mo., through East St. Louis via Eighth Street, St. Clair Avenue and Illinois Highway No. 12 to French Village, O'Fallon and Lebanon, Ill. This company now operates a de luxe motor coach service from the Eads Bridge station to Belleville, Alton and Vandalia, Ill.

Hollywood Board Wins on Improved Services

A petition of the Hollywood, Cal., Chamber of Commerce for a permit to operate a crosstown bus service in Hollywood, Cal., was denied by the Board of Public Utilities on June 19. The board did grant permits, however, for crosstown extensions totaling 6 miles, to the Los Angeles Railway and Pacific Electric Railway motor coach divisions with the approval of the Hollywood Chamber of Commerce.

North Shore Feeder System Transferred to Subsidiary

The Metropolitan Motor Coach Company will, on July 1, take over the extensive motor coach service of the Chicago, North Shore & Milwaukee Railroad. In the official announcement on June 26 Fred A. Klock, general manager of the Metropolitan system, said: "We will continue to operate coaches over established routes on regular schedules as cross-country feeders to North Shore Line trains. Bringing the bus lines under a centralized management, however, will permit of more efficient operation such as should be of great benefit to motor coach patrons."

Service of the Metropolitan Motor Coach Company has been restricted in the past to the operation of coaches on limited schedules between the Chicago Loop and downtown Milwaukee. Upon taking over the North Shore

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Line's bus facilities it will extend its operations over twelve routes connecting North Shore communities with principal resorts in the northern Illinois and southern Wisconsin lake regions and important communities to the west of the rail lines. The Metropolitan Motor Coach Company operates the popularly known "Marigold Coaches." All the coaches of the Metropolitan system are painted goldenrod with green trim and bear the monogram reading "Marigold Coaches—Metropolitan System."

Other companies included in this network of motor coach lines serving communities throughout the Chicago metropolitan area are: The Western Motor Coach Company, operating coaches between Chicago and western suburbs in the Fox River Valley; the Niles Center Transit Company, furnishing service between Chicago and suburban points to the northwest; the Northwestern Transit Company, operating local bus service in Oak Park, Ill., and the Evanston Bus Company, furnishing local coach service in Evanston, Ill. The new Union Bus Depot, at Roosevelt Road and Wabash Avenue in the downtown section of Chicago, is the main terminal for all coaches of the Metropolitan system operating in and out of Chicago.

Service Between Joliet and Chicago Arranged

The Chicago & Joliet Transportation Company, the Illinois Traction System and the Alton Transportation Company, the first and the last bus subsidiaries of electric railways, have been granted certificates of convenience and necessity for the operation of bus routes which will hook up a Chicago-St. Louis through schedule and are believed to be a forerunner of the granting of one certificate, covering the entire route, to one of the companies, as soon as satisfactory schedules and agreements are worked out among the three transportation concerns.

The Chicago & Joliet will run between Chicago and Joliet, the Alton Transportation between Joliet and Carlinville and the Illinois Traction System from Carlinville to St. Louis. The franchised companies plan to establish from two to four buses each way daily within the next 60 days with more frequent trips between the Joliet and the Chicago terminals.

Substitution in Prospect in Lincoln

A. H. Cuppley, manager of the University Transit Corporation, Champaign, Ill., was in conference with Lincoln, Ill., city officials recently and as a result it is likely that bus service will be installed, probably by July 1. The bus lines will supplant the railway service, suspended on May 15. Bids will be received by the city on July 23, for junking the cars, tracks and all other equipment.

Financial and Corporate

Three Class "A" Massachusetts Roads

The Springfield Street Railway, Springfield, Mass., is one of three electric railways in the state whose securities are listed by the Department of Public Utilities as legal investments at this time for Massachusetts savings banks. The other two are the Boston Elevated Railway and the Union Street Railway, New Bedford.

Capper of Kansas Seeks Help on Washington Merger

Senator Capper, chairman of the Senate Committee on the District of Columbia, in a letter to the Bureau of Efficiency on June 22, requested that the bureau make a study of the plan now under consideration for the merger of the street railways of the District of Columbia. Mr. Capper said in part:

"I should be glad, if, during the recess of Congress, your bureau could study the railway merger problem in Washington, as presented for the consideration of our committee in the proposed unification agreement and joint resolution. I leave to your own discretion the amount and character of your study of this matter.

"The sub-committee of which I am chairman, under authority of a Senate resolution, is authorized to expend not exceeding $10,000 for expert assistance, and we have engaged Dr. Milo R. Maltbie, to assist us. There is no reason, however, why we should not have the benefit of an independent investigation conducted by your bureau, if you are willing to undertake a study of the problem and have available whatever assistance may be needed.

"I leave to your judgment the form and plan of your investigation, as well as its scope, but the full committee and the Senate, as well, would be better able to deal with the problem of the merger if equipped with information on these subjects:

1. Fair value, for rate-making purposes, of the properties to be merged.

2. Physical condition of the properties, including equipment.

3. Condition of income and profit accounts of the carriers (whether accurately and uniformly kept in accordance with standard practice.)

4. Present depreciation reserves and provisions for reserve after merger.

5. Comparison of rates of fares in other cities.

6. Comparison of operating costs ratio in Washington and elsewhere.

7. Comparison of fixed costs ratio and general administration expense in Washington and elsewhere.

8. Comparison of power cost to street railways now and after merger. Practice of railways in other cities as to purchase or manufacture of power.

9. Possible economies through merged operation.

10. Car-miles operated per revenue passenger here and elsewhere (to determine possible economies in routing, etc.).

11. Future of bus relationship to railway operation, and particularly, question of transfer charges.

"I should like to have your comments, in due time, upon any features of the proposed merger agreement that you care to discuss after investigation. If, your study of the situation convinces you that the merger proposal is the best possible under the circumstances, I shall be glad to have your reasons for that opinion."

Conferences Look to Ontario Acquisition

Negotiations are under way looking to the acquisition of the Windsor, Essex & Lake Shore Railway, a 36-mile railway extending from Windsor to Leamington, Ont., Canada, by the municipalities and its operation on their behalf by the Hydro-Electric Power Commission.

J. F. Collins Receiver as Part of Readjustment Plan

John F. Collins, vice-president and general manager, has been named receiver of the Michigan Electric Railway, operating city lines in Lansing, Battle Creek, Kalamazoo and Jackson and interurban lines between these cities, and to Owosso and St. Johns, by U. S. District Judge Charles S. Simons in Detroit. The move is a forerunner of a general reorganization of the company, to be negotiated at an early date.

The appointment of Mr. Collins as receiver marks the third post that he is occupying for Michigan electric lines in that capacity, he having been named receiver for the Detroit, Jackson & Chicago Railway and the Michigan Railroad some time ago.

Mr. Collins was also acting for the Michigan United Railways, when it was reorganized into the Michigan Electric Railway in 1923.

Lack of business, due to competition of the automobile and buses over concrete highways is ascribed as the reason for the inability of the Michigan Electric to pay its bond interest since Jan. 1, 1925. To date the accrued interest amounts to $1,550,000.

When the Michigan United Railways went into the hands of a receiver in 1920, a similar condition existed, and in 1923, when a reorganization was effected, bondholders agreed to accept 50 cents on the dollar. Approximately 255 miles of electric railway lines are

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operated by it, having an appraised value of $15,000,000.

The receivership, according to Mr. Collins, will bring no immediate changes in the personnel of the road, and business will be carried on as usual, both in Jackson and in other cities where the lines touch.

Meanwhile the company will continue its efforts to secure franchises to operate trucks and buses on highways paralleling its lines, Mr. Collins announced. Hearings on this subject have already been held before the State Utilities Commission, and a ruling is expected to come within a few weeks.

The Michigan Electric Railway, if it is given franchises on state highways, would operate a store to door system, used its facilities to carry on the work. Whether interurban or city street car lines would be abandoned in the event the motor freight franchise would be granted, would depend on its future income from these sources, officials of the company have declared.

Wants Municipal Road Out of Politics

Superintendent of San Francisco system sees this as immediate need. Confidence of public in system shaken. Condemns construction of extensions for purposes of political expediency

NO ACTION has been taken on the report made by Superintendent Boeken of the San Francisco Municipal Railway, San Francisco, Cal., to the Board of Public Works on the future financial outlook for the system. It will be recalled that Mr. Boeken said that it must be plain that in order to remove the railway, as well as other public utilities, as far as possible from political control and influence, it is imperative that a non-political public utility commission be created and be intrusted with the future destinies of all of San Francisco's public utilities.

Twice has Mr. Boeken been called before meetings by the Mayor and the Supervisors and cross-examined, but he has stuck to his guns. The superintendent submitted his report with the hope that it "will bring clearly to the mind of everyone just what the railway has done, is doing and will be able to do in the future on a 5-cent fare if a proper policy is adopted." He is confident that "if the recommendations and suggestions are carried out there need be no cause for alarm as to the future financial welfare of the railway in so far as it is now developed." He says in conclusion:

It is unfortunate that the confidence of the public in those intrusted with the welfare of the Municipal Railway has been shaken, at least to a certain extent, as evidenced by the defeat of the proposed bond issues for extensions last year.

The yielding to unreasonable requests for extensions, increased service, etc., which resulted in using up large sums of money from the reserve funds, requests that in some instances had very little merit and deserved very little consideration and which did not have the unqualified indorsement of those competent to pass upon such matters, is no doubt largely responsible for this loss of confidence.

It is vitally important that anything hinting of politics be removed from the future policies and operation of the Municipal Railway, to the end that public confidence shall be fully restored.

Of the ability of the system to expand he says:

There is no doubt but that the ability of the system to pioneer and develop new districts, furnish through service to those districts long before the revenue received warranted the same, all on a 5-cent fare and without any additional financing therefor (moneys being taken from reserve funds to buy new equipment, lay new tracks, start bus lines, etc.), has been overrated, and with the completion of the Judah Street line the moneys in the old depreciation fund will be practically exhausted.

These expenditures helped to develop certain districts and added to the assessment roll of the city, but the increase in revenue to the Municipal Railway was in no way in keeping with the increased cost of operation.

The loss in the operation of buses causes operating deficits which make serious inroads on the reserve funds and call for grave consideration. Mr. Boeken says:

While the Municipal Railway's ability to do all these things on a 5-cent fare has been marveled at, it would have been wiser had a different policy of financing been pursued, to the end that the reserves for depreciation, etc., had been kept to a healthy level, thereby saving the necessity of undoing some of these acts.

The total bonds issued for the railway was $5,481,000, as against a present road and equipment account of $8,636,839, showing a difference of $3,155,839 spent for additions and betterments, as of June 30, 1927. But the superintendent says:

In the face of the growing ratio of operating expense to revenue the depletion of the reserve funds to an ebb so low was not wise and some other method of financing some of these extensions should have been followed. If only the extensions indorsed by those qualified to pass on such matters are submitted to the people at a bond election they will receive the hearty support of the voters.

RATIO OF OPERATING EXPENSE TO REVENUE, IN PER CENT

1918	1919	1920	1921	1922
59⅛	69¼	75	73⅜	74⅜
1923	1924	1925	1926	1927
77	77⅜	78	79⅜	84¾

A statement of funded debt was offered to show what the Municipal Railway has done in the way of paying off the original debt. Almost half of the bonds have been retired, and the balance is being paid off at the rate of $200,000 a year. The report says:

It will not be possible, nor does it seem fair, in view of the present high cost of operation, to expect the Municipal Railway to be able, out of receipts, to set aside 3 per cent of the total cost of the road and equipment, amounting to more than $250,000 a year, as provided for by Ordinance No. 7060, May 1, 1926, for replacement, reconstruction and depreciation, and at the same time pay off the original debt of the system to the extent of $200,000 a year.

The result of operation for the calendar year 1927 indicates that about $140,000 would have been all that could have been placed in the depreciation fund had there been no other funds available to meet the bond redemption payments. Due to the fact that reserves, in so far as the old depreciation fund is concerned, will be practically all used up in the completion of the Judah Street Line, it will be necessary to look to the present depreciation fund for relief in meeting the semi-annual bond redemption payments. Mr. Boeken then says:

With certain savings to be made, as recommended in this report, and with a gradual increase in receipts, as indicated, of more than 2 per cent since November, 1927, it should be possible without resorting to any drastic measures in the way of service reduction (which I believe would

STATEMENT OF FUNDED DEBT AT SAN FRANCISCO

	Issue	Total Issued	Annual Maturity	Interest Rate Per Cent	Final Redemption	Unmatured	Retired
Geary Street	1910	$1,900,000	$95,000	4½	July 1, 1934	$665,000	$1,235,000
Market Street	1910	81,000	3,000 and 6,000	4½	July 1, 1934	30,000	51,000
Municipal Railway	1913	3,500,000	100,000	5	Dec. 1, 1952	2,500,000	1,000,000
Totals		$5,481,000	$198,000 and 201,000			$3,195,000	$2,286,000

Note—Geary Street and Market Street redemption date is July 1 of each year.
Municipal Railway redemption date is December of each year.

OBLIGATIONS TO BE MET

Bond redemption, July 1, 1928	$96,000
Bond interest (Municipal Railway bonds) June 1, 1928	62,500
Bond interest (Geary Street and Market Street bonds), July 1, 1928	15,637
Market Street Railway account, Crossing Litigation	32,000
Total obligations	$206,137

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AVAILABLE RESOURCES AT SAN FRANCISCO

Cash balance, Municipal Railway operative fund, Jan. 31, 1928	$61,943
Accrued interest on securities owned	12,089
Due account West Portal Avenue	2,715
Due from Harbor Commission	8,228
Estimated subsidy from Harbor Commission on, five months at $475 (Feb. 1 to July 1, 1928)	2,375
Estimated income from operations, February to July, 1928	*25,045
Total resources	$112,397
Estimated deficit	$93,739
In addition to the resources listed above, there are Accounts Receivable as follows:	
Due from general fund account Twin Peaks Tunnel	$32,152
Due from general fund account Stockton Street Tunnel	48,971
Due from general fund account Ocean Shore Switching	1,000
Total accounts receivable	$82,123
Unencumbered balance accident reserve fund, Jan. 31, 1928	$109,856
Unencumbered balance depreciation reserve fund, Jan. 31, 1928	378,781
Unencumbered balance depreciation fund Jan. 31, 1928	51,547
	$540,186

NOTE:—The construction of a garage, estimated at $50,000, including land, is considered very necessary for the housing and repairing of buses.

* For the seven months ending Jan. 31, 1928, operating revenue showed an increase of $37,377.78, or 1.8938 per cent. During the same period operating expenses increased $88,721.63, or 5.3153 per cent. Assuming the same ratios of increase in revenues and expenses for the remaining five months of the fiscal year will leave a net income of $25,045.97, after deducting $107,960.50 for Depreciation reserve and $36,250 for Accident reserve.

be unwise) materially to build up the depreciation fund, at least to a greater extent than was done last year. Any deficits in the future might well be considered as "Deferred Depreciation Liabilities" to be repaid as soon as the annual bond redemption payments are reduced, which will be in 1934.

A very clear idea of the state of Municipal Railway finances, as of Jan. 31, 1928, since operating under the provisions of Ordinance No. 7060 of the Board of Supervisors, effective May 1, 1926, is conveyed in the accompanying statement of obligations to be met.

INCREASE IN RECEIPTS FOR PAST FIVE YEARS

Calendar Year	Receipts	Increase Over Previous Year	
		Amount	Per Cent
1922	$2,922,720		
1923	3,077,991	$155,270	5.3125
1924	3,202,252	124,261	4.0371
1925	3,328,099	125,847	3.9300
1926	3,341,940	13,840	.4159
1927	3,355,981	14,041	.4202

In summing up the car line schedules, it did not appear to Mr. Boeken that any appreciable reduction in service could wisely be made; in fact, while slight reductions might be reasonably made on some lines, the saving would hardly meet the increases properly due other lines. The superintendent said that the excellent record made by the men who operate the cars, good roadbed and perfect condition in which the rolling stock has been maintained have, to a great extent, been responsible for keeping down accidents and made possible the large saving under the amount estimated as necessary.

Since May 1, 1926, 2½ per cent of the gross passenger revenue has been set aside for accident reserves, with $100,000 from the former fund as an initial deposit.

In commenting on the item "Revenue Credits" Mr. Boeken says it is not a proper method to pursue, as no like allowance is made to street car lines for transfers received from bus lines, the result being that bus lines are credited with 7½ cents and the car lines with 2½ cents of each round-trip fare.

A table of bus fare rates charged by the various railways operating buses was introduced to bring out the fact that the Municipal Railway, with a charge of 5 cents with nothing additional for a transfer, is receiving a much lower rate of fare than the average of 8.48 for 245 other comparable installations.

Mr. Boeken said the elimination of transfers between buses and street cars would not create an unreasonable rate of fare, taking into consideration the length of route, etc., and he recommended that these transfer privileges be discontinued.

The estimated increase resulting from the recommendations made in the report approximate $50,000 a year and "will very materially build up our reserve funds." He frowned upon any further reduction of schedules.

Loss on Bamberger Line $6,642

A loss of $6,642 was suffered by the Bamberger Electric Railroad, Salt Lake City, Utah, in 1927. The reports show the operating revenues were $559,229, or $14,118 less than in 1926. Operating expenses were $444,711, or $156 less than in 1926, leaving the net revenue from railway operations at $114,578. This is a sum $13,961 higher than the preceding year. From a gross income of $82,996 the company had total deductions amounting to $89,639.

TOTAL LOSS ALL SAN FRANCISCO MUNICIPAL BUS ROUTES

	Calendar Year 1927	Five Years
Receipts	$98,144	$269,825
Mileage	691,814	2,194,720
Number of passengers (cash)	1,962,401	5,397,801
Number of transfers	977,039	3,334,115
Number of quartermaster tickets	300	723
Number of school tickets	55,368	186,458
Loss exclusive of revenue tickets	$108,679	$279,524
Loss including revenue credits	82,853	191,469
Operating cost per mile	.29896	.25031
Operating revenue per mile, including revenue credits*	.17920	.16307
Operating revenue per mile exclusive of revenue credits	.14187	.12294

* The item "Revenue Credits" consists almost wholly of an allowance of 2½ cents for each transfer received on buses from street cars.

Receiver Likely for Auburn & Syracuse Road

T. C. Cherry, president of the Auburn & Syracuse Electric Railroad, Syracuse, N. Y., is slated for appointment as receiver of the company. More than a year ago the company defaulted in the payment of the interest on its bonds. Since then a protective committee representing the bondholders has been at work securing pledges of the bonds. That committee now has about finished its task. Mr. Cherry is receiver of the Empire State Railroad. Recent moves in connection with both of these companies presage their probable early reorganization.

$155,344 Deficit in Indianapolis

Total net earnings of the Indianapolis Street Railway, Indianapolis, Ind., less taxes for the year ended Dec. 31, 1927, were $940,770. From this figure $639,914 was subtracted for interest deductions, leaving a surplus exclusive of accrued depreciation of $300,855. After the consideration of deductions from this surplus the balance was a deficit of $155,344. These figures were disclosed in the annual report of the company and presented at the annual meeting of the stockholders June 13, 1928.

EARNINGS AND OPERATING EXPENSES OF THE INDIANAPOLIS STREET RAILWAY

	1927	1926
Earnings		
Passenger receipts—City lines	$4,313,446	$4,425,529
Transfer receipts—City lines	293,938	310,866
Miscellaneous earnings—Track rentals	807,285	782,398
Gross earnings	$5,414,670	$5,518,794
Operating expenses—		
Maintenance of way and structures	$588,132	$610,914
Maintenance of equipment	499,122	502,982
Total maintenance	$1,087,255	$1,113,896
Operation of power plant and substation	$760,689	$756,813
Operation of cars and buses	1,911,591	2,028,500
General expenses	418,440	444,135
Total operating expenses	$4,177,976	$4,343,346
Net earnings	$1,236,693	$1,175,447
Less taxes	295,923	294,872
Net earnings, ess taxes	$940,770	$880,575

On the subject of buses the report says that the company recognized the necessity of a co-ordinated system of street railway and bus transportation in the city of Indianapolis and so through an order of the Public Service Commission acquired the entire capital stock of the People's Motor Coach Company. At the present time 45 buses are being operated by the People's Motor Coach Company and 27 by the Indianapolis Street Railway.

During the year the erection and installation of equipment of five new substations were completed. Many im-

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provements in replacement and renewal work were also effected.

Benefits resulting to employees and their families from the operation of the pension fund and benefit association justified the company's annual contribution of $5,000. During the year 1927 $30,354 was paid to employees and beneficiaries out of these two organizations.

Bonds to Finance Improvements on Indiana Line

Authority to issue $1,000,000 of 25-year 6 per cent first mortgage bonds and to issue 10,000 shares of common stock and sell 100 shares at $100 each was asked in a petition filed with the Indiana Public Service Commission recently by the Indianapolis & Southeastern Railroad. The company recently took over the property of the Indianapolis & Cincinnati Traction Company following its sale under foreclosure. The petition sets out that proceeds from the securities are to be used to consummate the deal and make other purchases and additions, including ten new cars to cost $185,000.

Amendments Sought to Central Public Service Charter

At a meeting to be held on July 9 stockholders of the Central Public Service Corporation, Chicago, Ill., will be asked to approve amendments to the corporation's charter whereby the class A stock will be given full rights of participation with the common stock in both earnings and surplus in liquidation. It is proposed to give the class A stock priority over the common stock to the extent of $1.75 a share annually in earnings and $30 a share in liquidation. In addition the class A stock is to participate equally with the common stock in earnings and surplus in liquidation after the common stock has received an amount equivalent to class A priority. President Pierce said:

The very material increase in the properties of Central Public Service Corporation, combined with the normal growth in the company's business, has made it advisable to augment the present features of the class A stock in a manner to make it attractive to a wider class of investors.

The present limitations with respect to dividends and to surplus in the event of liquidation are such that possibilities of material market appreciation are negligible. Furthermore, the vast number of investors in utility common stocks have not been interested in the Central Public Service class A because of its definite limitation in participating in the future of the properties.

The gross earnings of the corporation are at the rate of $13,500,000 annually at the present time and the balance available for dividends on the preferred, class A, and common stocks is more than $1,800,000, or several times the amount required. The class A stock is currently paying dividends at the rate of $1.75 yearly.

The Central Public Service Corporation recently came into ownership of the Rockford, Portsmouth, Huntington, Roanoke and Lynchburg railways.

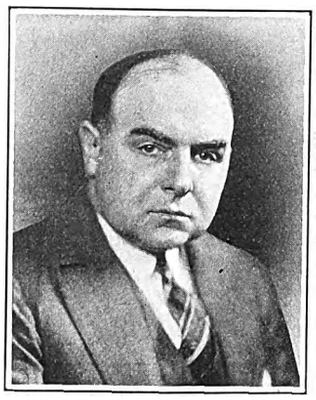
Personal Items

T. A. Kenney Allied Vice-President

Officer of Hodenpyl-Hardy companies and chairman of railway association's finance committee in executive post with new consolidated company

T. A. KENNEY has been elected a vice-president and director of the Allied Power & Light Corporation, New York, formed recently to consolidate the interests of Hodenpyl, Hardy & Company, Inc., and Stevens & Wood, Inc. He was recently made a director of the Commonwealth Power Corporation.

Mr. Kenney's entire business career has been spent in the utility business.



T. A. Kenney

In 1912 he joined the Hodenpyl-Hardy organization in the capacity of manager of the production and transmission department of the Consumers Power Company, with headquarters at Jackson, Mich. That company was then consolidating a great many widely scattered hydro-electric companies in the state and interconnecting them—all of which required further pioneering work. This resulted in the development and successful operation of the first 140,000-volt transmission system. Four years later he came to New York as assistant to B. C. Cobb in charge of operations of the Hodenpyl-Hardy properties, one of the largest public utility groups in the United States.

Mr. Kenney was born in Mechanicsville, N. Y., on Jan. 5, 1882. After he left school, Mr. Kenney entered the employ of the Hudson River Power Transmission Company, which subsequently became a part of the Adirondack Water Power Corporation. This early association, which afforded him experience at first hand with the electrical industry, included not only high voltage power transmission (so-called)—12,000 volts, but local electric distribution, industrial power application and electric railway operation as well.

In addition to his executive duties, Mr. Kenney has been prominently identified with the National Electric Light Association and the American Electric Railway Association activities. He is at present a member of the public policy committee of the National Electric Light Association, and in addition to being a member of the executive committee of the American Electric Railway Association is chairman of the finance committee of that organization.

In addition to his duties with the Commonwealth Power Corporation and the Allied Power & Light Corporation, Mr. Kenney is vice-president of the following companies: The Tennessee Electric Power Company, Northern Ohio Power & Light Company, Consumers Power Company (Michigan) and Nashville Railway & Light Company. He is a member of the board of directors of the Northern Ohio Power & Light Company, Northern Ohio Power Company, Consumers Power Company, Tennessee Electric Power Company, Electric Railway Securities Corporation, Southern Michigan Light & Power Company and Nashville Railway & Light Company.

B. H. Saunders Chairman of North Jersey Commission

Bertram H. Saunders, Paterson, N. J., has been elected chairman of the North Jersey Transit Commission to fill the unexpired term of Daniel A. Garber, Ridgewood, who resigned following his recent appointment as general manager of the Association of General Contractors, with headquarters in Washington. This is a position which has taken Mr. Garber to the Mississippi River territory as a member of a government subcommittee on flood control and has necessitated his continued absence from New Jersey.

Mr. Saunders and Mr. Garber were appointed by Governor Silzer of New Jersey on the original commission set up by the State Legislature in 1922 to study means of improving mass transportation in northern New Jersey. Mr. Saunders served as chairman from 1924 until 1926, and was replaced by Mr. Garber that year.

W. C. Slade Heads New England Street Railway Club

Walter C. Slade, vice-president of the United Electric Railways, Providence, R. I., since 1925, was recently elected president of the New England Street Railway Club at the meeting held in Boston on May 24. Mr. Slade has been identified with the Providence property since September 1915 when he became superintendent of power and lines of the company then known as the Rhode Island Company. Mr. Slade's first position was with the General Electric Company at Pittsfield, Mass. His work

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in Providence has been especially noteworthy for the modernization program affecting the power system which involved an expenditure of slightly more than $2,000,000.

Mr. Slade was born in Providence in 1885 and was graduated from Brown University with the degree of Ph.D. in 1907. Later he was graduated from the Massachusetts Institute of Technology.

As a result of an error in the telegraphic account of the meeting which appeared recently in the JOURNAL it was made to appear that Ralph Bauer, one of the speakers at the meeting, had been elected president.

M. R. BOYLAN, vice-president of Public Service Co-ordinated Transport, Newark, N. J., and Martin Schrieber, manager of plant and equipment of the company, sailed on the *Majestic* on June 22 on a visit to London, Paris and Berlin. They will, so far as the opportunity presents, study co-ordinated transportation in its possible application to the lines of the company of which they are officers. They plan to return to the United States in August.

R. P. Stevens Elected by Commonwealth Power

R. P. Stevens, president of Stevens & Wood, which was recently linked with Hodenpyl, Hardy & Company in the Allied Power & Light Combination, has been elected vice-president, director and member of the executive committee of the Commonwealth Power Corporation, in which the new utility company owns a substantial interest. T. A. Kenney, as noted elsewhere, and H. S. Scarritt, member of Bonbright & Company, have also been elected to the Commonwealth board. They succeed Earl S. Colman, W. M. Flook and Waldo S. Reed.

C. T. DeHore Heads Reorganized Company

Charles T. DeHore and L. E. Eastman, purchasers of the property of the Indianapolis & Cincinnati Traction Company at receivers' sale, are among the organizers and incorporators of the Indianapolis & Southeastern Railroad, the successor company. Mr. DeHore became president and Mr. Eastman vice-president of the new company. Other incorporators were Frederick D. Rose, Muncie, banker; A. M. Miller, Rushville; Miss Theresa Reardon and Donald L. Smith, attorney.

JOHN H. DELANEY, chairman of the Board of Transportation, New York, N. Y., was reappointed to that position for a period of six years on June 23. Mr. Delaney's term did not expire until July 1, 1930, but the term of Commissioner Frank X. Sullivan was about to expire. Commissioner Sullivan was sworn in for the rest of Commissioner Delaney's term.

Luke C. Bradley Leaves Providence

President of Rhode Island Public Service to become connected with Electric Bond & Share Company

LUKE C. BRADLEY, president of the Rhode Island Public Service Company, which some time ago took over the United Electric Railways and the Narragansett Electric Lighting Company, announced on June 23 that he will submit his resignation to the directors of the company at their July meeting. The resignation is to become effective Aug. 1. He will assume an executive position with the Electric Bond & Share Company, New York.

Mr. Bradley's statement announcing his resignation follows in part:

I am resigning to become associated in an executive capacity with the Electric Bond & Share Company of New York City. I am leaving Providence with real regret and only because of the larger opportunity presented to me.

Luke C. Bradley

Above all I regret to sever my connection with the men and women of the United Electric Railways and the Narragansett Electric Company, from whom I have received the fullest co-operation and loyal support.

Early in February, 1927, Mr. Bradley was elected president of the service company, to succeed Louis C. Gerry. Mr. Bradley resigned a similar position with the Virginia Electric & Power Company to accept the Providence offer.

Associated with Stone & Webster, Inc., Boston, in executive positions for many years, Mr. Bradley had varied experience as directing head of utility companies in different parts of the country. As president of the Virginia company, he had direct supervision over electric light and power properties, electric railways, bus systems and gas properties operating in more than 40 cities in the states of Virginia and North Carolina.

Mr. Bradley was also executive vice-president and division manager of utility properties under the management of Stone & Webster in the Southwest serving more than 100 towns and cities. He is recognized as one of the most successful executives in the public utility field.

The Electric Bond & Share Company, with which Mr. Bradley is to be affiliated, supervises probably the largest number of electric light and power companies in the United States.

F. D. Comerford to Succeed Mr. Bradley in Providence

Frank D. Comerford, president of the New England Power Association, will probably be elected to succeed Luke C. Bradley as head of the Rhode Island Public Service Company.

It is learned also that William C. Bell, formerly general manager of the Rhode Island Public Service Company and recently elected vice-president of the power association, which controls the service company, will supervise operations of both the Narragansett Electric Company and the United Electric Railways, which make up the service company. Frank L. Swan, successor to Mr. Bell as general manager of the service company, will continue in that capacity.

No changes are expected in executive positions of either the Narragansett Electric Company or the United Electric Railways.

In addition to heading the parent company, Mr. Comerford is a director of the Public Service Company. He is only 34 years old, and was named last November to succeed Henry I. Harriman as head of the power association, which controls public utilities throughout New England.

Obituary

FREDERICK HUNTINGTON PARKE, a veteran engineer of the Westinghouse Air Brake Company at Wilmerding, Pa., died on June 16. He became connected with the Westinghouse Machine Company at East Pittsburgh, early in his career, remaining with that organization until 1898, when he entered the employ of the Westinghouse Air Brake Company. Soon he was sent to Russia to assist in the construction of the air brake plant at St. Petersburg and in the formation of the engineering organization. He remained in Russia until 1902 when he returned to Pittsburgh. Since then he has been at the Wilmerding works, where at the time of his death he was general engineer. Mr. Parke received his early education at St. John's School in Manlius, N. Y. He was graduated from Cornell University as a mechanical engineer in the class of 1892.

WILLIAM B. JOHNSON, sales representative for Ross F. Hayes, railway supplies, New York, N. Y., died on May 27. Mr. Johnson was 28 years old.

PAUL V. CLODIO, formerly sales manager of the Bragg-Kliesrath Corporation, Long Island City, N. Y., died recently.

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Manufactures and the Markets

$1,000,000 for Montreal Track

Of the principal track jobs being done by the Montreal Tramways, Montreal, Canada, this year, two are for extension of the company's lines farther into the outlying sections. On Delorimier Avenue, the double track is being extended from Rachel to Masson Streets, about 1 mile. On this job the rails will be welded instead of using plates.

The other extension into new territory is on Van Horne Avenue. Double tracks on this street will be extended for approximately 1½ miles, from Hartland Avenue, the present terminus of that line, to Cote des Neiges Road.

Two important city jobs are: On St. Denis Street, between Craig and St. Catherine Streets, where new tracks are being substituted for old, the job being about half accomplished at this date; and on Craig Street, from St. Denis to Papineau Streets, where the tracks also are being renewed. In addition there are quite a number of minor jobs, including a few intersections.

One million dollars is being spent by the company on this work during the present year, which is an average appropriation for the construction and reconstruction activity of the company for one year.

D. S. R. Track Improvements Finished This Year

Approximately $1,000,000 is to be expended during this summer on track rehabilitation by the Detroit Street Railway, Detroit, Mich. This will make the system modern as far as tracks are concerned.

The new rails, ties and pavement laid last year on Woodward Avenue from the Boulevard to Philadelphia Avenue, will be extended north several blocks this year, while the plans also call for new equipment in Grand River Avenue from Trumbull Avenue west. A number of construction projects are now under way.

New York Cars to Have Safety Devices

The New York Transit Commission has made public an order to all electric railways in the city to install additional safety devices. The order followed hearings before Commissioner Lockwood at which it was found that of 1,110 one-man cars in operation, 85 were without safety devices, and 510 were only partially equipped. The order provides specifically that all one-man cars shall be equipped with the following devices:

1. Sliding or folding doors, interlocked with either the controller or the air brake system.
2. The so-called "dead man button," which requires the weight of the motorman's hand on the controller handle, or his foot on the control valve. When either hand or foot is removed from the operating position, the power is cut off and the brakes automatically are set.
3. An emergency exit in addition to the regular entrance door.

The companies are directed to equip 25 per cent of their one-man cars with the devices within six months, an additional 25 per cent within a year, and the remainder in from eighteen months to two years.

Exhibitograph No. 13

Important to Exhibitors!

Return orders for current, compressed air, furniture, flowers and drinking water to

Exhibit Committee
American Electric Railway Association
292 Madison Avenue
New York City

NOW

if you haven't already done so.

Improved Facilities for Steel in Miami Valley

Linking of the American Rolling Mill Company and the Hamilton Iron & Coke Company by the transportation of a ladle of hot metal from the blast furnace at Hamilton, Ohio, to the East Works of Armco at Middletown, Ohio, by way of a special track built by the Baltimore & Ohio Railroad, marks another epochal event in the industrial life of the Miami Valley. The event heralds the beginning of a new era in steel making in the valley, which has already become a great factor in the commerce and industry of the world, as it will tend to permanently stabilize the industry in this location.

Not only in steel making, but also in railroad transportation, is this event widely significant. Molten metal will be carried daily over 10 miles of track specially constructed for the purpose. Due to the concentrated load of such large tonnage, it was necessary to design and build a special bridge over the Miami River having almost 50 per cent greater capacity than any other railroad bridge ever built. It requires about 2½ hours to make a round trip to Middletown and there will be an average of four trips every 24 hours.

Three specially designed mixer ladles, double lined with fire brick, are used to carry the molten metal, which can, when necessary, be held in the ladle 48 hours. The capacity of these ladles is 150 tons each. The metal is poured from the large ladle car into a small open ladle, from which it is poured directly into the

Specifications on Ten Monongahela Cars

Five interurban and five city type cars are being built for the Monongahela-West Penn Public Service Company, Fairmont, W. Va., by the G. C. Kuhlman Car Company, as mentioned in the April 21 issue of the JOURNAL. They are of the one-man, two-man, motor driven, double-end, double-truck type.

Each car is 45 ft. 3 in. long, 8 ft. 6 in. wide and weighs 32,000 lb. The city type cars have a 30-in. seat spacing and accommodate 48 passengers. The interurban cars have a 33-in. seat spacing and seat 44 passengers. Window post spacing is 42 in. on all cars. The seats are wood in the city cars and leather upholstered in the interurban cars. The bodies are of semi-steel construction with arch roofs and folding end doors. Each truck is equipped with two inside-hung motors, and 22-in. rolled steel wheels. Further details are given in the accompanying specifications.

Weights:	
Car body	16,500 lb.
Trucks	9,000 lb.
Equipment	6,500 lb.
Total	32,000 lb.
Bolster centers	23 ft. 4 in.
Length over all	45 ft. 3 in.
Length over body posts	33 ft. 3 in.
Truck wheelbase	5 ft. 4 in.
Width over all	8 ft. 6 in.
Height, rail to trolley base	10 ft. ¼ in.
Window post spacing	42 in.
Body	Semi-steel
Roof	Arch
Doors	End, folding
Air brakes	Westinghouse
Armature bearings	Ball
Axles	Brill
Car signal system	Faraday
Compressors	Westinghouse DH-16
Conduit	Flexible, Duratube
Control	K-75-A
Curtain material	Pantasote
Destination signs	Railway standard
Door mechanism	National Pneumatic
Finish	Glidden Ripolin enamel
Floor covering	Linoleum—interurban cars
Gears and pinions	Westinghouse W-N drive
Glass	P. S. A. selected
Hand brakes	Peacock
Heat insulating material	Celotex
Heaters	Consolidated Car Heating Company
Headlights	O-B
Headlining	Agosote
Interior trim	Mahogany
Journal bearings	Plain
Journal boxes	Brill
Lamp fixtures	Ivanhoe
Motors	Four Westinghouse No. 1425, inside hung
Painting scheme	Orange
Roof material	Wood, canvas covered
Safety car devices	Safety Car Devices Company
Sash fixtures	Adams-Westlake
Seats	Brill
Seat spacing	City cars, 30 in.; interurban cars, 33 in.
Seating material	City cars, wood; interurban, Leather
Steps	Folding and stationary
Step treads	Kass
Trolley	O-B
Trolley base	Westinghouse
Trolley wheels	Westinghouse
Trucks	Brill 177-E1-X
Ventilators	Brill
Wheels, type	Rolled steel 22 in. diameter
Wheelguards	H-B

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open hearth furnaces for the necessary refining process. This constitutes an important economy over the regular practice of charging cold pig iron into the open hearth, which practice requires many hours of high temperature to bring it to a molten state. The new practice saves much fuel, time, labor and wear on the furnace.

It is expected that the new arrangement will not only work out to the material advantages of the three interests, the railroad, the furnace company, and the rolling mill company, who co-operated in making it possible, but will be of considerable influence in the increased growth of the cities of Hamilton and Middletown and the improved facilities will further enlarge the market for steel products.

Talk on British Market at Advertising Convention

J. Heritage Peters, head of the Heritage Peters Advertising Service, Ltd., Coventry, England, is to be one of the speakers at the International Advertising Association Convention at Detroit in July. Mr. Peters is scheduled to make several addresses while he is in this country. He will discuss the peculiarities of the British market and will illustrate how American advertising has to be refashioned to appeal to the British reader.

Conference Held on Shipping Tags

Manufacturers of shipping tags held a preliminary conference at the Department of Commerce on June 25, under the auspices of the Division of Simplified Practice, Bureau of Standards, and considered a report that had been compiled from a survey of variety among manufacturers.

This conference concluded that further study of all phases of the situation, as revealed by the report, would be necessary before a tentative recommendation could be presented for final action. A committee was appointed to make this study, which will include nomenclature to clearly define stock, including thicknesses, sizes of tags and color of stock. George Schuster, representing the Division of Simplified Practice, will assist this committee in making the study.

The personnel of the committee is as follows: O. L. Moore, chairman, secretary, Tag Manufacturers' Association, Chicago; William R. Eastwood, Reyburn Manufacturing Company, Philadelphia; E. B. Graupner, International Tag Company, Chicago; George M. Huey, Denney Tag Company, West Chester, Pa.; H. E. Reynolds, Dennison Manufacturing Company, Framingham, Mass.

METAL, COAL AND MATERIAL PRICES

F. O. B. REFINERY	June 26, 1928
Metals—New York	
Copper electrolytic, cents per lb.	14.525
Copper wires, cents per lb.	16.625
Lead, cents per lb.	6.30
Zinc, cents per lb.	6.525
Tin, Straits, cents per lb.	46.125
Bituminous Coal, f.o.b. Mines	
Smokeless mine run, .o.b. vessel, Hampton Roads, gross tons	4.175
Somerset mine run, f.o.b. mines, net tons	1.875
Pittsburgh mine run, Pittsburgh, net tons	1.8
Franklin, Ill., screenings, Chicago, net tons	1.70
Central, Ill., screenings, Chicago, net tons	1.6
Kansas screenings, Kansas City, net tons	2.35
Materials	
Rubber-covered wire, N. Y., No. 14, per 1,000 ft.	5.3
Weather rppf wire base, N.Y., cents per lb.	17.125
Cement, Chicago net prices, without bags	2.05
Linseed oil (5-bb lots) N. Y., cents per lb.	10.6
White lead in oil (100-lb. keg), N. Y., cents per lb.	13.75
Turpentine (bbl. lots), N. Y., per gal.	$0.6125

ROLLING STOCK

BRYAN-COLLEGE TRACTION COMPANY, Bryan, Tex., will purchase one new car.

NEW YORK STATE RAILWAYS, Rochester, N. Y., is rebuilding cars purchased from the New York & Harlem Railway.

PACIFIC ELECTRIC RAILWAY, Los Angeles, Cal., has ordered eighteen all-steel interurban cars and ten all-steel local passenger cars from the St. Louis Car Company, St. Louis, Mo.

DETROIT DEPARTMENT OF STREET RAILWAYS, Detroit, Mich., has been advised by W. B. Mayo to reject former bids on 25 to 50 new buses and to purchase sixty-seven 40-passenger street car type coaches.

COMMUNITY TRACTION COMPANY, Toledo, Ohio, is trying out two Twin Coaches of 40-passenger capacity on the Upton Avenue line.

CHICAGO & WEST TOWNS RAILWAY, Oak Park, Ill., has accepted delivery of five Mack four-cylinder chassis, 225-in. wheelbase buses.

CONNECTICUT COMPANY, New Haven, Conn., has accepted delivery of four Mack four-cylinder chassis, 230-in. wheelbase coaches.

TRACK AND LINE

BRITISH COLUMBIA ELECTRIC RAILWAY, Vancouver, B. C., Canada, has ordered $88,000 worth of underground cable for use in proposed underground subways from the Main Street subway and the subway being constructed to serve the New Westminster elevator.

MONTREAL TRAMWAYS, Montreal, Canada, plans about 11.9 miles of single track extension this year and about 14.55 miles of track renewals. A petition from residents has been laid before City Council for the extension of track on Rosemount Boulevard to the Franciscan monastery.

SASKATOON MUNICIPAL RAILWAY, Saskatoon, Sask., Canada, has applied to the local government board for approval of expenditures of $23,000 for double tracking existing lines.

ARKANSAS POWER & LIGHT COMPANY, Pine Bluff, Ark., is constructing new track on Ash Street from Second Avenue to Rollin Street.

SEATTLE MUNICIPAL STREET RAILWAY, Seattle, Wash., has received a bid from Bethlehem Steel Company of $33,195 for eight pieces of special track work.

SHOPS AND BUILDINGS

OKLAHOMA RAILWAY, Oklahoma City, Okla., is remodeling and extending the waiting room at its terminal station in Oklahoma City, at a cost of approximately $25,000.

PETERSBURGH, HOPEWELL & CITY POINT RAILWAY, Petersburgh, Va., has had its carhouse and two cars destroyed by fire. The loss is estimated at $30,000.

CHICAGO & JOLIET ELECTRIC RAILWAY, Joliet, Ill., will begin installation of an automatic electric substation at Lemont, July 1. C. K. Gibbon, Schenectady, N. Y., is preparing plans and will have charge of the installation which is expected to be completed by August 1.

PACIFIC GAS & ELECTRIC COMPANY, San Francisco, Cal., has approved a fund of $278,000 for a substation.

PHILADELPHIA RAPID TRANSIT COMPANY, Philadelphia, Pa., will have erected a one-story brick and steel surface car terminal building at the corner of Broad Street and Olney Avenue. The work will be done by the Rapid Transit Construction Company at an estimated cost of $40,000.

TRADE NOTES

WALTER JACKSON, Mount Vernon, N. Y., fare and motor bus consultant, sailed for Europe on June 27 on the *Berengaria* to make transportation studies in his specialties as in past years. He will study fare problems in the larger cities and will spend part of his time on vacation in Southern France and Austria. Communications to reach London by Sept. 5 may be addressed to him care of J. P. Thomas, operating manager, London Underground Railways. Mr. Jackson plans to return in time for the American Electric Railway Association Convention in September at Cleveland, Ohio.

ROLLER-SMITH COMPANY, New York, announces that the state of Texas is now being handled by John A. Coleman, 1006 Washington Avenue, Houston, Tex., and the states of Colorado, Utah, Wyoming and northern New Mexico are now being handled by H. T. Weeks, U. S. National Bank Building, Denver, Col.

FRED W. ROTH, who has been with the Ohio Brass Company for the past eleven years introducing and selling its car equipment devices in the South, Southwest and Middle West, has now joined the supply sales division of the J. G. Brill Company, for which he will travel the Eastern and Southern states.

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Electric Railway Journal

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1928

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Perhaps no city in this country has such an unusual street layout as San Francisco. To be sure, it has a serious traffic problem. To evolve suggestions to relieve the situation a traffic survey was made, with Dr. Miller McClintock as director. Every problem was studied and many helpful recommendations, based on data secured, were made.

Milwaukee Builds Practice Track and Road ... 1065

No stone has been left unturned by the Milwaukee Electric Lines in providing for the proper instruction of its trainmen and bus drivers. With a private right-of-way and road to duplicate actual service conditions the operators are certain to become proficient before being assigned to regular runs.

Car Shop and Garage Is of Latest Design 1068

By C. J. PORTER

Just another car shop and garage? Decidedly, not! Its location, design, construction, equipment and utility all contribute to make this building another worthy product of this modernization era.

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Next Week—

Milan's Americanized Car

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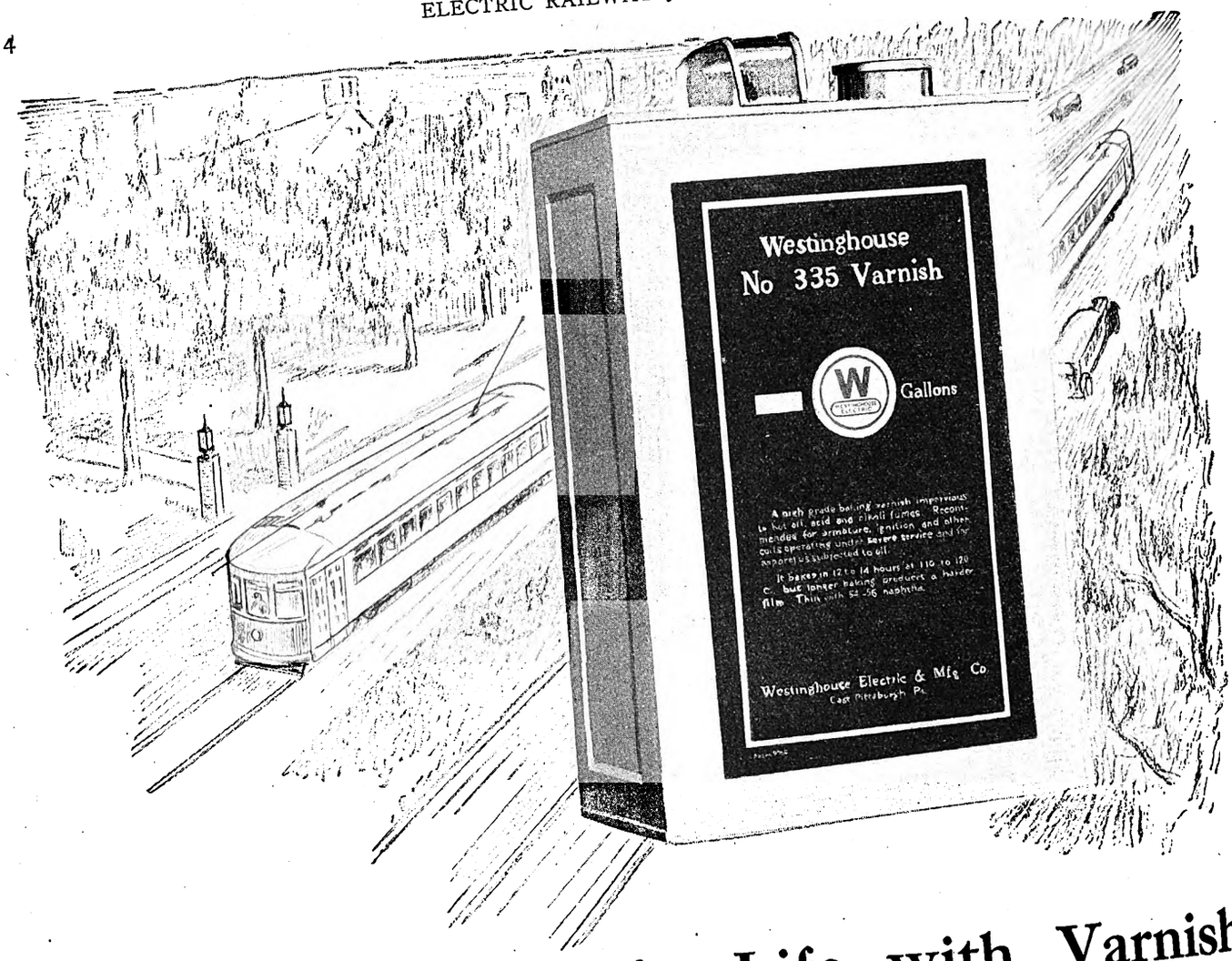

Prolong Service-Life with Varnish

WHEN railway motors are dipped and baked in Westinghouse Varnish No. 335, their service-life is greatly prolonged. Varnish No. 335 is not only immune to oil and water, but it also protects the motor insulation against the effects of vibration and excessive heat. Furthermore, Westinghouse varnish does more than save the surface—it insulates. When specifying varnish for railway motors, consider first its ability to protect and to insulate. These factors are your assurances of long service-life.

Using Westinghouse Insulating Materials Is Like Owning a Million Dollar Laboratory

Westinghouse Insulating Materials

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- Untreated Tapes
- Cord and Thread
- Sleeving
- Treated Papers
- Treated Fabrics
- Untreated Papers
- Untreated Fabrics
- Micarta Sheets
- Micarta Tubes
- Micarta Formed Shapes
- Mica Sheets
- Mica Tubes
- Varnishes
- Paints
- Japans
- Enamels
- Insulating Compounds
- Insulating Glue
- Transformer Oil
- Switch Oil

Westinghouse Electric & Manufacturing Company
East Pittsburgh Pennsylvania
Sales Offices in All Principal Cities of the United States and Foreign Countries

MEMBER AERA 1928

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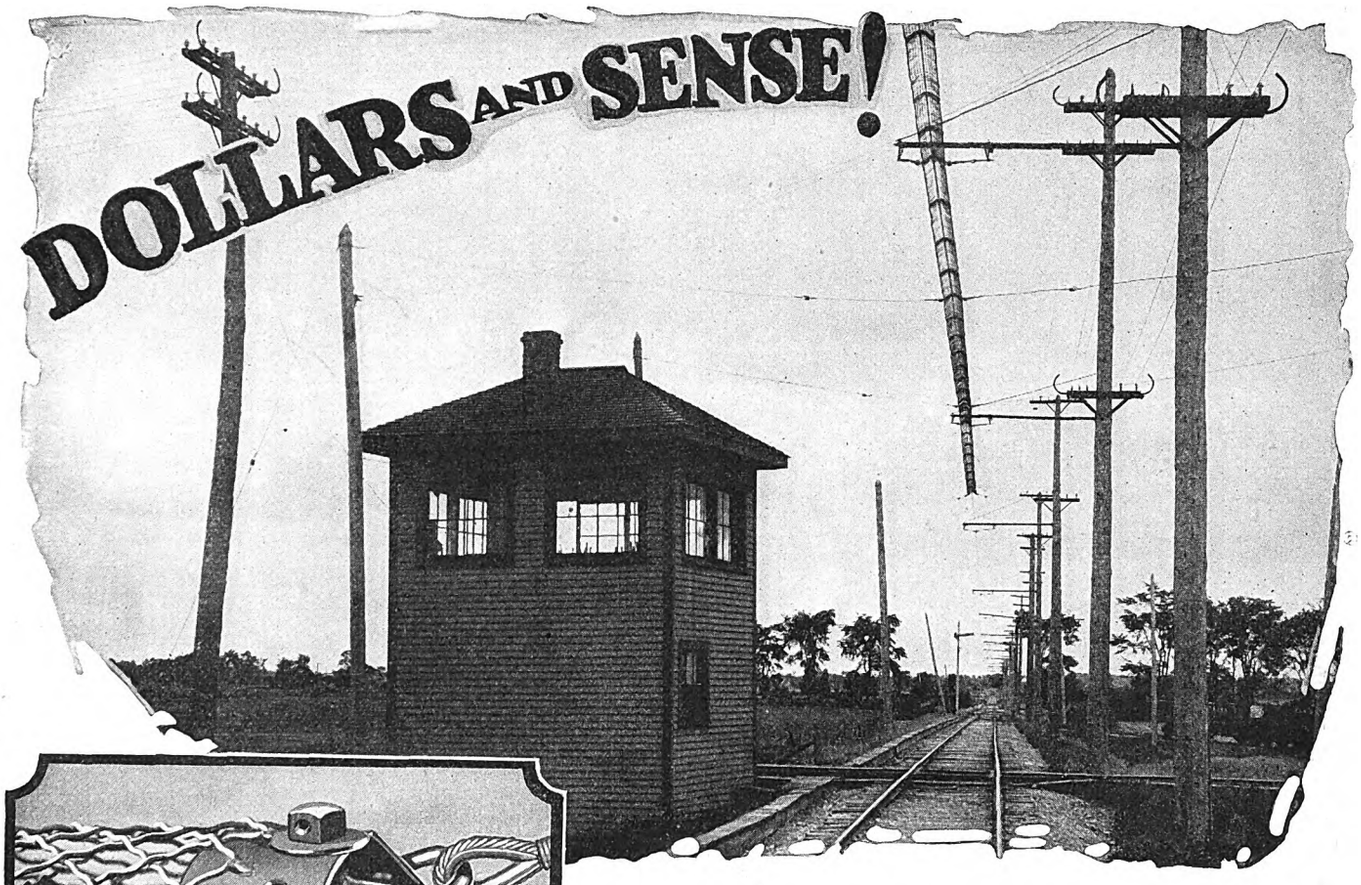
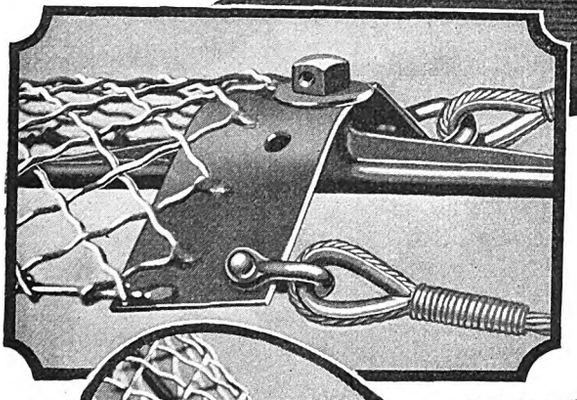
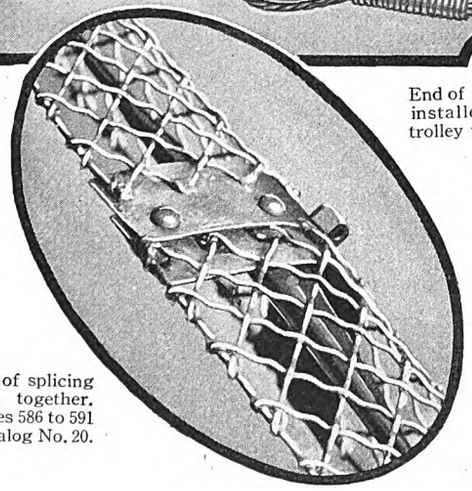




End of guard installed on trolley wire.



Method of splicing sections together. See pages 586 to 591 O-B Catalog No. 20.

Good will, in which thousands of dollars are invested, is only maintained by better service, and by the adoption of modern devices for further bettering service. Increased patronage is very probable, when riders know of these improvements. O-B Trolley Guard, in addition to reducing operating expense and thus adding to the "net", is a safeguard of your investment in good will.

Safe—and an Economic Necessity

THREE important factors have a decided influence on net profits. The first is savings from ***Safety.*** By protecting cars at railroad crossings, eliminating possible serious and costly accidents, O-B Trolley Guard plays a most important part in providing safety.

Service is the second factor. On it depends the good will of your patrons. O-B Trolley Guard prevents delays and saves time at crossings—making faster schedules possible and thus serving your riders better.

You ***Save*** money. One accident prevented by O-B Trolley Guard adds materially to the net. Faster schedules and elimination of delays reduce operating costs.

By its merit and service O-B Trolley Guard becomes an economic necessity. Low initial cost; handy ten-foot sections, factory formed ready to install, with yokes and plates attached; all go to make O-B Trolley Guard a sound "Dollars and Sense" investment.

Ohio Brass Company, Mansfield, Ohio
Canadian Ohio Brass Co., Limited
Niagara Falls, Canada
890L

Ohio Brass Co.

NEW YORK CHICAGO PHILADELPHIA PITTSBURGH ATLANTA CLEVELAND ST. LOUIS SAN FRANCISCO LOS ANGELES

PORCELAIN INSULATORS
LINE MATERIALS
RAIL BONDS
CAR EQUIPMENT
MINING MATERIALS
VALVES

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Increasing the Utility of Motor Transportation

Speedy highway transportation with the same degree of safety that the riding public has become accustomed to on railway vehicles attracts patronage.

Short, smooth stops, made without discomfort to patrons, permit higher schedule speeds and better running time.

Powerful retarding force, equalized to minimize skidding, easily controlled, and without driver fatigue, insures maximum safety under all road, traffic, and load conditions.

Automatic equalization of braking forces, combined with the absence of "brake riding" due to greater driver confidence, lengthens the life of linings and reduces frequency of adjustment, which results in a saving of material, labor and layover charges.

Westinghouse Air Brakes are increasing the utility of motorized transportation on many properties.

WESTINGHOUSE TRACTION BRAKE COMPANY

Automotive Brake Division - - - - - *Wilmerding, Penna.*

6225

WESTINGHOUSE AUTOMOTIVE AIR BRAKES

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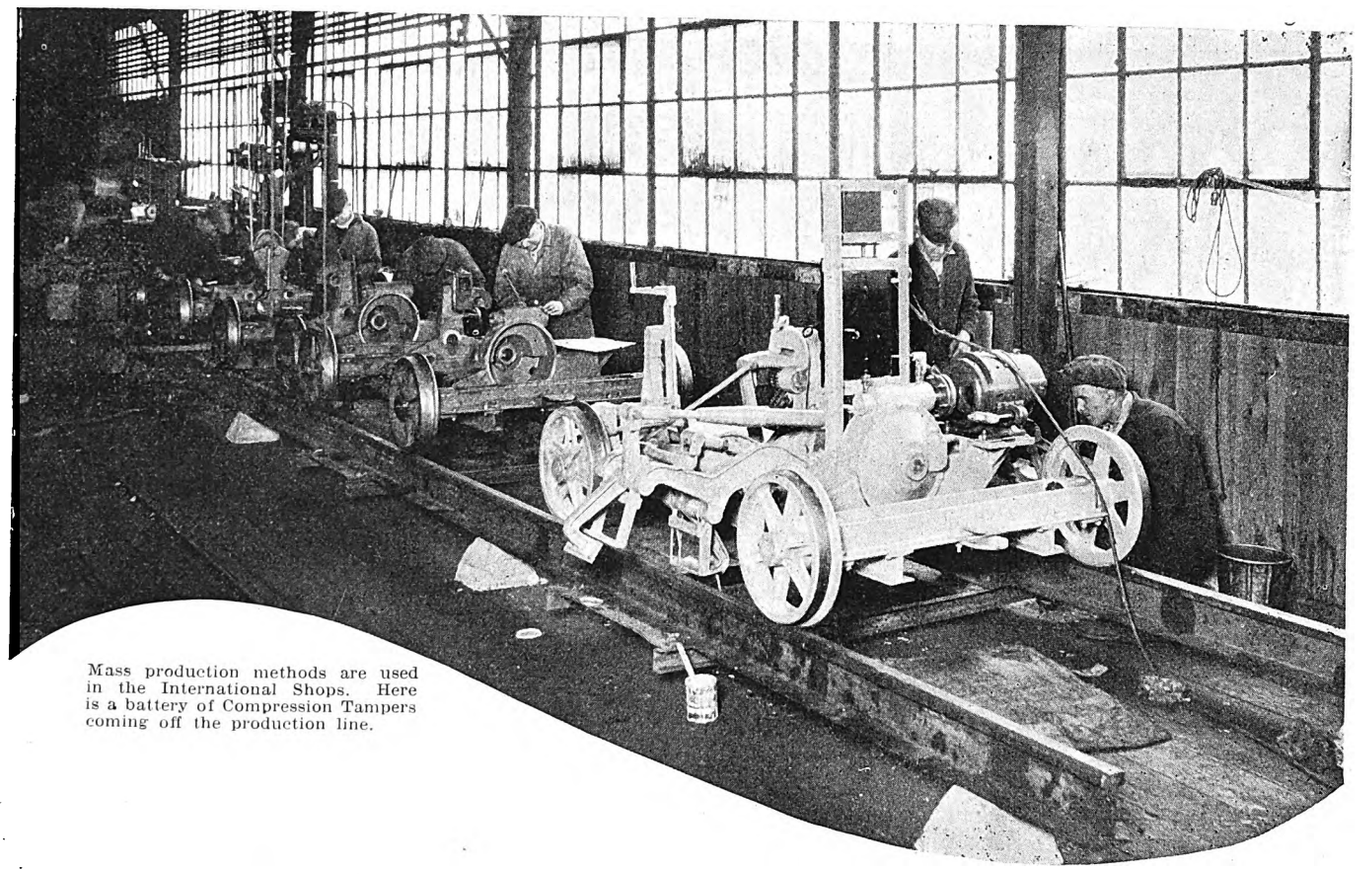

Mass production methods are used in the International Shops. Here is a battery of Compression Tampers coming off the production line.

This Is A Machine Age!

THAT'S not a startling head line—you knew it all the time. But are *you* taking full advantage of the *benefits* of machinery?

Take paved track construction. With a lot of shovels, picks, maul, crowbars, tongs and *strong backs* you can build paved track

OR

With a compression tamper and a tie layer and the power overhead, you can build paved track.

What's the difference?

Hand labor construction is less durable, takes more time to do and costs a great deal more.

But take the machine method, and Steel Twin Ties—better track at *less* cost every time.

Can you think of any reasons why you shouldn't use mass production methods and Steel Twin Ties?

Better let us quote you on delivered prices for third quarter delivery. (You can lease a tamping machine from us—we'll deliver it and call for it).

THE INTERNATIONAL STEEL TIE CO.
CLEVELAND, OHIO

STEEL TWIN TIE TRACK
THE BASE OF MODERNIZATION

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PROMPT SERVICE

PROMPT shipment of quality Creosoted Pine Poles is an outstanding feature of ***International*** Service.

A large supply of poles ready for "Ship today" Service is carried in stock. Specially framed poles in any quantity, size or type of framing, can be obtained on short notice.

To facilitate the prompt shipment of such poles, ***International*** maintains a corps of expert framers to frame poles before treatment in exact accordance with any specification.

The Texarkana plant has two of the largest treating cylinders in the wood preserving industry. These cylinders together with extensive power equipment enable ***International*** to treat and handle efficiently and economically poles in large quantity and render a service that is unexcelled in the Creosoted Pine Pole Industry.

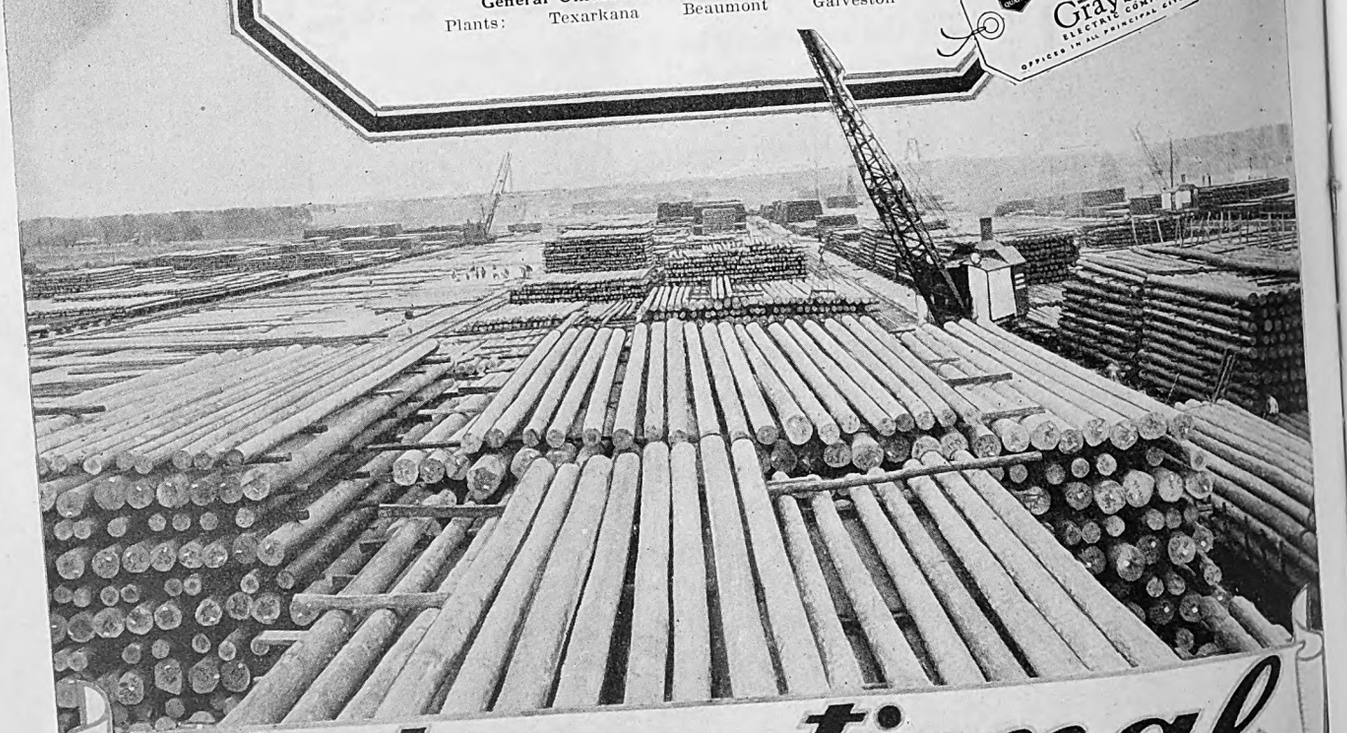
Illustration shows a section of the seasoning and framing yard at Texarkana which is tile drained and kept free from vegetation.

International Creosoting & Construction Co.

General Offices—Galveston, Texas

Plants: Texarkana Beaumont Galveston

Distributed by Graybar Electric Company



International Creosoted Yellow Pine Poles

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Golden Glow

Type DG Golden Glow Headlight for city service. Being fitted with a Golden Glow prismatic reflector it illuminates a wide area adjacent to and for about 50 feet ahead of the car.

Safety!

Safety is the watchword of today's transportation needs. Accidents are dangerous, costly and a constant drain on resources. Safety pays dividends.

Good headlights provide this safety in night operation—while makeshift headlights or marker-lights are entirely inadequate in competition with the brilliant lighting of swiftly moving automobile traffic.

Let us tell you about Golden Glow Headlights fully described in our latest pamphlets. Send for copies today.

Home office and plant at 17th & Cambria Sts., PHILADELPHIA; District Offices at 111 N. Canal St., CHICAGO; 50 Church St., NEW YORK; Bessemer Bldg., Pittsburgh; 88 Broad St., Boston; General Motors Bldg., Detroit; 316 N. Washington Ave., Scranton; Canadian Agents, Lyman Tube & Supply Company, Ltd., Montreal, Toronto, Vancouver.

ELECTRIC SERVICE SUPPLIES CO.

MANUFACTURER OF RAILWAY POWER AND INDUSTRIAL ELECTRICAL MATERIAL

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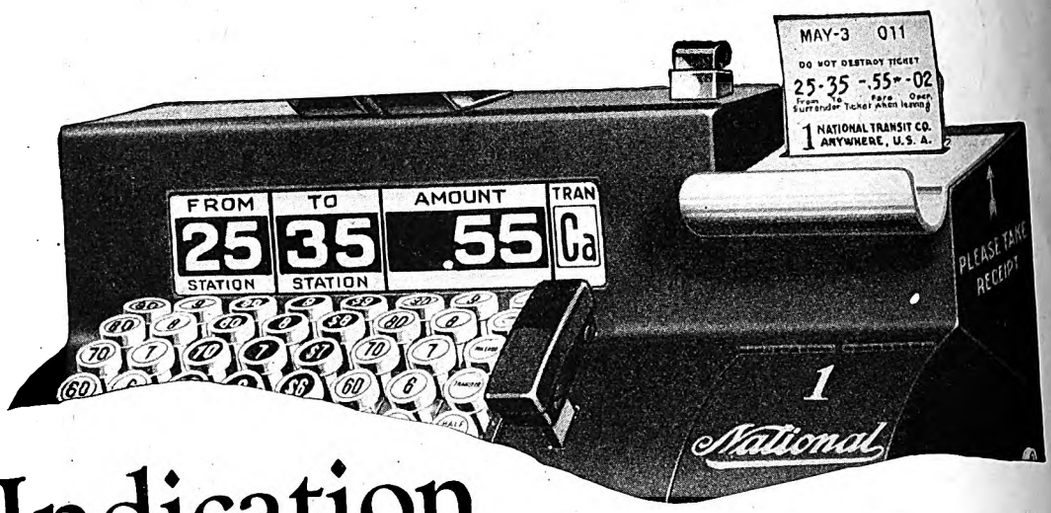

The Indication

an important feature of National Fare Registers

The public indication is one of the most important of the ten distinctive features of National Fare Registers. It shows the amount of each fare, the zone from and to and the kind of transaction. It is visible to other passengers in the car as well as to the passenger paying fare.

It makes inspection and checking easy and accurate because inspector gets complete information about each fare. Without this public indication there could not be complete protection for fares collected.

The National Fare Register has other distinctive features which have made it the choice of well-known electric railway operators. A ticket of convenient size printed and issued at the time the fare is recorded, shows zone from and to, amount of fare, date, operator's number and other information. A printed trip sheet locked inside the machine gives a consecutive record of each fare. A fast operating keyboard and electric motor insure quick loading.

Electric railway operators have found National Fare Registers a protection for receipts, a means of reducing operating costs and a method of speeding service that has never before been available.

There are 252 National Cash Register offices in the United States and Canada, each a service station for National Fare Registers. Our nearest representative will be glad to give complete information and demonstrate this new register.

The indication of the National Fare Register is visible to passengers in the car.

The National Fare Register is small and compact, easy to install and fast in operation. It is sturdy in construction and will stand up under hard usage.

National Fare Registers

Product of The National Cash Register Company

Dayton, Ohio

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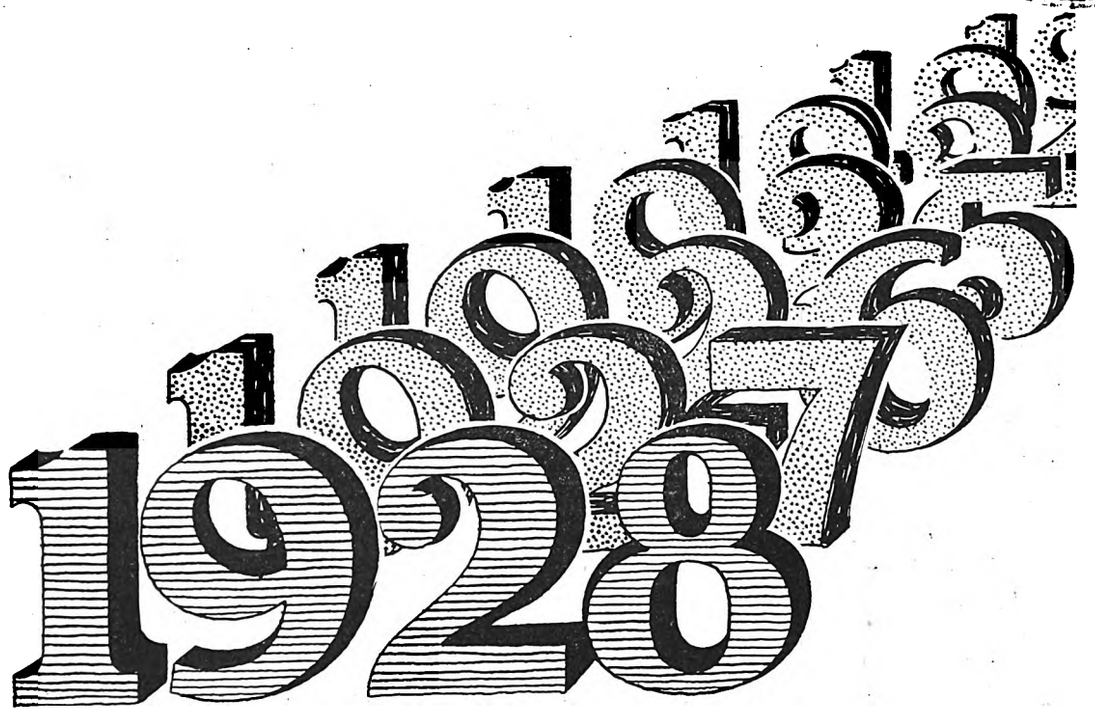
-Today, the Twin
Coach is generally
conceded to lead
the sales field in
larger type coaches

UNIVERSITY LIBRARY



Year by year the Electric Railway Industry is advancing. This advancement is due to the efforts of those in places of responsibility. It is their determination to keep abreast of the times and their desire to give the traveling public what it wants, that is bringing about this advancement. New and modern equipment, public relations, and a study of street transportation are important factors. Many of the leading operators have seen the advantages of treadle-ization and have adopted the NP Automatic Treadle.

TREADLE-IZE!

NATIONAL PNEUMATIC COMPANY

Executive Office: Graybar Building, New York

General Works: Rahway, New Jersey

MANUFACTURED IN TORONTO, CANADA, BY
Railway & Power Engineering Corp., Ltd.

CHICAGO
518 McCormick Building

PHILADELPHIA
1010 Colonial Trust Building

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Brill Gas-Electric Creates Enthusiasm

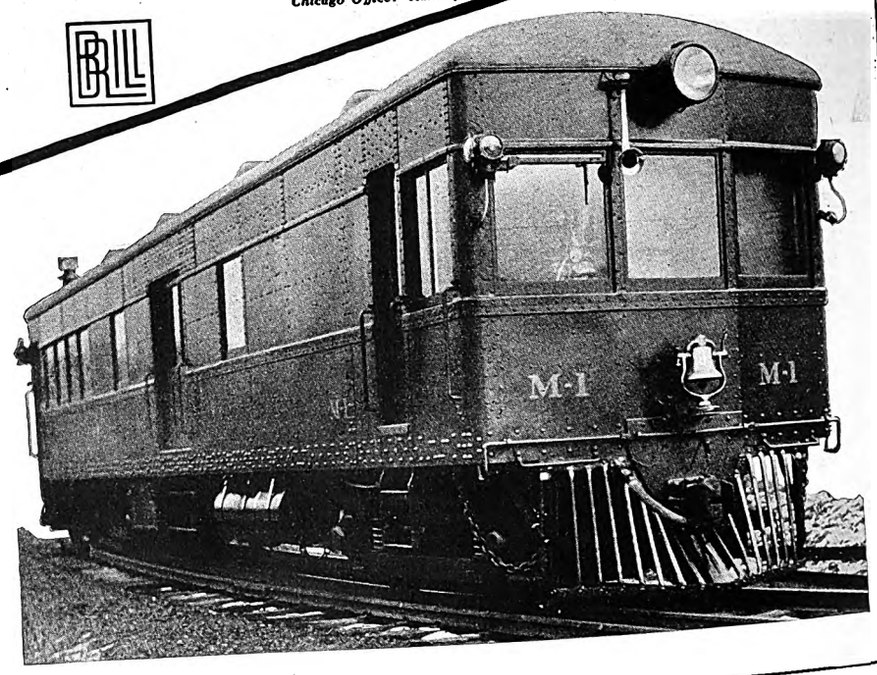
Since December 1926, a Brill Model 250 Gas-Electric Car has been in the service of the East Broad Top Railroad & Coal Company. This car is operating 140 miles a day, six days a week, between Mt. Union and Robertsdale, Pa.

Every official of the company is enthusiastic over its performance and proud of the fact that operating costs have been reduced to such a degree that very satisfactory profits are being obtained.

This particular car possesses the distinction of being the first Gas-Electric built for a narrow gauge railroad, so far as is known. It has demonstrated that it is economical and downright dependable.

Let us send you further information about this type of motive power.

AUTOMOTIVE CAR DIVISION
The J. G. Brill Company
Philadelphia, U. S. A.
Chicago Office: Railway Exchange Bldg.



"Satisfactory Profits are being obtained"

It has Timken Bearings

"Satisfactory profits" from Timken-equipped rolling stock such as this, are the invariable results of Timken tapered construction, Timken *POSITIVELY ALIGNED ROLLS*, and Timken-made electric steel. That means not only minimum friction losses and lubrication costs, but highest endurance, due to full thrust-radial capacity.

THE TIMKEN ROLLER BEARING CO.
CANTON, OHIO

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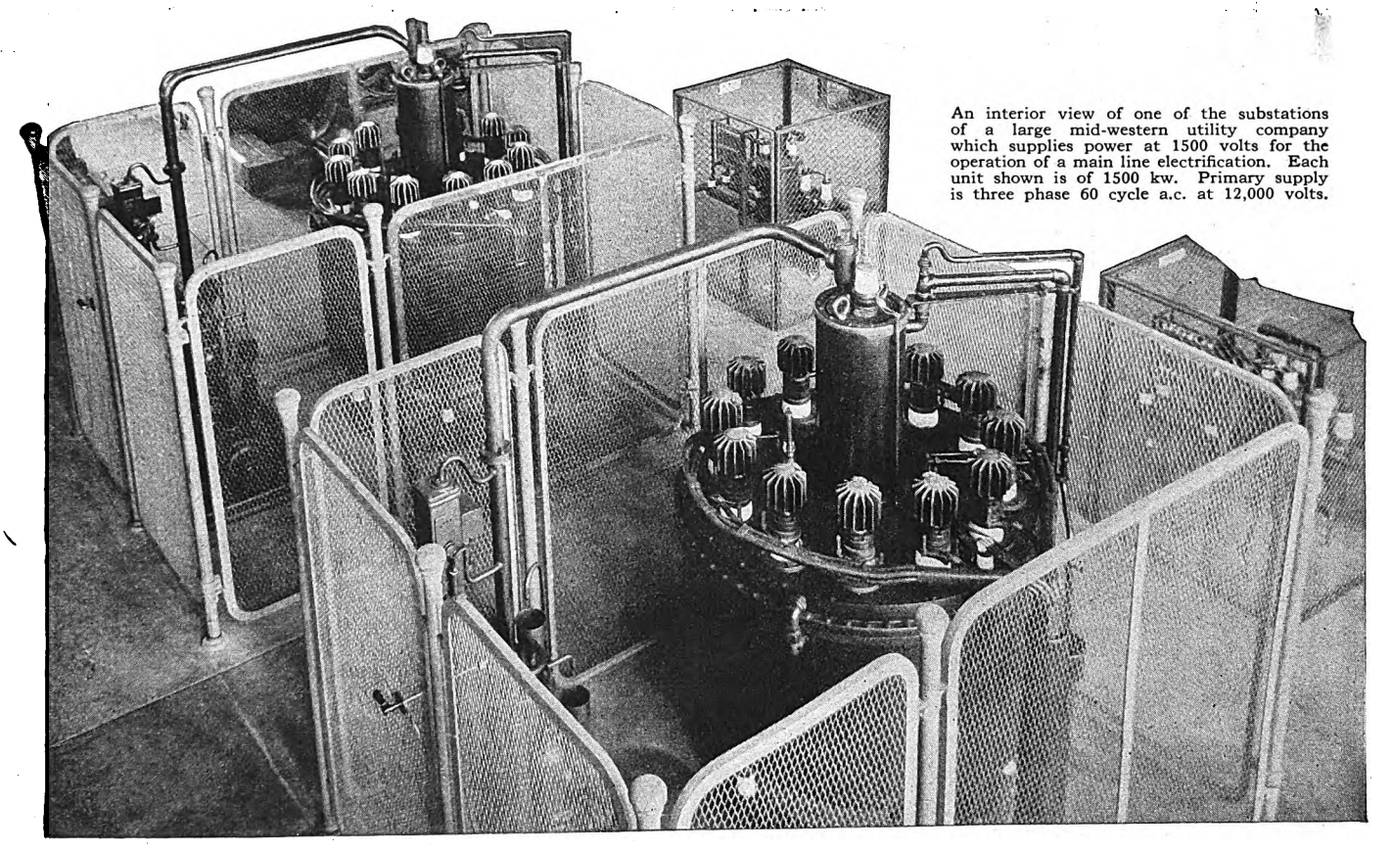

An interior view of one of the substations of a large mid-western utility company which supplies power at 1500 volts for the operation of a main line electrification. Each unit shown is of 1500 kw. Primary supply is three phase 60 cycle a.c. at 12,000 volts.

Higher voltages — higher efficiencies

VOLTAGES, customarily used in electric railway practice are high enough to show substantial efficiency gains where A-B-B rectifiers handle the conversion function. Beginning at about 4% saving over best rotary converter performance for all-day runs at 550 volts, they reach much higher gains in similar comparisons on properties operating at 1500 volts such as the one illustrated here. The exact percentage gained depends necessarily on the load characteristics of the system under consideration.

We shall be glad, upon receipt of inquiries, to supply typical load curve comparisons. Further advantages of A-B-B rectifiers are given below:—

Simple operation and minimum attention.
No synchronizing.
Very high momentary overload capacity and insensibility to short circuits.
Negligible maintenance.
Low weight. No special foundations.
Noiseless and vibrationless operation, consequently rectifier substations can be erected in densely populated localities.
New substations need only be of light construction. The plant can often be erected in places that could not be considered for rotating machinery.

AMERICAN BROWN BOVERI ELECTRIC CORPORATION
Camden, New Jersey

Principal Products

Electric Locomotives

Multiple Unit Cars

Diesel-Electric Locomotives

Car Lighting Equipment

Mercury Arc Power Rectifiers

Transformers

Automatic Voltage Regulators

Automatic Synchronizers

High Voltage Oil Circuit Breakers

Steam Turbo-Generator Sets

Turbo-Blowers and Compressors

Turbo-Exhausters and Boosters

Scavenging and Supercharging Blowers

AMERICAN BROWN BOVERI

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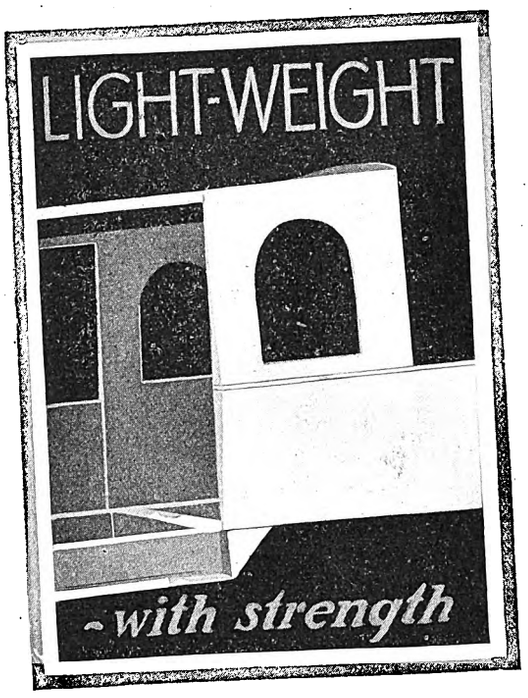
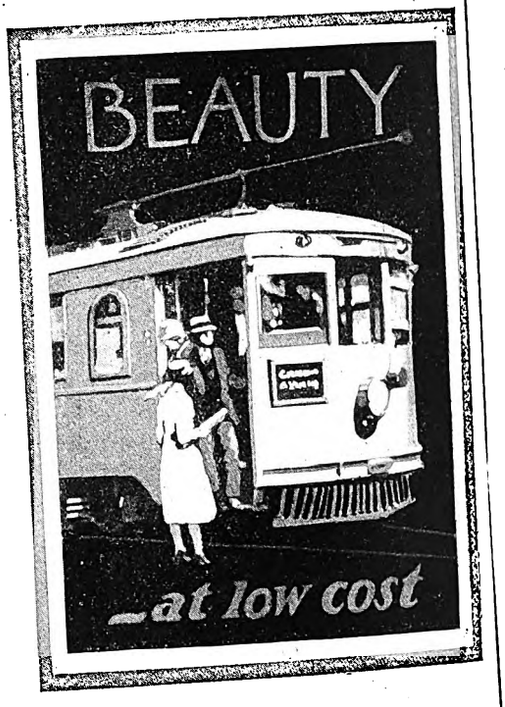
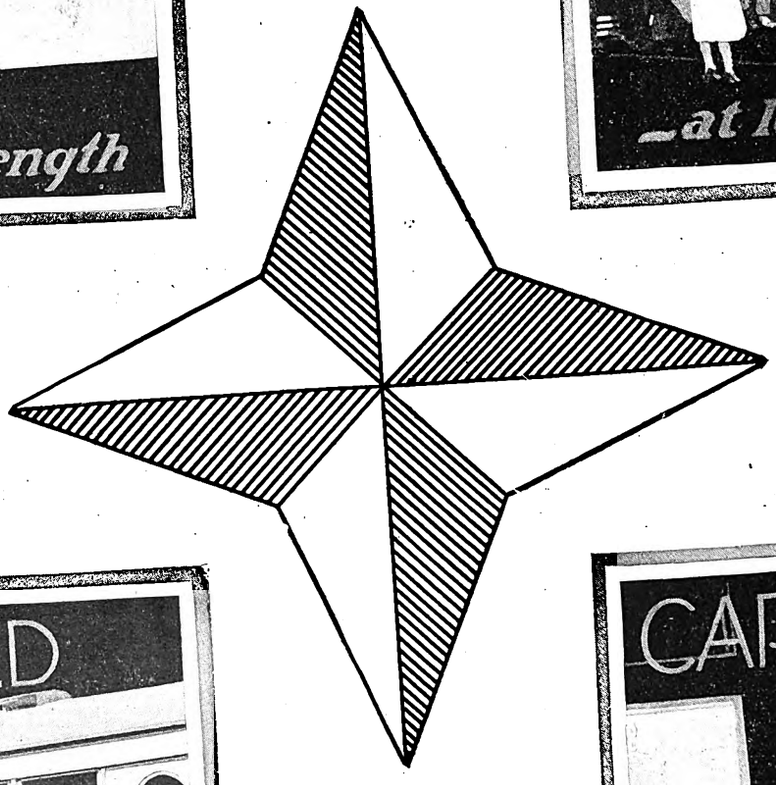
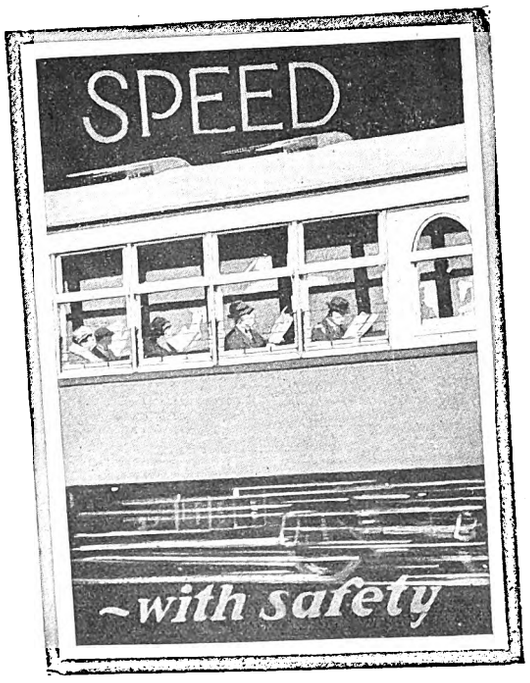
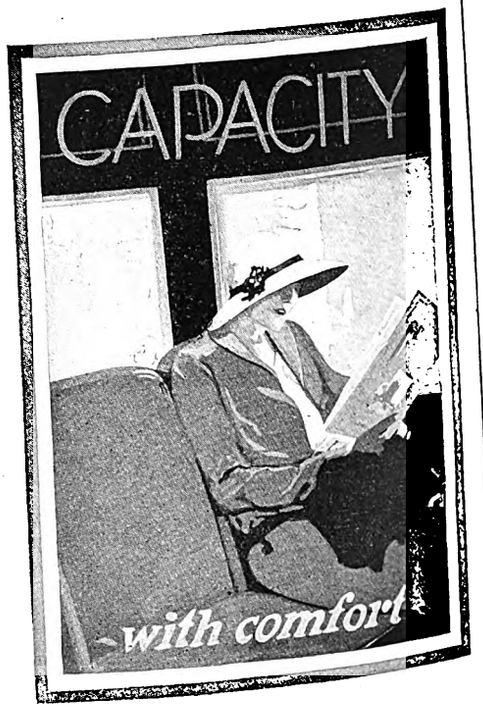
The rider WANTS to buy the











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the cardinal points of

CINCINNATI BALANCED LIGHTWEIGHT CARS

The soundness of his logic is unescapable. So, too, is the soundness of the logic of the operating company which heeds the preference.

Looking forward to the time when the purchase of new cars is at hand the Cincinnati Car Company is eager NOW to place the operating records of Cincinnati BALANCED LIGHTWEIGHT cars before you. Compare them with your own. That is the logical way for you to form opinions on which far-reaching decisions may be safely made. May we answer your questions?

CINCINNATI CAR COMPANY
CINCINNATI, OHIO

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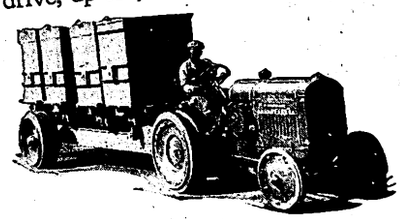
INTERNATIONAL Motor Trucks *and* McCORMICK-DEERING Industrial Tractors

Are Serving These Well-Known

Railroad, Express, *and* Related Companies:

American Railway Express
Atchison, Topeka & Sante Fe
Baltimore & Ohio
Big Four
Boston & Maine
Boston Elevated
British Columbia Electric Railway
Canada Steamship Lines
Canadian National Express
Canadian National Railway
Canadian Pacific Express
Canadian Pacific Railway
Central of Georgia
Chicago & Eastern Illinois
Chicago & North Western
Chicago, Burlington & Quincy
Chicago Junction Railway
Chicago, Milwaukee, St. Paul & Pacific
Chicago, Rock Island & Pacific
Denver, Rio Grande Western
East Mass. Street Railway
Elgin, Joliet & Eastern
Erie Railroad
Gary Railways
Great Northern
Illinois Central
Illinois Traction Co.
Indiana Service Corporation

THIS Chain-Drive Heavy-Duty ***International Truck*** is on the job for the Wabash Railway, working with a battery of All-Steel Semi-trailers. The outfit saves as high as 72 hours per shipment. It replaces hundreds of trap cars and line cars every month. The railroads are using every size and type of truck in the International Line, including the ¾-ton Special Delivery; 4 and 6-cylinder Speed Trucks for 1¼, 1½, and 2-ton loads; and the Heavy-Duties, double-reduction and chain-drive, up to 5-ton.



AMONG the enthusiastic users of the **McCormick-Deering Industrial Tractor** are many of the biggest railroads. Compact, flexible, many-sided, durable, *liberally powerful* power. For yards, repair shops, stores and material supply departments, etc. It hauls, lifts, pushes, and combines to operate a variety of equipment. Power three ways—drawbar, belt and power take-off. Built *complete* by International Harvester. We will be glad to demonstrate the capacity, power, and economy of this highly modern power.

Interstate Public Service Co.
Lehigh Valley
Louisville & Nashville
McCormick Steamship Co.
Milwaukee Electric Railway
Minneapolis & St. Louis
Missouri, Kansas & Texas
Missouri Pacific
Monon Route
New York Central Lines
New York, New Haven & Hartford
Nickel Plate Road
Norfolk & Western
Northern Ohio Traction Lines
Northern Pacific
Norton Lilly Steamship Co.
Oregon, Washington R. & N. Co.
Pennsylvania System
Philadelphia & Reading
Pittsburgh & Lake Erie
Pullman Company
St. Louis Southwestern
Seaboard Air Line
Soo Line
Southeastern Express
Southern Pacific
Southern Railway
Texas & Pacific
Union Pacific
Wabash

Send inquiries regarding International Trucks and McCormick-Deering Industrial Tractors to the address below

INTERNATIONAL HARVESTER COMPANY
OF AMERICA
[Incorporated]
606 So. Michigan Ave. Chicago, Illinois

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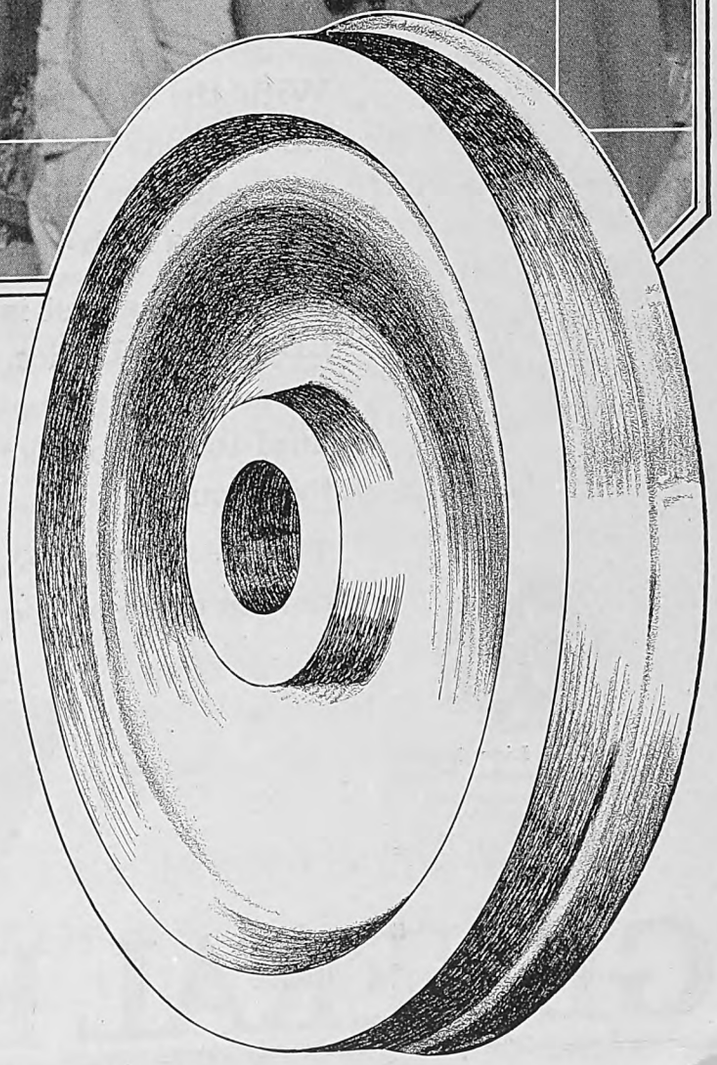

It's the *Coach* That Carries the Crowd . . . . . But It's the *Wheels* That Carry the Coach

And so, in electric railway service, with its steep peak periods and the ever recurring emergencies that heavy traffic creates, the best wheel made is only good enough.

Gary Wrought Steel Wheels are manufactured in quantity but under a system of individual attention that assures the same physical and chemical precision as if only one wheel were made each day,

Our wheel specialists are at your command,

Illinois Steel Company

General Offices:
208 South La Salle Street
Chicago, Illinois

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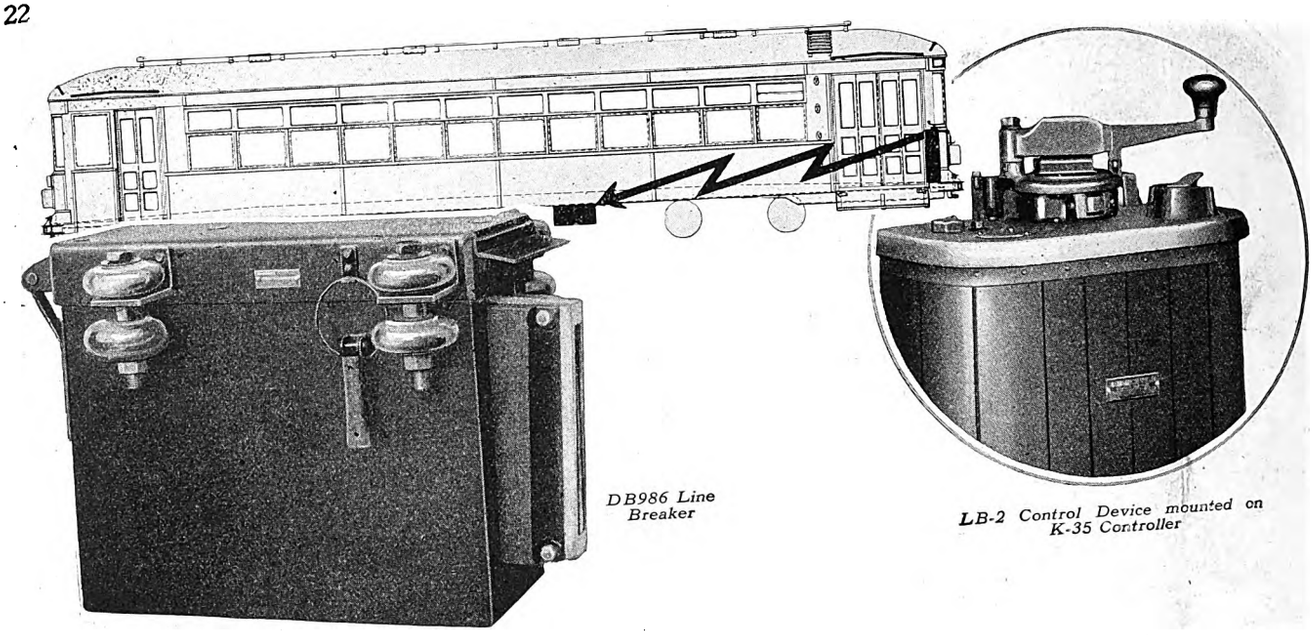


DB986 Line Breaker

LB-2 Control Device mounted on K-35 Controller

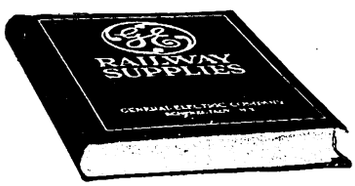
Break the Current under the Car

With the new G-E Line Breaker Control Device, arcing from heavy currents, ordinarily ruptured in the controller or overhead circuit breaker, is transferred to a high-speed line breaker under the car.

The whole secret is in the slight lost motion in the LB Control Device. When the controller is turned toward the "off" position, the cylinder does not move until the line breaker has done its work in rupturing the circuit.

Twenty-five hundred of these LB Control Devices are now in operation on seventy-five properties.

The G-E Line Breaker and LB Control Device are typical examples of G-E developments produced primarily to protect and save equipment.



330-44

GENERAL ELECTRIC

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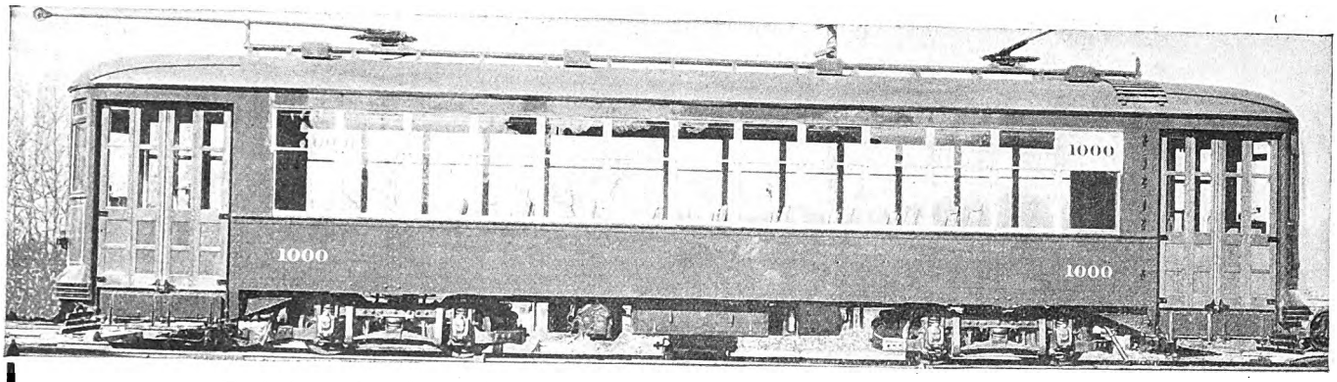
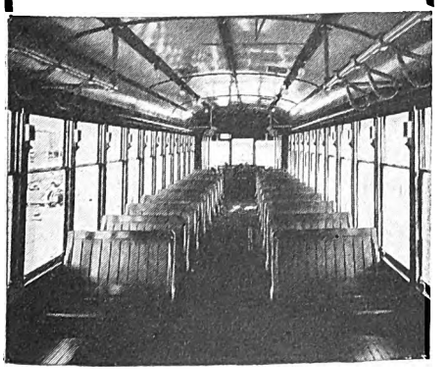


Typical exterior of one of the twenty new cars for the New Orleans Public Service, Inc.

The Peacock Staffless



Interior view of one of the twenty cars for the New Orleans Public Service, Inc.

Twenty more for New Orleans—

equipped with

"Peacock" Staffless Brakes!

Reg. U. S. Pat. Off.

Again the New Orleans Public Service, Inc., repeats on "Peacock" Staffless Brakes!

Twenty all-steel, one-man, two-man, double-truck, double-end cars, thus equipped, were placed in service about February 1st. These new cars are but a small part of the present rehabilitation plan for the Company. And on all of the new rolling stock "Peacock" Staffless Brakes are standard equipment!

Their reliability and dependability are factors that influence repeat orders from operators throughout this country and Canada.

Many advantageous features especially adapt "Peacock" Staffless Brakes to modern cars. Shall we tell you about them?

National Brake Company, Inc.

890 Ellicott Square Buffalo, N. Y.

Canadian Representative:
Lyman Tube & Supply Co., Ltd., Montreal, Canada

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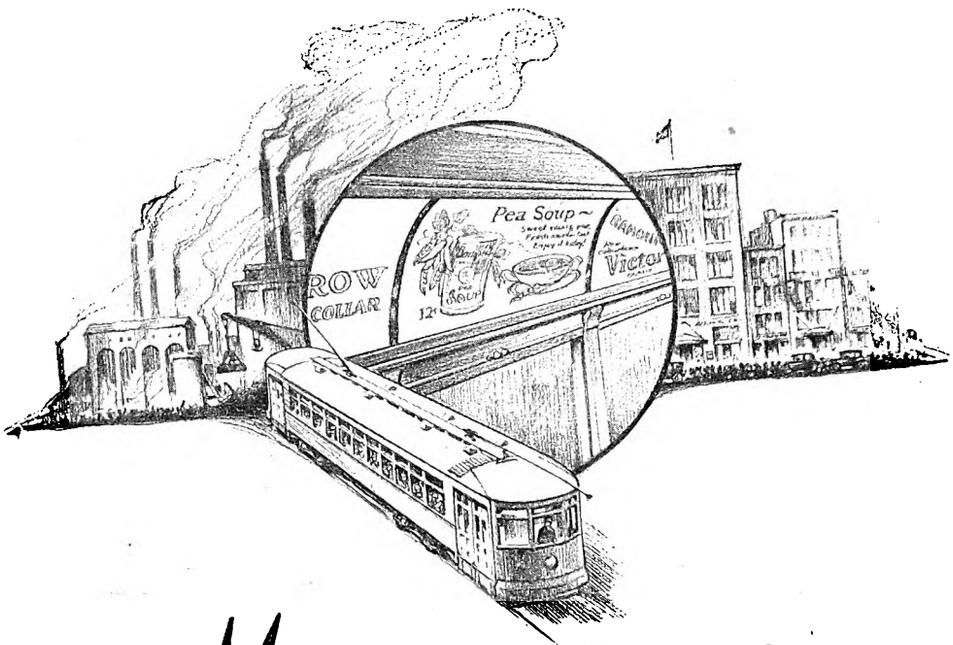

Mutual Service

TO the manufacturers and distributors of America and the street railway systems that transport the millions of America's potential buyers, Collier offers a mutual service.

This service has brought the street railway riders in thousands of cities and towns throughout the country to look upon car cards as extremely useful and pleasing features of up-to-date street car service. It has given national and local advertisers a medium thru which they can get their messages to selected territories easily, economically and convincingly.

Our business is one of service—service to the street railway industry, service to America's national and local advertisers, service to the millions of people who daily ride on street cars.

CANDLER BUILDING
NEW YORK, N. Y.

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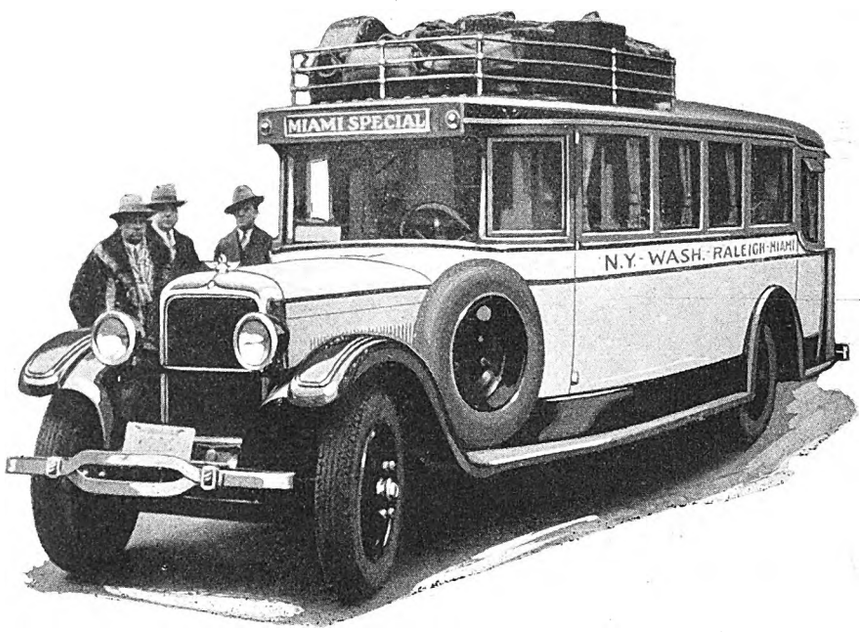
New York to Miami—
STUDEBAKER Comfort all the Way!

"Headin' South" in Studebaker busses means more comfort for passengers—more business for the Scenic Transportation Co., which operates three Studebaker busses between New York and Miami.



The Scenic Transportation Company, realizing the vital importance of selecting the type of bus that would successfully meet every requirement, bought Studebaker "Seminole" busses after a thorough investigation. Studebaker won the order because this equipment cost less to buy and less to run. Proof of economy was found in the experience of hundreds of Studebaker bus operators who reported low operating and maintenance expense, low depreciation, long life.

Each day the New York-Miami busses average 325 miles, stopping at night at good hotels in principal cities. So popular is this new line, that, on February 4, the demand for seats was so heavy on the north-bound trip that 24 passengers were turned away.

Pronounced Rider Appeal

Ability to perform under all conditions with train schedule regularity is an established reputation of the "Seminole" on this long run. The deep leather cushions, set at restful angles with plenty of knee room, insure a relaxed, comfortable ride. Wide windows, ample ventilation, and odor-free heating are features that attract riders and insure profitable operation to the operator.

* * *

Lower
first cost
operating cost
maintenance
depreciation

Studebaker Bus Models and Prices

75 Junior Chassis—158-inch W. B.	
Chassis only, single or dual rear wheels	$2410
15-Pass. Cross-Seat Sedan	4520
76 Special Chassis—184-inch W. B.	
Chassis only, single or dual rear wheels	$2775
15-Pass. Cross-Seat Sedan	5275
20-Pass. Parlor Car De Luxe	6395
22-Pass. Seminole Observation Parlor Car	6395
75 Heavy Duty Chassis—184-inch W. B.	
Chassis only, dual rear wheels	$3275
21-Pass. St. Car Bus	5895

All prices f.o.b. factory. Purchase can be arranged on Studebaker's liberal budget payment plan

STUDEBAKERS ARE PROFIT MAKERS

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BARGH HAI

In India the wizard selects a native susceptible to his hynotic powers.

—cloaks him in a panther skin.

—gives him a magic beverage.

—stares into his eyes and says "bargh hai" meaning "you're a panther."

Then he bids him go after an enemy who is termed an antelope.

The action is then a mixup of imitation panther vs imitation antelope, and the result is the same as putting some hocus pocus on misapplied carbon brushes and saying to the buyer "now you will get the service of Morganite brushes."

But when the spell wears off, the buyer comes to.

To what?

To Morganite, of course!

Morganite Brush Co., Inc.

Main Office and Factory

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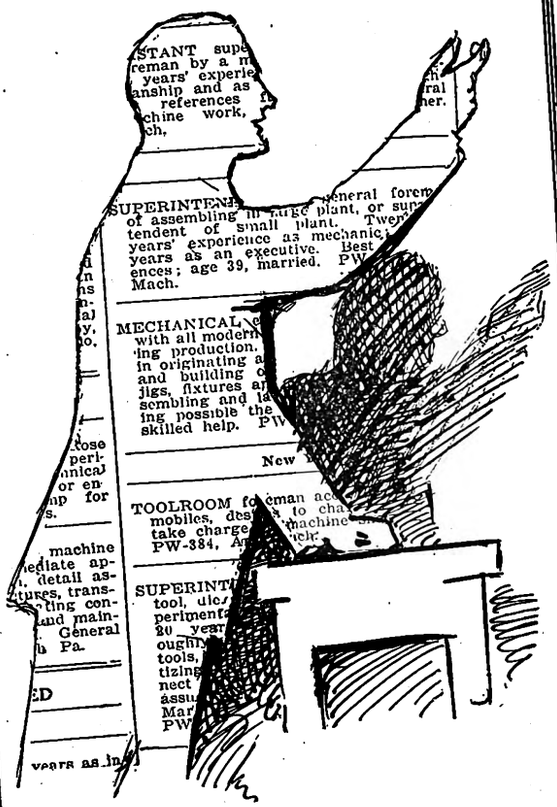

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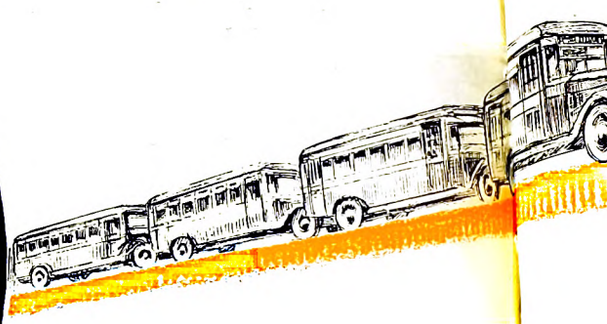

Of the 152 companies who operate 5 or more Yellow Coaches, 124 or 82% have placed repeat orders *at least once*!

98 of these companies or 64½% have placed repeat orders *at least twice*!

These 124 companies have placed a total of 535 repeat orders *and operate a total of*

4231 YELLOW COACHES

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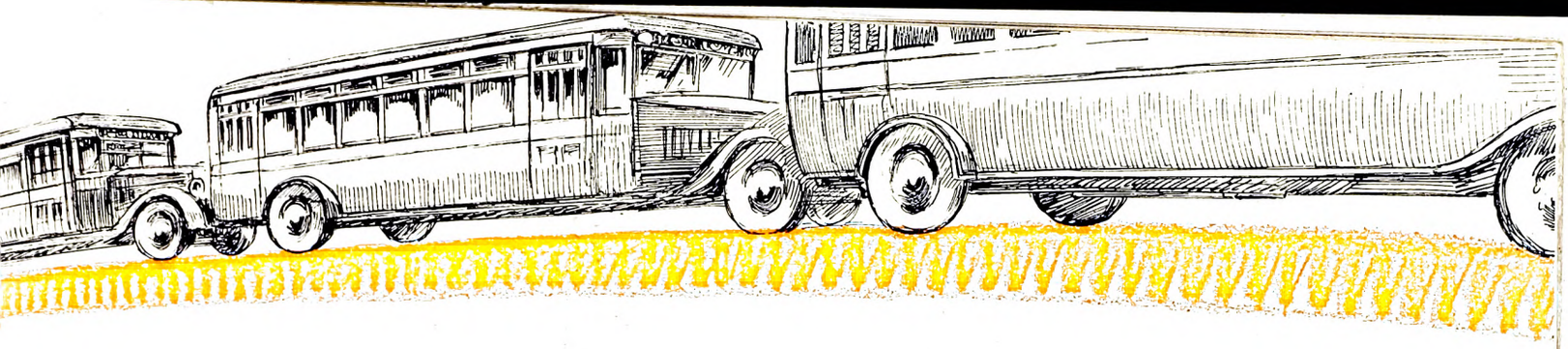

Yellow Coach fleets

of 5 or more coaches

(Compiled to April 30, 1928)

Fleets of 100 or more:

			Coaches	Reorders
1.	Public Service Transportation Company,	Newark, N. J.	849	11
2.	Philadelphia Rural Transit Company,	Philadelphia, Pa.	573	6
3.	Chicago Motor Coach Company,	Chicago, Ill.	436	26
4.	Peoples Motor Bus Company,	St. Louis, Mo.	189	14

Fleets of 50 to 99 Units:

5.	Peoples Motor Coach Company,	Detroit, Mich.	87	7
6.	International Bus Company,	Buffalo, N. Y.	81	5
7.	Connecticut Company,	New Haven, Conn.	74	11
8.	Fifth Avenue Coach Company,	New York, N. Y.	70	6
9.	New England Transportation Company,	New Haven, Conn.	68	4
10.	Shore Line Motor Coach Company,	Gary, Ind.	65	20
11.	Toronto Transportation Commission,	Toronto, Ont., Can.	64	7
12.	Montreal Tramways Company,	Montreal, Que., Can.	60	7
13.	Milwaukee Electric Railway & Light Company,	Milwaukee, Wis.	55	13
14.	Northern Ohio Power & Light Company,	Akron, Ohio	55	8
15.	Washington Railway & Electric Company,	Washington, D. C.	53	15

Fleets of 25 to 49 Units:

16.	Worcester Consolidated Street Railway,	Worcester, Mass.	43	7
17.	Boston & Mine Transportation Company,	Boston, Mass.	42	4
18.	Department of Street Railways,	Detroit, Mich.	41	
19.	Detroit Motorbus Company,	Detroit, Mich.	40	
20.	Washington Rapid Transit Company,	Washington, D. C.	36	2
21.	Indianapolis Street Railway Company,	Indianapolis, Ind.	33	6
22.	Camel City Coach Company,	Winston-Salem, N. C.	32	7
23.	Chester Valley Bus Line, Inc.,	West Chester, Pa.	31	4
24.	North Shore Bus Company, Inc.,	Flushing, L. I., N. Y.	30	13
25.	Atlantic Coast Transportation Company,	Allenhurst, N. J.	29	5
26.	Springfield Street Railway Company,	Springfield, Mass.	29	7
27.	Pittsburgh Motor Coach Company,	Pittsburgh, Pa.	28	5
28.	Colonial Motor Coach Company,	Watertown, N. Y.	27	1
29.	Los Angeles Railway,	Los Angeles, Calif.	26	12
30.	Boston Elevated Railway Company,	Boston, Mass.	25	9
31.	Kansas City Railways,	Kansas City, Mo.	25	1

Fleets of 10 to 24 Units:

32.	Baltimore & Ohio R.R. Company,	Baltimore, Md.	24	3
33.	Blue Bus Company,	Cincinnati, Ohio	24	4
34.	De Camp Bus Lines, Inc.,	Livingston, N. J.	24	8
35.	Illinois Power & Light Company,	Peoria, Ill.	24	6
36.	Southern Pacific Motor Transportation Company,	Portland, Ore.	24	4
37.	Capital Traction Company,	Washington, D. C.	22	7
38.	Gary Street Railways,	Gary, Ind.	22	6
39.	Portland Electric Power Company,	Portland, Ore.	22	5
40.	Arrow Bus Line Interstate Company,	Montclair, N. J.	21	2
41.	White Transit Company,	Wilkes-Barre, Pa.	20	14
42.	British Columbia Rapid Transit Company,	Vancouver, B. C.	19	8
43.	Illinois Power & Light Company,	Galesburg, Ill.	19	6
44.	Northland Transportation Company,	Minneapolis, Minn.	19	3
45.	Houston Electric Company,	Houston, Texas	18	8
46.	New Orleans Public Service Company,	New Orleans, La.	18	3
47.	Midland Trail Transit Company,	Charleston, W. Va.	17	4
48.	Butler-Newark Bus Line, Inc.,	Newark, N. J.	16	2
49.	Danbury Power & Transportation Company,	Danbury, Conn.	16	2
50.	Dominion Power & Transmission Company,	Hamilton, Ont., Can.	16	2
51.	Evanston Bus Company,	Evanston, Ill.	16	6
52.	North Coast Transportation Company,	Tacoma, Wash.	16	4
53.	United Electric Railways Company,	Providence, R. I.	16	2
54.	Wisconsin Power & Light Company,	Madison, Wis.	15	4
55.	Illinois Power & Light Company,	Decatur, Ill.	14	2
56.	Interstate Coach Company,	Spokane, Wash.	14	4
57.	Kentucky Coach Company,	Lexington, Ky.	14	4
58.	Miami Beach Electric Company,	Miami, Fla.	14	
59.	Valley Bus Company,	Cincinnati, Ohio.	14	5
60.	Illinois Power & Light Company,	Quincy, Ill.	13	2
61.	Monongahela West Penn. Public Service Company,	Fairmont, W. Va.	13	5
62.	Topeka Railway Company,	Topeka, Kans.	13	2
63.	United Motor Coach Company,	Des Plaines, Ill.	13	4
64.	Cannonball Transportation Company,	Portsmouth, Ohio	12	2
65.	Community Traction Company,	Toledo, Ohio	12	1

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Fleets of 10 to 24 Units (Continued)

		Coaches	Reorders
66.	Egyptian Transportation Company, Marion, Ill.	12	6
67.	Oklahoma Railway Company, Oklahoma City, Okla.	12	3
68.	Tennessee Transportation Company, Nashville, Tenn.	12	
69.	Brooklyn Bus Corporation, Brooklyn, N. Y.	11	1
70.	Louisville Railway Company, Louisville, Ky.	11	1
71.	San Antonio Public Service Company, San Antonio, Texas	11	3
72.	A. B. & W. Rapid Transit Company, Alexandria, Va.	10	
73.	Atlanta Coach Company, Atlanta, Ga.	10	2
74.	Chicago, North Shore & Milwaukee R.R. Company, Chicago, Ill.	10	
75.	Cleveland Railway Company, Cleveland, Ohio	10	3
76.	Consolidated Cab Company, Ltd., Montreal, Que., Can.	10	
77.	Grove Street Crosstown Bus Line, Irvington, N. J.	10	2
78.	Key System Transit Company, Oakland, Calif.	10	1
79.	New York & Philadelphia Bus Line, Inc., Brooklyn, N. Y.	10	3
80.	Southern Public Utilities Company, Winston-Salem, N. C.	10	

Fleets of 5 to 9 Units:

81.	Denver & Interurban Motor Coach, Denver, Colo.	9	3
82.	East St. Louis & Suburban Railway, East St. Louis, Ill.	9	5
83.	Edwards Motor Transit Company, Inc., DuBois, Pa.	9	4
84.	Erie Coach Company, Erie, Pa.	9	4
85.	Louisiana Electric Company, Inc., Lake Charles, La.	9	1
86.	Rockford & Interurban Railway Company, Rockford, Ill.	9	4
87.	Twin City Motor Bus Company, Minneapolis, Minn.	9	3
88.	Wisconsin Public Service Company, Green Bay, Wis.	8	
89.	Gray Line Motor Tours, Chicago, Ill.	8	2
90.	Municipal Railways, St. Petersburg, Fla.	8	2
91.	Tennessee Electric Power Company, Chattanooga, Tenn.	7	1
92.	Central Passenger Railway Company, Atlantic City, N. J.	7	1
93.	Illinois Power & Light Company, Danville, Ill.	7	1
94.	Kentucky Utilities Company, Inc., Paducah, Ky.	7	4
95.	Logan Valley Bus Company, Altoona, Pa.	7	3
96.	New Jersey Interurban Coach Company, Camden, N. J.	7	
97.	Portland-Seattle Stage Line, Tacoma, Wash.	7	5
98.	Red Bird Transit Company, Charleston, W. Va.	7	1
99.	Schuylkill Transportation Company, Philadelphia, Pa.	7	4
100.	Shawnee-Tecumseh Traction Company, Muskogee, Okla.	7	1
101.	Smith Motor Coach Lines, Memphis, Tenn.	7	4
102.	Tri-City Railway Company, Davenport, Ia.	7	2
103.	West Ridge Transportation Company, Girard, Pa.	7	1
104.	Wyoming Auto Bus Company, Wilkes-Barre, Pa.	6	2
105.	Bay Cities Transit Company, Santa Monica, Calif.	6	1
106.	Consolidated Coach Company, Lexington, Ky.	6	3
107.	Delaware, New Jersey Transportation Company, Bridgeton, N. J.	6	
108.	Durham Public Service Company, Durham, N. C.	6	1
109.	Eastern Massachusetts Street Railway, Boston, Mass.	6	
110.	Eastern Texas Electric Company, Beaumont, Texas	6	
111.	Illinois Power & Light Company, Granite City, Ill.	6	1
112.	Illinois Power & Light Company, Oskaloosa, Ia.	6	
113.	Interstate State Lines, Topeka, Kans.	6	1
114.	Key West Electric Company, Key West, Fla.	6	4
115.	Kingston Consolidated Railway Company, Kingston, N. Y.	6	3
116.	LaCrosse & Southeastern Railway, LaCrosse, Wis.	6	1
117.	London Street Railway Company, London, Ont., Can.	6	4
118.	Madison Railways Company, Madison, Wis.	6	1
119.	Midland Trail Bus Line, Inc., Olney, Ill.	6	
120.	Northwestern Transit Company, Oak Park, Ill.	6	
121.	Philadelphia Suburban Transportation Company, Philadelphia, Pa.	6	
122.	Roanoke Railway & Electric Company, Roanoke, Va.	6	4
123.	Sao Paulo Railway, Light & Power Company, Sao Paulo, Brazil	6	2
124.	Chicago, South Bend & Northern Indiana Railway, South Bend, Ind.	6	2
125.	Springfield Traction Company, Springfield, Mo.	6	1
126.	Sutherland-Tijuana Stages, San Diego, Calif.	5	3
127.	Blue Goose Motor Coach Company, Inc., East St. Louis, Mo.	5	3
128.	Blue Line Stage Company, Walla Walla, Wash.	5	1
129.	Campbell & Cuddy Motor Tours, Boston, Mass.	5	2
130.	Citizens Traction Company, Oil City, Pa.	5	4
131.	Colorado Springs & Interurban R. R., Colorado Springs, Col.	5	4
132.	Empress Taxi & Sightseeing Company, Victoria, B. C., Can.	5	1
133.	Ferguson-Wellston Bus Company, Ferguson, Mo.	5	1
134.	Greyhound Lines, Cincinnati, Ohio	5	
135.	Illinois Power Company, Springfield, Ill.	5	2
136.	Interurban Transportation Company, Alexandria, La.	5	
137.	Kansas Public Service Company, Atchison, Kans.	5	
138.	Metropolitan Coach Company, Chicago, Ill.	5	1
139.	Montgomery Bus Company, Bryn Mawr, Pa.	5	1
140.	Nashville, Chattanooga & St. Louis Railway, Nashville, Tenn.	5	2
141.	Niles Center Bus Line, Niles Center, Ill.	5	
142.	Olympia Grays Harbor Transportation Company, Olympia, Wash.	5	
143.	Pacific Electric Railway Company, Los Angeles, Calif.	5	5
144.	Pennsylvania-Ohio Power & Light Company, Youngstown, Ohio	5	2
145.	Reliable Motor Coach Company, Monticello, N. Y.	5	
146.	Richmond-Washington Coach Company, Alexandria, Va.	5	1
147.	Sunflower Stage Lines, Kansas City, Mo.	5	
148.	Terre Haute, Indianapolis & Eastern Traction Company, Indianapolis, Ind.	5	1
149.	Union Transfer Company, Inc., Nashville, Tenn.	5	
150.	Waer Bus Company, Inc., Easton, Pa.	5	
151.	Western Motor Coach Company, Chicago, Ill.	5	
152.	Yellow Cab Company, Oklahoma City, Okla.	5	

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If there were any better tires, Houston Electric Company's policy of using the best would dictate their use.

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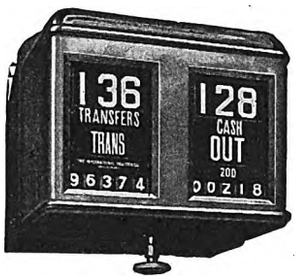

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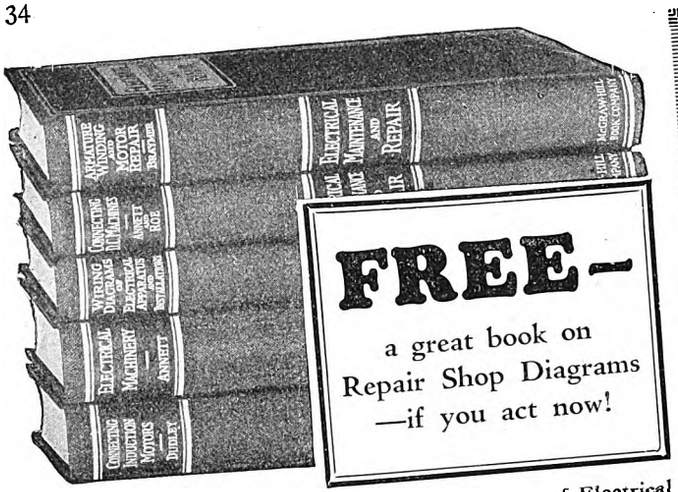

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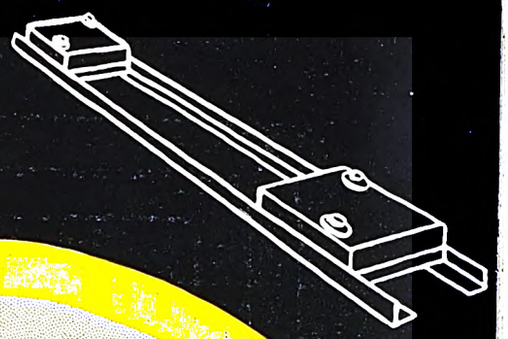
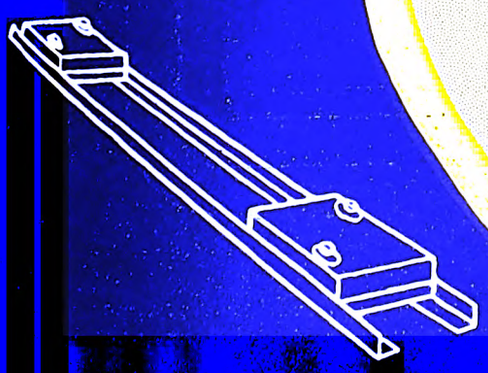


You Have Every Confidence and Assurance WHEN~



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You Realize That—

Dayton Ties

have proved in every test

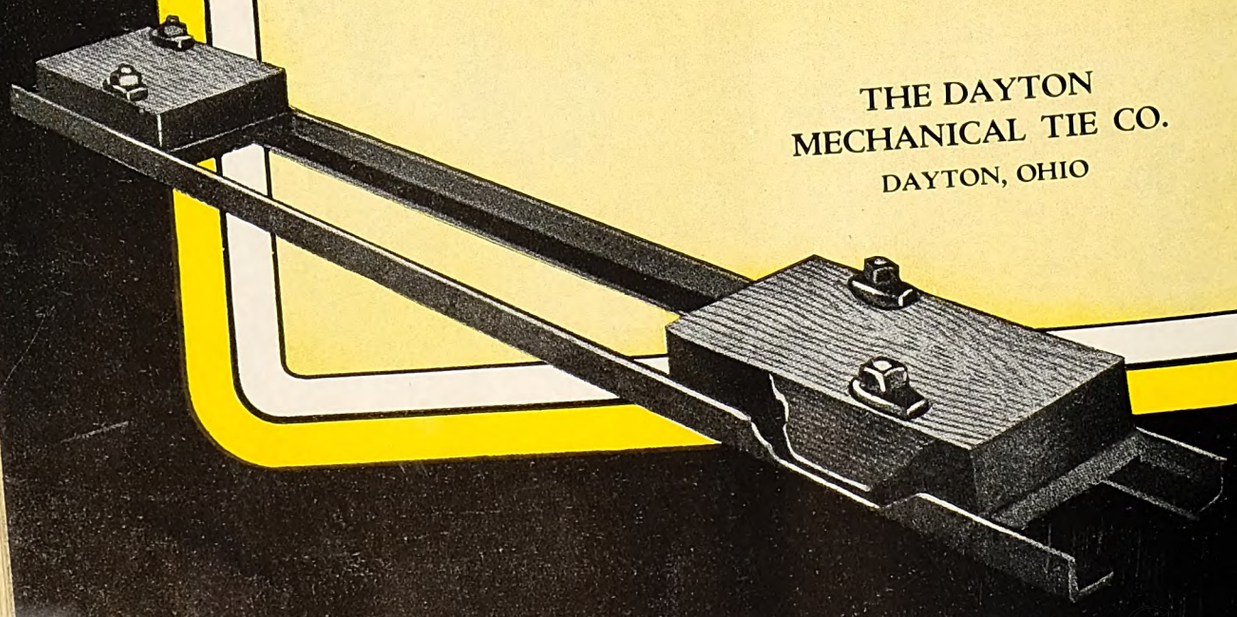
EASE OF INSTALLATION
Because Ties Are Easy To Handle

MINIMUM OF TRACK GANG SUPERVISION
Because Concrete Is The Foundation

MINIMUM MAINTENANCE COST
Because Concrete Is Protected From Disintegration

NO FAILURES ANYWHERE
Because Dayton Ties In Concrete Are Built On Correct and Sound Principle

PLUS
Increasing Recognition and Satisfied Users Throughout Electric Railway Field



THE DAYTON
MECHANICAL TIE CO.
DAYTON, OHIO

SEARCHLIGHT SECTION

USED EQUIPMENT & NEW—BUSINESS OPPORTUNITIES

UNDISPLAYED—RATE PER WORD:

Positions Wanted, 4 cents a word, minimum 75 cents an insertion, payable in advance.

Positions Vacant and all other classifications, 8 cents a word, minimum charge $2.00.

Proposals, 40 cents a line an insertion.

INFORMATION:

Box Numbers in care of any of our offices count 10 words additional in undisplayed ads.

Discount of 10% if one payment is made in advance for four consecutive insertions of undisplayed ads (not including proposals).

DISPLAYED—RATE PER INCH:

1 to 3 inches.....$4.50 an inch
4 to 7 inches..... 4.30 an inch
8 to 14 inches..... 4.10 an inch

Rates for larger spaces, or yearly rates, on request.

An advertising inch is measured vertically on one column, 3 columns—30 inches—to a page.

R.J.

When Writing Your Ad

Provide an indexing or subject word.

Write it as the first word of your ad.

If it is a Position Wanted or Position Vacant ad, make the first word the kind of position sought or offered.

This will assure proper classification in the column.

The right is reserved to reject, revise or properly classify all Want Advertisements.

Proper Classification increases the possibility of Prompt Returns

0301

POSITIONS WANTED

I CAN manage your street railway property regardless of location, size or local difficulties. PW-108, Electric Railway Journal, Tenth Ave. at 36th St., New York.

MANAGER or general superintendent; fifteen years' successful experience. PW-116, Electric Railway Journal, Tenth Ave. at 36th St., New York.

SUPERINTENDENT transportation, wide experience, established successful record, every class of transportation, progressive, efficient, capable getting results under any condition; available short notice; fine references. PW-117, Electric Railway Journal, Guardian Bldg., Cleveland, Ohio.

If you are in charge of employment and need good men—

Or you are an individual seeking a better position—

ADVERTISE *in the Employment Columns of the* SEARCHLIGHT SECTION

AN ENGINEER-ECONOMIST

35 years of age, raised in the practical school of things, has had an unusually broad, practical, executive experience that has contacted practically every basic industry known in the United States, as well as many collateral industries.

His experience has been very broad, practical and thorough in all classes of Public Utilities and has contacted, in a practical manner, all phases of the Petroleum industry.

He is especially well equipped to investigate subjects for financing and place before the principals involved the salients in such a manner as to enable intelligent action.

He is capable of analyzing the causes of poor earnings and prescribe corrective measures and, if necessary, administer the subject until the desired conditions prevail. An organizer and a handler of men. Works harmoniously in any situation. Abreast of important matters of the day and capable of reshaping general, as well as sales, policies in a practical fashion to meet the changing conditions of the day.

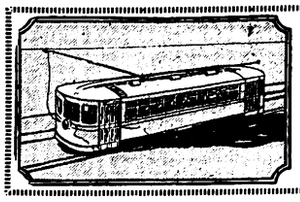
His experience and ability are such as to make his service of large value to financial interests where there are, from time to time, varying problems to be solved.

Will consider connections with the right people and where the future appears to be compensating.

Available in fifteen to thirty days.

Reply care of:

PW-118, Electric Railway Journal, Tenth Ave. at 36th St., New York City



STREET RAILWAY EQUIPMENT

Bought and Sold

Highest Prices for entire Railways and Power Plants

H. E. SALZBERG COMPANY, Inc.

225 Broadway, New York City

"Searchlight" is Quick Action Advertising

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WHAT AND WHERE TO BUY

Equipment, Apparatus and Supplies Used by the Electric Railway Industry with Names of Manufacturers and Distributors Advertising in this Issue

This index is published as a convenience to the reader. Every care is taken to make it accurate, but *Electric Railway Journal* assumes no responsibility for errors or omissions.

Advertising, Streeet Car
Collier, Inc., Barron G.

Air Brakes
General Electric Co.
Westinghouse Tr. Br. Co.

Anchors, Guy
Elec. Service Supplies Co.
General Electric Co.
Ohio Brass Co.
Westinghouse E. & M. Co.

Armature Shop Tools
Columbia Machine Works
Elec. Service Supplies Co.

Automatoc regulators, voltage current & synchronizing
American Brown Boveri Elec. Corp.

Automatic Return Switch Stands
Ramapo Ajax Corp.

Automatic Safety Switch Stands
Ramapo Ajax Corp.

Axles
Bemis Car Truck Co.
Bethlehem Steel Co.
Brill Co., The J. G.
Carnegie Steel Co.
Cincinnati Car Co.
Illinois Steel Co.
Westinghouse E. & M. Co.

Babbitting Devices
Columbia Machine Works

Badges and Buttons
Elec. Service Supplies Co.
Inter. Cash Reg. Co., The

Batteries, Dry
Nichols-Lintern Co.

Bearings, Anti-Friction
Timken Roller Bearing Co.

Bearings and Bearing Metals
Bemis Car Truck Co.
Brill Co., The J. G.
Cincinnati Car Co.
Columbia Machine Works
Westinghouse E. & M. Co.

Bearings, Center and Roller Side
Cincinnati Car Co.
Columbia Machine Works
Stucki Co., A.

Bearings, Roller
Timken Roller Bearing Co.

Bearings, Thrust
Timken Roller Bearing Co.

Bells and Buzzers
Consolidated Car Htg. Co.

Bells and Gongs
Brill Co., The J. G.
Cincinnati Car Co.
Columbia Machine Works
Elec. Service Supplies Co.

Benders, Rail
Railway Trackwork Co.

Bodies, Bus
Brill Co. The J. G.

Boilers
Babcock & Wilcox Co.

Bolts & Nuts, Track
Illinois Steel Co.

Bolts, Case Hardened
Bemis Car Truck Co.

Bond Testers
American Steel & Wire Co.
Electric Service Supplies Co.

Bonding Apparatus
American Steel & Wire Co.
Elec. Service Supplies Co.
Ohio Brass Co.
Railway Trackwork Co.
Una Welding & Bonding Co.

Bonds, Rail
American Steel & Wire Co.
Elec. Service Supplies Co.
General Electric Co.
Ohio Brass Co.
Railway Trackwork Co.
Una Welding & Bonding Co.
Westinghouse E. & M. Co.

Books
McGraw-Hill Book Co.

Brackets and Cross Arms (See also Poles, Ties, Posts, etc.)
Columbia Machine Works
Elec. Ry. Equipment Co.
Elec. Service Supplies Co.
General Electric Co.
Ohio Brass Co.

Brake Adjusters
Brill Co., The J. G.
Cincinnati Car Co.
National Ry. Appliance Co.
Westinghouse Tr. Br. Co.

Brake Shoes
Amer. Br. Shoe & F'dry Co.
Bemis Car Truck Co.
Brill Co., The J. G.

Brake Testers
National Ry. Appliance Co.

Brakes, Brake Systems and Brake Parts
Bemis Car Truck Co.
Brill Co., The J. G.
Cincinnati Car Co.
Columbia Machine Works
General Electric Co.
National Brake Co.
Westinghouse Tr. Br. Co.

Brakes, Magnetic Rail
Cincinnati Car Co.

Brushes, Carbon
General Electric Co.
Morganite Brush Co.
Westinghouse E. & M. Co.

Brushes, Graphite
Morganite Brush Co.

Brushholders
Columbia Machine Works
General Electric Co.

Buses
International Harvester Co.
Studebaker Corp. of America
Twin Coach Corp.
Versare Corp.

Buses, Motor
General Electric Co.

Bus Lighting
National Ry. Appliance Co.

Bushings, Case Hardened and Manganese
Bemis Car Truck Co.
Brill Co., The J. G.
Cincinnati Car Co.
Columbia Machine Works

Cables (See Wires and Cables)

Cambric Tapes, Yellow and Black Varnish
General Electric Co.
Irvington Varn'h & Ins. Co.

Carbon Brushes (See Brushes, Carbon)

Car Lighting Fixtures
Elec. Service Supplies Co.

Car Panel Safety Switches
Consolidated Car Htg. Co.
Westinghouse E. & M. Co.

Car Steps, Safety
Cincinnati Car Co.

Car Wheels, Rolled Steel
Bethlehem Steel Co.

Cars, Dump
Brill Co., The J. G.
Differential Steel Car Co.

Cars, Gas-Electric
Brill Co., The J. G.
General Electric Co.
Westinghouse E. & M. Co.

Cars, Gas, Rail
Brill Co., The J. G.

Cars, Passenger, Freight, Express, etc.
American Car Co.
Brill Co., The J. G.
Cincinnati Car Co.
Kuhlman Car Co., G. C.
Twin Coach Corp.
Wason Mfg. Co.

Cars, Self-Propelled
Brill Co., The J. G.

Castings, Brass Composition or Copper
Cincinnati Car Co.
Columbia Machine Works

Castings, Gray Iron and Steel
Bemis Car Truck Co.
Columbia Machine Works
Standard Steel Works

Castings, Malleable
Timken Roller Bearing Co.

Castings, Malleable & Brass
Bemis Car Truck Co.
Columbia Machine Works

Catchers and Retrievers, Trolley
Elec. Service Supplies Co.
Ohio Brass Co.

Change Carriers
Cleveland Fare Box Co.
Electric Service Supplies Co.

Change Trays
Cincinnati Car Co.

Circuit-Breakers
American Brown Boveri Elec. Corp.
General Electric Co.
Westinghouse E. & M. Co.

Clamps and Connectors for Wires and Cables
Columbia Machine Works
Elec. Ry. Equipment Co.
Elec. Service Supplies Co.
Ohio Brass Co.
Westinghouse E. & M. Co.

Cleaners and Scrapers, Track (See also Snow-Plows, Sweepers and Brooms)
Brill Co., The J. G.
Cincinnati Car Co.

Coil Banding and Winding Machines
Columbia Machine Works
Elec. Service Supplies Co.
Westinghouse E. & M. Co.

Coils, Armature and Field
Columbia Machine Works
General Electric Co.
Westinghouse E. & M. Co.

Coils, Coke and Kicking
Elec. Service Supplies Co.
General Electric Co.
Westinghouse E. & M. Co.

Coin Changers
Johnson Fare Box Co.

Coin Counting Machines
Cleveland Fare Box Co.
Inter. Cash Reg. Co., The
Johnson Fare Box Co.

Coin Sorting Machines
Cleveland Fare Box Co.
Johnson Fare Box Co.

Coin Wrappers
Cleveland Fare Box Co.

Commutator Slotters
Columbia Machine Works
Elec. Service Supplies Co.
Westinghouse E. & M. Co.

Commutators or Parts
Columbia Machine Works
General Electric Co.
Westinghouse E. & M. Co.

Compressors, Air
General Electric Co.
Westinghouse Tr. Br. Co.

Condensers
General Electric Co.
Westinghouse E. & M. Co.

Condensor Papers
Irvington Varn'h & Ins. Co.

Connectors, Solderless
Westinghouse E. & M. Co.

Connectors, Trailer Car
Columbia Machine Works
Consolidated Car Htg. Co.
Elec. Service Supplies Co.
Ohio Brass Co.

Controllers or Parts
Columbia Machine Works
General Electric Co.
Westinghouse E. & M. Co.

Controller Regulators
Elec. Service Supplies Co.

Controlling Systems
General Electric Co.
Westinghouse E. & M. Co.

Converters, Rotary
General Electric Co.
Westinghouse E. & M. Co.

Copper Wire
American Brass Co.
Anaconda Cop. Mining Co.

Copper Wire Instruments, Measuring, Testing and Recording
American Brass Co.
Anaconda Copper Mining Co.

Cord, Bell, Trolley, Register
American Steel & Wire Co.
Brill Co., The J. G.
Elec. Service Supplies Co.
Inter. Cash Reg. Co., The
Roebling's Sons Co., John A.
Silver Lake Co.

Cord Connectors and Couplers
Elec. Service Supplies Co.

Couplers Car
Brill Co., The J. G.
Cincinnati Car Co.
Ohio Brass Co.
Westinghouse Tr. Br. Co.

Cowl Ventilators
Nichols-Lintern Co.

Cranes, Hoists & Lifts
Electric Service Supplies Co

Cross Arms (See Brackets)

Crossing Foundations
International Steel Tie Co.

Crossings
Ramapo Ajax Corp.
Wm. Wharton, Jr. & Co.

Crossings, Frogs & Switches
Ramapo Ajax Corp.
Wm. Wharton, Jr. & Co.

Crossings, Manganese
Bethlehem Steel Co.
Ramapo Ajax Corp.
Wm. Wharton, Jr. & Co.

Crossings, Track (See Track Special Work)

Crossings, Trolley
General Electric Co.
Ohio Brass Co.
Westinghouse E. & M. Co.

Curtains & Curtain Fixtures
Brill Co., The J. G.

Cutting Apparatus
General Electric Co.
Railway Trackwork Co.
Una Welding & Bonding Co.
Westinghouse Tr. Br. Co.

Dealer's Machinery & Second Hand Equipment
Salzberg Co., Inc., H. E.

Derailing Devices (See also Track Work)

Derailing Switches
Ramapo Ajax Corp.

Destination Signs
Columbia Machine Works
Elec. Service Supplies Co.

Detective Service
Wish-Service, P. Edward

Door Operating Devices
Brill Co., The J. G.
Cincinnati Car Co.
Consolidated Car Heating Co.
National Pneumatic Co.

Doors & Door Fixtures
Brill Co., The J. G.
Cincinnati Car Co.
Hale-Kilburn Co.

Doors, Folding Vestibule
National Pneumatic Co.

Drills, Track
American Steel & Wire Co.
Electric Service Supplies Co.
Ohio Brass Co.

Dryers, Sand
Electric Service Supplies Co.
Westinghouse E. & M. Co.

Ears
Columbia Machine Works
Electric Service Supplies Co.
General Electric Co.
Ohio Brass Co.
Westinghouse E. & M. Co.

Electric Grinders
Railway Trackwork Co.

Electrical Wires and Cables
American Steel & Wire Co.
John A. Roebling's Sons Co.

Electrodes, Carbon
Railway Trackwork Co.
Una Welding & Bonding Co.

Electrodes, Steel
Railway Trackwork Cc.
Una Welding & Bonding Co.

Engineers, Consulting, Contracting and Operating
Beeler, John A.
Bibbins, Roland J.
Day & Zimmermann, Inc.
Faile & Co., E. H.
Ford, Bacon & Davis
Hemphill & Wells
Holst, Engelhardt W.
Jackson, Walter
Kelker & DeLeuw
McClelland & Junkersfeld
Richey, Albert S.
Sanderson & Porter
Stevens & Wood
Stone & Webster Co.
White Eng. Corp., The J. G.

Engines, Gasoline
Waukesha Motor Corp.

Engines, Gas, Oil or Steam
Westinghouse E. & M. Co.

Fare Boxes
Cleveland Fare Box Co.
Johnson Fare Box Co.
National Cash Reg. Co.
Perey Mfg. Co.

Fare Registers
Electric Service Supplies Co.
Johnson Fare Box Co.
National Cash Reg. Co.

Fences, Woven Wire & Fence Posts
American Steel & Wire Co.

Fenders and Wheel Guards
Brill Co., The J. G.
Cincinnati Car Co.
Star Brass Works

Fibre and Fibre Tubing
Westinghouse E. & M. Co.

Field Coils (See Coils)

Floodlights
Electric Service Supplies Co.
General Electric Co.

Forgings
Brill Co., The J. G.
Cincinnati Car Co.
Standard Steel Works Co.

Frogs & Crossings, Tee Rail
Bethlehem Steel Co.
Lorain Steel Co.
Ramapo Ajax Corp.
Wm. Wharton, Jr. & Co.

Frogs, Track (See Track Work)

Frogs, Trolley
Electric Service Supplies Co.
General Electric Co.

(Continued on page 40)

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Used and Surplus Equipment

INDIVIDUAL items of used equipment, or surplus new equipment, or complete plants, are disposed of (and found) through advertising in the *Searchlight* Section of this paper.

This is the section which so effectively aided the Government in selling the many millions of dollars worth of surplus material and equipment accumulated during the war without disturbing the market.

"SEARCHLIGHT"

Griffin Wheel Company
410 North Michigan Ave.
Chicago, Ill.

Griffin Wheels
with
Chilled Rims
and
Chilled Back of Flanges
For Street and Interurban Railways

FOUNDRIES:

Chicago	Boston	St. Paul
Detroit	Kansas City	Los Angeles
Denver	Council Bluffs	Tacoma
Cleveland	Salt Lake City	Cincinnati

Arc Weld Rail Bonds
AND ALL OTHER TYPES

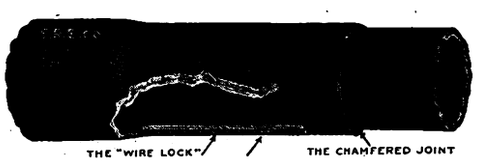
Descriptive Catalogue Furnished

American Steel & Wire Company

CHICAGO, NEW YORK, BOSTON, CLEVELAND, WORCESTER, PHILADELPHIA, PITTSBURGH, BUFFALO, DETROIT, CINCINNATI, BALTIMORE, WILKES-BARRE, ST LOUIS, KANSAS CITY, ST. PAUL, OKLAHOMA CITY, BIRMINGHAM, MEMPHIS, DALLAS, ATLANTA, DENVER, SALT LAKE CITY

EXPORT REPRESENTATIVE: U. S. STEEL PRODUCTS CO., NEW YORK
PACIFIC COAST REPRESENTATIVE: U. S. STEEL PRODUCTS COMPANY, SAN FRANCISCO, LOS ANGELES, PORTLAND, SEATTLE.

ELRECO TUBULAR POLES

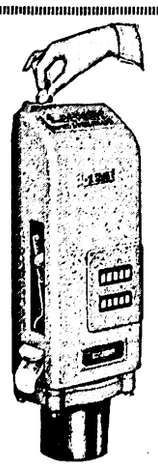


COMBINE

Lowest Cost
Least Maintenance
Lightest Weight
Greatest Adaptability

Catalog complete with engineering data sent on request.

ELECTRIC RAILWAY EQUIPMENT CO.
CINCINNATI, OHIO
New York City, 30 Church Street



Johnson Electric Fare Boxes

and overhead registers make possible the instantaneous registering and counting of every fare. Revenues are increased 1½ to 5% and the efficiency of one-man operation is materially increased. Over 4000 already in use.

Johnson Fare Box Co.
4619 Ravenswood Ave., Chicago, Ill.

Bethlehem Products for Electric Railways

Tee and Girder Rails; Machine Fitted Joints; Splice Bars; Hard Center Frogs; Hard Center Mates; Rolled Alloy Steel Crossings; Abbott and Center Rib Base Plates; Rolled Steel Wheels and Forged Axles; Tie Rods; Bolts; Tie Plates and Pole Line Material.

Catalog Sent on Request

BETHLEHEM STEEL COMPANY, Bethlehem, Pa.

BETHLEHEM

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Ohio Brass Co.
Westinghouse E. & M. Co.

Furnace, Electric
American Brown Boveri Elec. Corp.

Fuses and Fuse Boxes
Columbia Machine Works
Consolidated Car Htg. Co.
General Electric Co.
Westinghouse E. & M. Co.

Gas Electric Drive for Buses
General Electric Co.

Gas Producers
Westinghouse E. & M. Co.

Gates, Car
Brill Co. The J. G.
Cincinnati Car Co.

Gear Blanks
Brill Co., The J. G.
Standard Steel Works Co.

Gear Cases
Chillingworth Mfg. Co.
Columbia Machine Works
Electric Service Supplies Co.
Westinghouse E. & M. Co.

Gears and Pinions
Bemis Car Truck Co.
Columbia Machine Works
Electric Service Supplies Co.
General Electric Co.
Nat'l Ry. Appliance Co.
Nuttall & Co., R. D.

Generators
American Brown Boveri Elec. Corp.
General Electric Co.
Westinghouse E. & M. Co.

Girder Rails
Bethlehem Steel Co.
Lorain Steel Co.

Gongs (See Bells and Gongs)

Grinders, Portable
Railway Trackwork Co.

Grinders, Portable Electric
Railway Trackwork Co.

Grinding Bricks and Wheels
Railway Trackwork Co.

Guard Rail Clamps
Lorain Steel Co.
Ramapo Ajax Corp.

Guard Rails, Tee Rail & Manganese
Ramapo Ajax Corp.
Wm. Wharton, Jr. & Co.

Guards, Trolley
Elec. Service Supplies Co.
Ohio Brass Co.

Harps, Trolley
Columbia Machine Works
Elec. Service Supplies Co.
Nuttall & Co., R. D.
Ohio Brass Co.
Star Brass Works

Headlights
Elec. Service Supplies Co.
General Electric Co.
Ohio Brass Co.

Headlining
Columbia Machine Works

Heaters, Bus
Nichols-Lintern Co.

Heaters, Car (Electric)
Consolidated Car Heating Co.
Gold Car Heat. & Ltg. Co.
Railway Utility Co.
Smith Heater Co., Peter

Heaters, Car, Hot Air and Water
Smith Heater Co., Peter

Heaters, Car Stove
Smith Heater Co., Peter

Helmets, Welding
Railway Trackwork Co.
Una Welding & Bonding Co.

Hoists & Lifts
Columbia Machine Works

Hose, Bridges
Ohio Brass Co.

Hose, Pneumatic
Westinghouse Tr. Brake Co.

Industrial Tractors
International Harvester Co.

Instruments, Measuring, Testing and Recording
American Steel & Wire Co.
General Electric Co.
National Ry. Appliance Co.
Westinghouse E. & M. Co.

Insulating Cloth, Paper and Tape
General Electric Co.
Irvington Varn'h & Ins. Co.
Okonite Co.

Okonite-Callender Cable Co.
Westinghouse E. & M. Co.

Insulating Silk
Irvington Varn'h & Ins. Co.

Insulating Varnishes
Irvington Varnish & Ins. Co.

Insulation (See also Paints)
Electric Ry. Equipment Co.
Elec. Service Supplies Co.
Irvington Varn'h & Ins. Co.
Okonite Co.
Okonite-Callender Cable Co.
Westinghouse E. & M. Co.

Insulation Slots
Irvington Varn'h & Ins. Co.

Insulator Pins
Elec. Service Supplies Co.
Ohio Brass Co.

Insulators (See also Line Materials)
Elec. Ry. Equipment Co.
Elec. Service Supplies Co.
General Electric Co.
Irvington Varn'h & Ins. Co.
Ohio Brass Co.
Westinghouse E. & M. Co.

Jacks (See also Cranes, Hoists and Lifts)
Columbia Machine Works
Elec. Service Supplies Co.

Joints, Rail (See Rail Joints)

Journal Boxes
Bemis Car Truck Co.
Brill Co., The J. G.
Cincinnati Car Co.

Lamp Guards and Fixtures
Elec. Service Supplies Co.
Westinghouse E. & M. Co.

Lamps, Arc & Incandescent (See also Headlights)
General Electric Co.
Westinghouse E. & M. Co.

Lamps, Signal and Marker
Elec. Service Supplies Co.
Nichols-Lintern Co.

Lanterns, Classification
Nichols-Lintern Co.

Letter Boards
Cincinnati Car Co.

Lighting Fixtures, Interior
Electric Service Supplies Co.

Lightning Protection
Elec. Service Supplies Co.
General Electric Co.
Westinghouse E. & M. Co.

Line Material (See also Brackets, Insulators, Wires, etc.)
Electric Ry. Equipment Co.
Elec. Service Supplies Co.
General Electric Co.
Ohio Brass Co.
Westinghouse E. & M. Co.

Locking Spring Boxes
Lorain Steel Co.
Wm. Wharton, Jr. & Co.

Locomotives, Diesel Electric
American Brown Boveri Elec. Corp.

Locomotives, Electric
American Brown Boveri Elec. Corp.
Cincinnati Car Co.
General Electric Co.
Westinghouse E. & M. Co.

Manganese Steel Guard Rails
Ramapo Ajax Corp.
Wm. Wharton, Jr.. & Co.

Manganese Steel Castings
Bemis Car Truck Co.
Lorain Steel Co.

Manganese, Steel, Special Track Work
Bethlehem Steel Co.
Wm. Wharton, Jr. & Co.

Manganese Steel Switches Frogs and Crossings
Bethlehem Steel Co.
Lorain Ajax Corp.
Ramapo Ajax Corp.
Wm. Wharton, Jr. & Co.

Mirrors, Inside & Outside
Cincinnati Car Co.

Motor Buses. (See Buses)

Motors, Electric
General Electric Co.
Westinghouse E. & M. Co.

Motor, Generators & Controls for Electric Buses
General Electric Co.

Motor, Generator Sets
American Brown Boveri Elec. Corp.

Motorman's Seats
Brill Co., The J. G.
Cincinnati Car Co.
Elec. Service Supplies Co.

Nuts and Bolts
Bemis Car Truck Co.
Cincinnati Car Co.

Omnibuses (See Buses)

Oxy-Acetylene (See Cutting Apparatus)

Packing
Westinghouse Tr. Brake Co.

Paints and Varnishes (Insulating
Elec. Service Supplies Co.
Irvington Varn'h & Ins. Co.

Paints & Varnishes, Railway
National Ry. Appliance Co.

Pickup, Trolley Wire
Elec. Service Supplies Co.
Ohio Brass Co.

Pinion Pullers
Elec. Service Supplies Co.

Pinions (See Gears)

Pins, Case Hardened
Bemis Car Truck Co.

Pins, Case Hardened, Wood and Iron
Ohio Brass Co.
Westinghouse Tr. Brake Co.

Pipe Fittings
Standard Steel Works
Westinghouse Tr. Brake Co.

Planers (See Machine Tools)

Plates for Tee Rail Switches
Ramapo Ajax Corp.

Pliers, Rubber Insulated
Elec. Service Supplies Co.

Pole Line Hardware
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Switches, Track (See Track Special Work

Tampers, Tie
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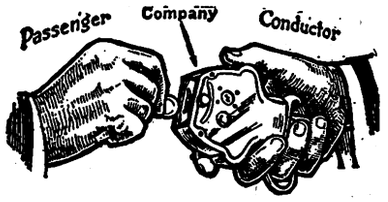

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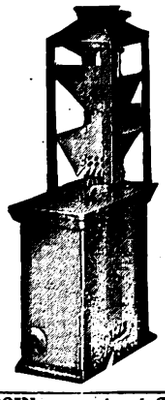

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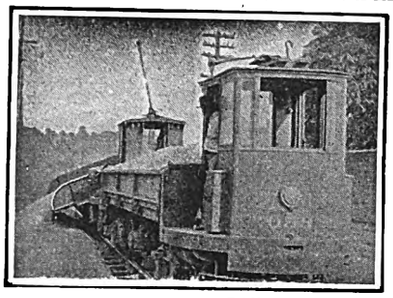

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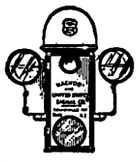

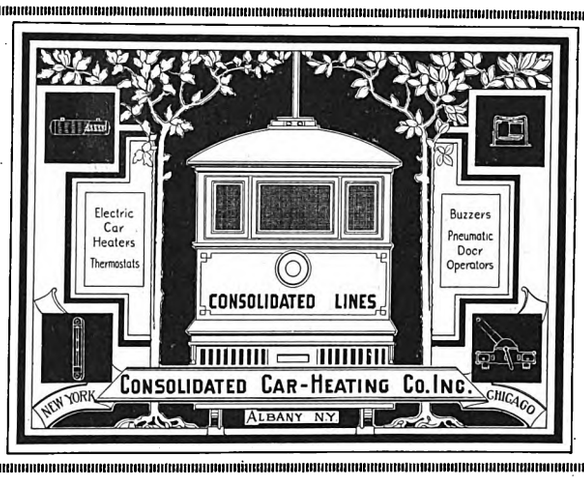

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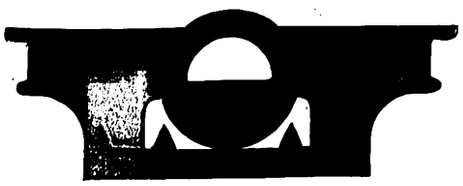

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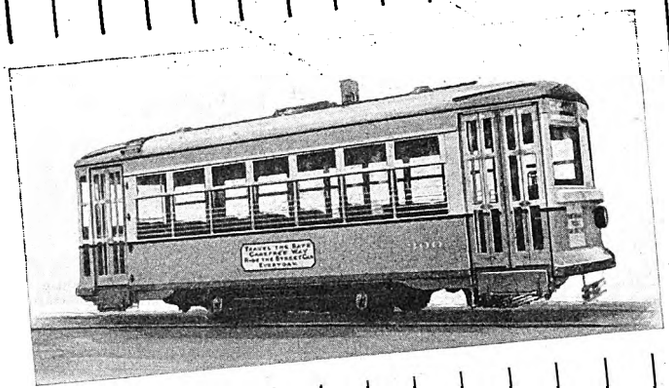

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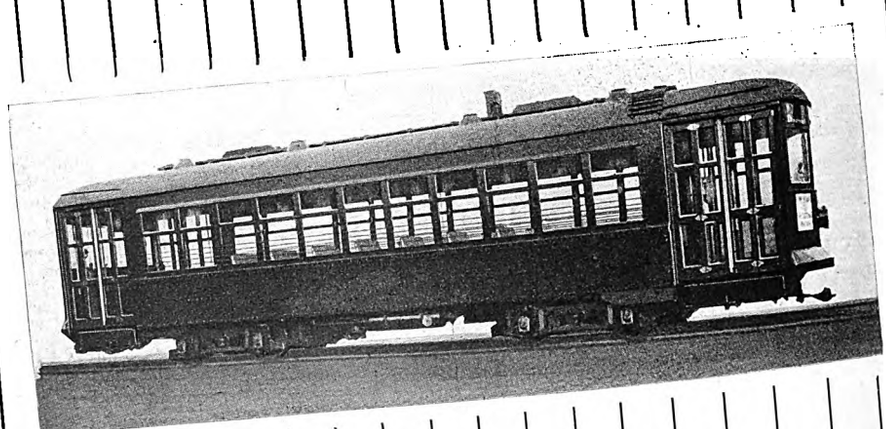

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Brill Modern Cars

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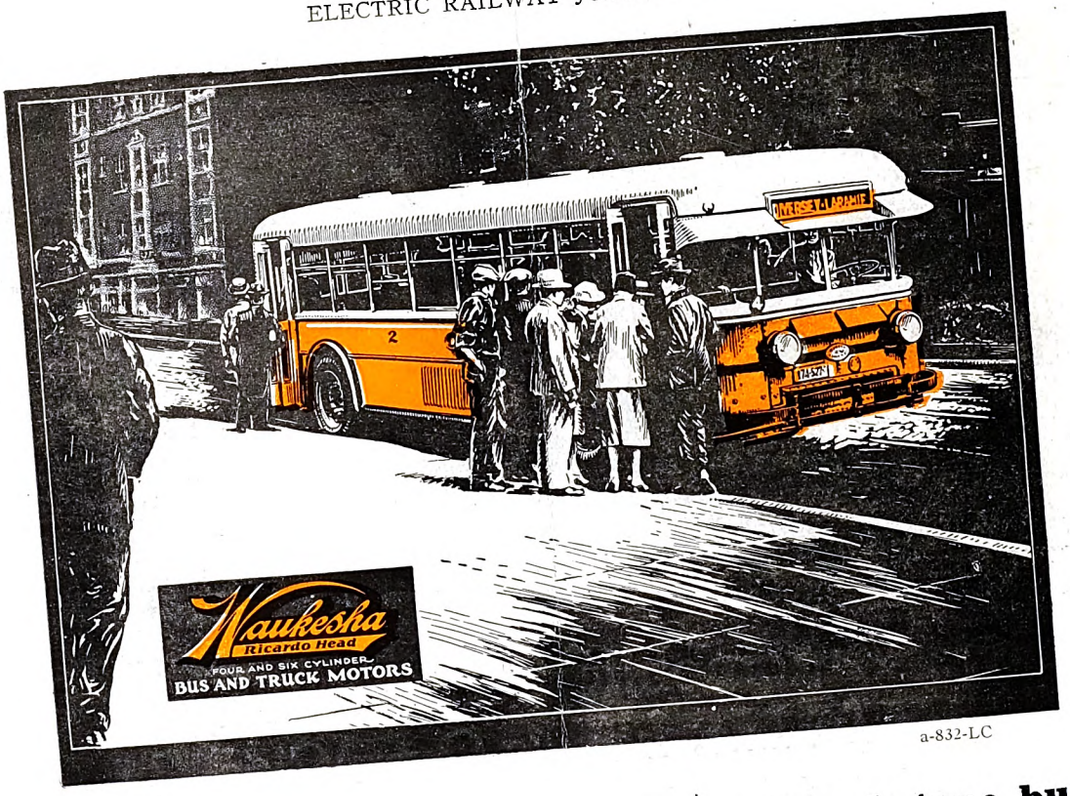

a-832-LC

Chicago's Standard Bus

"The new Twin Coach type bus---has quick get-away because of its adequate power facilities and has added reliability of service due to its twin motors. These advantages over the older type buses influenced the Chicago Surface Lines in adopting the Twin Coach as its standard for feeder bus service," so Guy A. Richardson, Vice-President Chicago Surface Lines, says.

Frank R. Fageol, father of the "Safety Coach," and builder of the "Twin Coach," wanted the best that could be obtained in a simple, high-powered, economical and long-lived engine for these city-service buses. That is why special Waukesha six-cylinder engines, with genuine "Ricardo Heads," were chosen.

A-849-LC

AUTOMOTIVE EQUIPMENT DIVISION

WAUKESHA MOTOR COMPANY

Waukesha Wisconsin

Eastern Sales Offices *Eight W. 40th Street* *New York City*

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